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Processes for Engineering a System

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ELECTRONIC INDUSTRIES ALLIANCE

GOVERNMENT ELECTRONICS AND
INFORMATION TECHNOLOGY ASSOCIATION
ENGINEERING DEPARTMENT



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Processes for Engineering a System

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Foreword

This Standard is intended to enable an enterprise to strengthen its competitiveness in global markets by engineering and producing quality systems, and by delivering its products on time at an affordable price or cost. The focus, therefore, is on conceptualizing, creating, and realizing a system and the products that make up a system.

This Standard was developed as a joint project of the Electronic Industries Alliance (EIA) and the International Council on Systems Engineering (INCOSE). This effort was chartered by the G-47 Systems Engineering Committee of EIA and has been designated as Project PN-3537. This Standard has been approved by the EIA Engineering Department Executive Committee.

Intended uses of this Standard include

- a) benchmarking by an enterprise against the requirements of this Standard for engineering a system, or portion thereof;
- b) preparing enterprise standards, policies, and procedures for engineering a system;
- c) developing lower-tier industry- or domain-specific process standards;
- d) developing process capability and assessment models;
- e) establishing terminology and concepts for better communications;
- f) developing training and education curricula;
- g) preparing plans for actual development of a product.

Use is not limited to specific disciplines, industry sectors, or technology domains.

To provide each enterprise with the greatest degree of flexibility for adapting to changing environments while maintaining the integrity of adopted processes, this Standard

- a) limits the set of required processes to those directly related to the technical aspects of engineering systems;
- b) defines representative tasks associated with each process;
- c) includes the relevant information flows and interactions with enterprise and project entities.

This Standard is intended to define “what to do” with respect to the processes for engineering a system. ANSI/EIA-731, *Systems Engineering Capability*, provides a capability model and assessment method as a basis and means for determining “how well” the processes in ANSI/EIA-632 are defined and implemented.

This Standard is consistent with ISO 9000 in that it provides processes that can be adopted by enterprises for engineering systems.

Annex A is normative. Annexes B through G are informative.

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Introduction

Background

In June 1994, a working group of industry associations, the International Council on Systems Engineering (INCOSE), and the Department of Defense developed an interim standard for the engineering of systems. This effort was led by the G-47 Committee on Systems Engineering of the Electronic Industries Alliance (EIA). EIA/IS 632 was intended to provide a standard for use by commercial enterprises, as well as government agencies and their development contractors.

In April 1995, a formal working group was established under Project PN-3537 and with EIA and INCOSE sponsorship to generate and release this full Standard. The joint working group decided that it would best serve U. S. industry to develop a “top-tier” standard applicable across all industry sectors and technology domains. As a result, the contents of this Standard are an abstraction of the essential features of the engineering practices described in the interim version of this Standard.

Contents of this Standard

This Standard defines a systematic approach to engineering or reengineering a system, incorporating best practices that have evolved during the second half of the twentieth century. The defined approach has three premises:

- a) A system is one or more end products and sets of related enabling products that allow end products, over their life cycle of use, to meet stakeholder needs and expectations;
- b) Products are an integrated composite of hierarchical elements so integrated as to meet the defined stakeholder requirements;
- c) The engineering of a system and its related products is accomplished by applying a set of processes to each element of the system hierarchy by a multidisciplinary team of people who have the requisite knowledge and skills.

The systematic approach of this Standard is applicable for: (1) completing corrective actions, (2) making refinements, (3) developing derivatives, (4) producing modifications, and (5) updating existing products, (6) creating and realizing new systems, and (7) allowing for the safe and cost-effective disposal (retirement) of a system. This approach is incrementally applied in an engineering life cycle framework that can be implemented during any one or more phases of an enterprise-based life cycle (for example, during production, operations, support, or disposal).

Voluntary Compliance

Adoption of this Standard is intended to be entirely voluntary, within the discretion of individual enterprises or other individual organizations.