

# INCOSE PAPER EVALUATION CRITERIA

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## Paper Evaluation Criteria

Besides the general requirements that the paper shall not be used for the promotion of any commercial product or interest, and that the paper shall not be used to promote or voice an opinion on political or religious matters, presented concepts should be usable, advance SE knowledge, have supporting information sufficient to enable an end user to assess the efficacy of a stated position, and be sufficiently complete to understand the paper's use and applicability.

Insight into each of the Evaluation Criteria is presented in the following sections to assist the author(s) in achieving high quality of the submitted draft paper, thus increasing the likelihood of acceptance.

### 1. Content advances the knowledgebase for, or the practice of, systems engineering

This evaluation criterion can be summarized as "Does this paper provide usable systems engineering information to novice or seasoned practitioners, or insight to enable and advance new concepts in order for INCOSE to improve its application of systems engineering?" This may consist of:

- insights into the development, application, or evolution of existing or new systems processes
- domain specific applications of generic systems engineering principles, concepts, processes, or methods
- the gathering and synthesis of documentation which enables an expanded view or different insight into existing applications of systems engineering
- methods of analysis or modelling of an initial or expanded set of acquirer requirements
- techniques for applying existing systems engineering concepts – templates, management insights, automation of specific systems engineering tasks or processes
- refinement of existing principles, concepts, techniques, etc concerning systems engineering
- articulation of new principles, concepts, techniques, etc. concerning systems engineering
- innovative approaches or innovative fields of applications for systems principles
- practicable experience and insights into the selection, implementation, and use of systems engineering tools (as opposed to thinly disguised advertisements or campaigns for a specific toolset)
- insights and techniques for applying new systems engineering related standards to a project
- research or recorded observations which indicate the need for new processes, techniques, or understandings in the application of systems engineering
- specific techniques for measuring performance of a project against the published technical plan, requirements, and schedule
- specific techniques for assessing the efficacy of an existing, modified, or new systems engineering process using capability maturity or assessment models

- breakthroughs in obtaining executive management support and understanding of the need to apply systems engineering principles (and how these breakthroughs were achieved)

However, the following features of a paper would be inappropriate:

- The only purpose of the paper is to train the audience in the application of a proprietary tool. While potentially useful, such a paper should be presented in a special session associated with the vendor exhibits.
- The purpose of the paper is to be a review of and reference for any part or all of systems engineering. While such reviews and annotated bibliographies are very useful, they are not suitable for presentation to an audience, but could be published in a journal.
- The paper represents a clear case of conflict of interest, in that the author voices an opinion on a product in which he or she has a commercial interest.

It is implicit in this criterion that the subject matter of the paper is concerned with, or has a strong link to, systems engineering. Papers that are only concerned with e.g. software development or project management are not acceptable.

It is further implicit in this criterion that the material should not have been previously presented to INCOSE, and if it has been previously presented anywhere, this should be noted by giving the corresponding references.

## 2. Content is substantive

This evaluation criterion element stresses the substance of the case presented; i.e., of having enough detail to provide value. Typically, substantive products would provide answers to the following types of questions:

- What are the specific methods used to effectively accomplish the product purpose - a sharing on the specifics of 'how' rather than just 'what'?
- How is the product addressing challenges such as commonality; increasing the use of COTS; working globally, etc.?
- What are the predictors for success - e.g., can we predict the goodness of architecture during the concept/design phases?
- How do we apply systems engineering principles to the product and practices across both commercial and government enterprises, and how can the practices and lessons learned from both enterprise views improve the SE product under review?
- How does Systems Engineering need to evolve to accommodate the types of systems and ways of working for the next decade?
- How are we educating System Engineers?
- How are we maintaining technical vitality of the SE workforce?

- What constitutes an innovation in systems engineering practices?
- Can we share the case studies relating to the application of systems engineering – how we did things, how things worked out; what we would do differently on the next project?
- What are the Working Groups of INCOSE investigating, what solutions or lessons have been agreed to, and are they usable for the paper under review?
- What are the significant achievements captured in this paper?

A substantive paper on tools use would provide insight into how to adapt a given tool to a specific process or project need, or specifics on how to use the tool to reduce the time required for validation of acquirer, rather than extol its virtues or appeal. Or such a paper might explain in depth the criteria and specific tasks an organization followed in accomplishing an in-house assessment of the adequacy of its processes. Such a paper provides insight that enables you to understand the "why" behind the knowledge or the "how" of implementing the imparted knowledge.

### 3. Content is logical

Such a paper will present its case to the reader such that the reader will be able to follow the reasoning and not be subjected to inexplicable jumps and gaps; i.e.:

- Does each argument of position follow a prior set of facts?
- Are conclusions consistent with the defined premises, or is a leap of faith required?
- When a reading of the paper is complete, do you understand how the paper was organized?

### 4. Content assertions are backed by supporting data

Assertions, conclusions, positions on issues presented, etc. are backed up with supporting data. The paper should not simply state an assertion without providing suitable rationale, references and documented results or events.

*For example, a paper should not simply state that a new process reduced time to market by 85%. Instead, it might state that this reduction was achieved by executive management electing to apply the "six sigma" team concepts and supporting that decision with effective team training from external specialists, providing the necessary resources to select and execute projects, and selecting leaders known for their vision and completion skills*

### 5. Content is effectively conveyed and key concepts are integrated

An excellent paper will exhibit clarity of purpose, enabling the reader to easily comprehend the intent and conclusions after one reading, to understand its progression from one point to another to its conclusion, and to be able to visualize the "whole" as well as the individual pieces (and their interrelationships) that make up the whole.

- Are the key points easily comprehended?
- Are the conclusions clear and believable?
- Are the key concepts integrated throughout the paper?

### Procedure for the reviewers:

- a. Read or refresh the reading of the review criteria to ensure an understanding of what to review against.
- b. Access the Paper Review Database, and bring up one of the assigned papers on the screen, or download and print.
- c. Read the paper through quickly to get an understanding of its objective and structure. An exceptional quality paper will enable the reader to easily comprehend the intent and conclusions, to understand its progression from one point to another, and to be able to visualize the "whole" as well as the individual pieces (and their interrelationships) that make up the whole.
- d. Re-read more thoroughly, jotting down comments.
- e. Grade each of the five Evaluation Criteria using the following scale:  
1 = Poor, 2 = Fair, 3 = Good, 4 = Very Good, and 5 = Exceptional.
- f. Assess overall contribution of the paper to a symposium and select one of the following recommendations: Accept as is, Accept with updates, or Reject; the latter two recommendations require the reviewer to enter a corresponding justification.
- g. Enter constructive comments. Limit comments to what it would take to make the paper a better paper. Opinions and conclusions of the reviewer, if a disagreement, should not be captured, unless made as a constructive "have you considered" statement. Comments might include examples such as "the section on xyz should be shortened" or "the section on abc should be expanded to include a more detailed explanation and rearrangement. I suggest...". Be specific. Words of encouragement such as, "This is a great paper; looking forward to hearing more about the subject" are always welcome when deserved.

### Note:

It is not prudent to rate a paper highly if it is still in outline form. Finalisation of papers, although the intent of the author to update is present, often does not occur due to unforeseen time constraints on the author. Ratings should reflect the paper in the form reviewed, even if the outline or rough draft has strong potential.