AIAA
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Standard

Mass Properties Control for Space Systems

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Sponsored by

American Institute of Aeronautics and Astronautics

Approved

1 December 2006

Abstract

This standard defines terminology and establishes uniform processes, procedures, and systematic methods for the management, control, monitoring, determination, verification, and documentation of mass properties during the design, development and operational phases of space systems, including their components and subsystems. This standard applies to space vehicles, upper stage vehicles, injection stages, satellite payloads, reentry vehicles, launch vehicles, and ballistic vehicles. This standard is intended to be used as a reference for the development of a project-specific, contractually required mass properties control plan.

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Foreword

This document is intended as a guide for developing mass properties control plans, and may also be used to establish requirements during preparation of acquisition contract and program specific documents.

This standard combines MIL-STD-1811, MIL-HDBK-1811 Handbook for Mass Properties Control for Space systems, and MIL-M-38310B Mass Properties Control Requirements for Missile and Space systems. It contains proven methods and lessons learned for effective mass properties control, combines tools necessary for timely evaluation of program mass properties, and enables early decision making regarding possible design changes.

The primary objective of this standard is to provide effective and uniform processes for space system mass properties control, analysis, verification, data management, and documentation. It is intended to be as comprehensive as practical and will be periodically updated to incorporate advances and innovations.

The individuals that participated in the consensus development process with greater than 20% attendance are listed below. Members of the Technical Editing Subcommittee are indicated with an asterisk. Special recognition is given to William Kruse, Richard Sugiyama, and Louis Yang, who wrote the Technical Operating Report that formed the basis of this document.

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The above consensus body approved this document in November 2006.

The AIAA Standards Executive Council (Mr. Amr ElSawy, Chairman) accepted the document for publication in December 2006.

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1 Scope

This standard defines terminology and establishes uniform processes, procedures, and systematic methods for the management, control, monitoring, determination, verification, and documentation of mass properties during the design, development and operational phases of space systems, including their components and subsystems. This standard applies to space vehicles, upper stage vehicles, injection stages, satellite payloads, reentry vehicles, launch vehicles, and ballistic vehicles. This standard is intended to be used as a reference for the development of a project-specific, contractually required mass properties control plan.

2 Tailoring

When viewed from the perspective of a specific program or project context, the requirements derived in this Standard may be tailored to match the actual requirements of the particular program or project. Tailoring of requirements shall be undertaken in consultation with the procuring authority where applicable.

NOTE Tailoring is a process by which individual requirements or specifications, standards, and related documents are evaluated and made applicable to a specific program or project by selection, and in some exceptional cases, modification and addition of requirements in the standards.

3 Vocabulary

3.1 Acronyms and Abbreviated Terms

AIAA	American Institute of Aeronautics and Astronautics
ANSI	American National Standards Institute
ATP	Authorization to Proceed
CAD	Computer Aided Design
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CFE	Customer Furnished Equipment
CM	Center of Mass
CR	Customer Reserve
DID	Data Item Description
ECLSS	Environmental Control and Life Support System
FEM	Finite Element Model
GSE	Ground Support Equipment
I&T	Integration and Test
LV	Launch Vehicle
MGA	Mass Growth Allowance
MIL-STD	Military Standard