AIAA

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Recommended Practice

Recommended Practice for Parts Management

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Sponsored by

American Institute of Aeronautics and Astronautics

Abstract

This AIAA standard establishes a parts management approach that is consistent with today's business environment. This Recommended Practice, as viewed by industry and government, is a shift in business philosophy from a controlled approach to a performance-based process. The dynamic growth of the commercial market for electronic parts as well as corresponding decrease in aerospace and defense have caused the government and industry to seek alternative methods of managing parts. To develop a solution to this complex problem, industry and government teamed to develop this Recommended Practice for mitigating potential problems/risks. The result of this team effort is a non-government standard (NGS) on Parts Management. The basic strategy employed by this document is to understand and manage risk as early as possible in program life cycle.

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Foreword

This Recommended Practice for Parts Management has been reviewed and approved by the American Institute of Aeronautics and Astronautics as part of its Standards Program. In 1995, an industry organized consortium took the initiative to respond to a critical need and then approached the AIAA to achieve broader circulation and demonstration of consensus. In 1996, the document was proposed as an ISO International Standard within ISO TC20/SC14, Space Systems and Operations. Publication of that effort is imminent, but the scope is restricted to electrical, electronic, and electromechanical (EEE) parts used in space systems. This 2001 revision draws from the improvements made during the international discussions, but maintains the broad application to mechanical parts, as well as EEE and in a broader industry setting. The data in Section 1 has also been brought up-to-date.

The Department of Defense (DoD) has adopted this Recommended Practice informally through its acquisition reform program. The challenge to the aerospace and defense industry during the on-going, changing business environment still calls for the use of performance and commercial specifications with a baseline that ensures the performance, reliability, cost competitiveness, life-cycle projections, on-time delivery, manufacturing process controls, and long-term viability of parts and materials.

The original industry/government Part Acquisition Reform Team (PART) that developed this performance-based Recommended Practice to replace military specifications for parts and materials management is maintaining it.

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The AIAA Reliability Committee on Standards, including the Part Acquisition Reform Team, composed of the following individuals, approved the revision in April 2001:

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1 Introduction

1.1 Scope

This Recommended Practice is a collection of techniques for managing parts programs. It addresses the preferred program elements adopted by the aerospace industry (military, civil, and commercial) for parts management. The approaches cover electrical, electronic, and electromechanical (EEE) and mechanical parts.

This document is written in general terms as a baseline for implementing a parts management program. It may be cited as a baseline within a statement of work and/or for assessing proposals and contractor performance. All levels of contractual relationships (acquiring activities, primes, subcontractors, and suppliers) may use this document. EEE and mechanical parts, together with materials and processes, form one of seventeen critical processes involved in the various phases of every program.

1.2 Purpose

The purpose of this Recommended Practice is to assist contractors in the development of a parts management plan. The user is responsible for integrating the elements of this Recommended Practice appropriate to the program.

1.3 Background

Diminishing sources of military and space parts are leading to the use of commercial parts which will result in substantial nonrecurring engineering (NRE) cost increases in current and future programs. The cost increases are incurred due to the need to establish a new reliability baseline through design, redesign, or modification of current systems, analysis, and test of systems and subsystems utilizing these commercial parts. The availability of radiation-tolerant/hardened parts is most at risk.

The trend of technology obsolescence and diminishing manufacturing sources of military and radiation-hardened parts, materials, and equipment has been rapidly escalating due to a relative decline in the defense market coupled with the explosive growth of the commercial marketplace. Within the microcircuit industry, for example, military sales have declined from 17 percent to less than 1 percent of the total market (Figure 1). This shrinking market has prompted an increase in the number of products discontinued each year (Figure 2). As a result, industry has increasingly focused attention on issues of parts obsolescence affecting current development and production programs. Life cycles of new microcircuit technologies are rapidly shrinking (Figure 3) and, in some cases, they are shorter than the time it takes to get a program through development into production. See annexes A, B, C, D, E, and F for more information.