

ANSI/AIAA
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Guide

Guide for the Preparation of Operational Concept Documents

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American National Standard

Guide for the Preparation of Operational Concept Documents

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Abstract

Military and NASA standards require that information that relates to system operational concepts be prepared in support of the specification and development of systems. There are Data Item Descriptions (DIDs) which describe the format and content of the information. This AIAA Guide describes which types of information are most relevant, their purpose, and who should participate in the effort. It also provides advice regarding effective procedures for generation of the information, and how to document it. Finally, this AIAA Guide provides an example of how the described process was applied to support the development of a major system within NASA.

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CONTENTS

	Foreword.....	v
1.0	Introduction.....	1
1.1	Purpose	1
1.2	Scope.....	1
2.0	Operational Concept Description.....	1
2.1	Purpose of the OCD Technique	1
2.2	Overview of the OCD's Role.....	1
2.2.1	Definition of <i>System</i>	1
2.2.2	Perspectives of OCD Application	2
2.3	Intended Audience.....	3
2.4	When to Generate an OCD.....	4
2.5	OCD Maintenance.....	4
3.0	Background.....	4
4.0	Contents of a Practical OCD.....	5
4.1	Overview.....	5
4.2	Content.....	5
5.0	Preparation Guidelines	7
5.1	Goals	7
5.2	Formulation Process.....	7
5.2.1	Introduction.....	7
5.2.2	Participants	7
5.2.3	Generating OCD Content	9
5.2.3.1	Overview.....	9
5.2.3.2	Defining Useful Operational Scenarios.....	9
5.2.3.3	Developing the Scenarios.....	11
5.2.3.4	Determining Logical Functional Flows.....	12
5.2.3.5	Validating the Scenarios.....	12
6.0	Abbreviations and Acronyms.....	12
7.0	References.....	13

CONTENTS

FIGURES

1	System Context.....	2
2	An Effective Operations Concept Document Will "Tell A Story" from the User's Point of View.....	6
3	Outline for Operations Concept Document.....	8
4	Operational Scenario.....	10

APPENDICES

A	Recommended OCD Content.....	15
B	Comparison of Recommended OCD Content to Existing Standard DIDs.....	19
C	Example Scenario Development.....	25

Foreword

This Guide for the Preparation of Operational Concepts Documents (OCD) has been sponsored by the American Institute of Aeronautics and Astronautics (AIAA) as a part of its Standards Program.

While various Government standards require the generation of operations concept information and Data Item Descriptions (DIDs) are available, little information is typically provided which clearly describes the manner in which an OCD should be used in support of a system development. No guidelines regarding which information is most useful, how to develop that information, which developer and customer personnel should participate, or how to document it have been provided. This OCD Preparation Guide provides this information.

The members of the Software Systems Committee on Standards who developed this document have for some time recognized the need for such an OCD preparation guide based upon their own experiences over a broad spectrum of system development activities.

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The AIAA Standards Technical Council (W. W. Vaughan, Chairman) approved this document in November 1992.

1.0 INTRODUCTION

1.1 Purpose

The purpose of this document is to describe a technique called the *Operational Concept* which is to be used to support the definition, development, and maintenance of a system. It is also to provide practical guidelines regarding how to apply this technique and recommends how to package the results of this work into an *Operational Concept Document* (OCD).

1.2 Scope

This guide outlines the operational concept technique and how it may be applied. The main emphasis of this document is to provide practical recommendations on how to perform an operational concept development activity with the focus on the OCD because that is the physical product in which the results of the work are captured. Section 2 of this guide describes the purposes of the operational concept technique, provides an overview of its role in the system development process, and identifies various perspectives from which it may be applied. Section 3 provides a brief discussion of the genesis of the technique and the OCD. Background information on the evolution of the OCD and its current status within the Government sector is also provided. Section 4 describes the kinds of information which an OCD should contain. Section 5 provides guidelines for the preparation of an OCD. Appendix A describes recommended content while Appendix B provides a mapping of the recommended content to existing Data Item Descriptions (DIDs). Appendix C provides an example of the application of this technique and the resultant benefits.

2.0 OPERATIONAL CONCEPT DESCRIPTION

2.1 Purpose of the OCD Technique

The purposes of the OCD are:

- 1) Describe the system characteristics from

an operational perspective.

- 2) Facilitate understanding of the overall system goals with users (including recipients of the products of the system where applicable), buyers, implementors, architects, testers, and managers.
- 3) Form an overall basis for long-range operations planning and provide guidance for development of subsequent system definition documents such as the system specification and the interface specification.
- 4) Describe the user organization and mission from an integrated user / system point of view.

Note that the OCD is an important **complementary** document to the system specification. It should be prepared before the system specification. It should serve as a reference during the system requirements analysis and design phases to provide the necessary framework within which proposed system design and implementation alternatives can be evaluated. The OCD can also be used as an element in evaluating the completeness and consistency of a system design or implementation. The operational concept technique should not be constrained to apply only at the highest system level but can and should be applied at lower levels in a system hierarchy as well.

2.2 Overview of the Role of the OCD

The system and context requirements of an OCD are shown visually in Figure 1.

2.2.1 Definition of System

In the context of this document, a *System* is defined as: a collection of hardware, software, people, facilities, and procedures organized to accomplish some common objectives.¹ It may consist of several levels where each element at each lower level may by this definition itself be considered a

¹ANSI/IEEE Std 729-1983, IEEE Standard Glossary of Software Engineering Terminology