

1.0 INTRODUCTION

The primary purpose of this document are to:

1. Assist providers of systems engineering service in establishing their capability and describing this capability in proposals.
2. Assist system acquisition activities in describing the needed systems engineering (SE) elements in statement of work (SOW).

This document defines a concise system approach for systems engineering processes (SEPs) for an organization or project. The document requires: establishing and implementing a structured, disciplined, and documented SE effort incorporating the SEP; multi-disciplinary teamwork; and the simultaneous development of the products and processes needed to satisfy user needs. The SEP is defined generically to facilitate broad application and defines the requirements for technical reviews. The tasks in this document provide a methodology for evaluating progress in achieving system objectives. A comprehensive, structured, and disciplined approach for new system product and process developments, for upgrades, for modifications, and for engineering efforts conducted to resolve problems in fielded systems in all acquisition and support phases is also documented.

1.1 Scope

This guide concentrates on systems engineering processes and basic activities. Eight process areas (PAs) and eighty-five basic activities (BAs) are all focused on engineering activities. The subjects of project management and organizational improvement are left to other related handbooks and standards described in Appendix E.

This guide is applicable to the tasking of technical efforts in support of advancing and developing new technologies and applications. The concepts presented apply to large and small-scale systems and projects; to single or multiple procurements; and to new acquisition and upgrade and modernization programs. The document is applicable to systems, regardless of composition, including those that are integrated from diverse elements, those that are hardware dominant, and those that are software dominant. A program manager will use this document to tailor an effective and efficient program implementation. The concepts and formats presented can be expanded to accommodate large scale efforts.

The SEP is applied iteratively throughout the system life cycle to translate stated problems into design requirements to provide an integrated system solution consisting of people, products, and processes with the capability to satisfy customer needs.

1.2 Key Roles in Tasking

Throughout this document three key role players are assumed and defined in the following subsections.

1.2.1 Acquirer

The "Acquirer" of systems and related SE efforts is the customer. This organization (or person) is the customer in the sense that it represents the systems user and controls the resources such as funding for the SE on a contract or funded tasking statement.

1.2.2 Provider

The "Provider" is the organization that performs the technical SE effort in accordance with a contract or funded tasking statement.

1.2.3 Chief Engineer

A lead Systems Engineer is referred to in this document as the "Chief Engineer." This person or office is designated as the entity responsible for integrating the total technical efforts of all providers of engineering effort. The chief engineer may be a member of the acquirers organization, the providers organization, or a third independent organization which coordinates and serves the overall interests of the project.

1.3 Document Roadmap

Section 2 provides a general description of SE tasks, presenting the SEPs in terms of tasking statements.

Problems are normally expressed in terms of needs for new developments and modifications or as deficiencies in operating, supporting, or providing training for fielded items. Performance-based requirements and alternative solutions to problems are iteratively defined and refined. Solutions may include existing, limited-development, or emerging technologies that have transitioned from the technology base to product and process applications.

Historically, the acquirer prepared a statement of work (SOW) or specification which detailed both the "what" and "how" required of the providers. The modern acquisition reform related practice is for the acquirer to document the "what" in terms of objectives and for the provider to document the details of both requirements and processes in a deliverable document. This document, which may be a specification, plan, SOW or tasking statement is then put under content configuration control and referenced as the official details of the contract. The term Systems Engineering Tasking Description (SETD) is used throughout this handbook to capture this idea.

Section 3 provides an overview of how SE tasks are tailored to support the product and process development.

Section 4 provides further guidance for the intended use of this document to support program initiatives. Throughout system development, a comprehensive, responsive verification effort is implemented to ensure that individual component and overall system design satisfies requirements. Progressive verification from individual pieces of the solution (system elements) up through complete system integration is required.

Appendices A, B, and C provide guidance for developing SE capability and documentation to support proposals concerning the SEPs. Appendix D provides an extensive glossary of terms that are used throughout this document. Appendix E describes related handbooks and standards.

This page intentionally left blank.