CONTENTS

Section Page

1 INTRODUCTION 1-1

1.1 SCOPE 1-1
1.2 PURPOSE 1-1
1.3 APPLICABILITY 1-1
1.4 RATIONALE 1-2
1.5 MANDATORY SECURITY SECTION 1-3
1.6 DOCUMENT STRUCTURE 1-4
1.7 REFERENCES 1-4

2 OVERVIEW 2-1

2.1 GENERAL 2-1
2.2 VIEWPOINTS AND VIEWPOINT SPECIFICATIONS 2-1
2.3 OVERVIEW OF VIEWPOINTS 2-2
2.4 ENTERPRISE VIEWPOINT 2-3
2.5 FUNCTIONAL VIEWPOINT 2-5
2.6 CONNECTIVITY VIEWPOINT 2-6
2.7 COMMUNICATIONS VIEWPOINT 2-8
2.8 INFORMATION VIEWPOINT 2-11
2.9 CORRESPONDENCES BETWEEN VIEWPOINTS 2-12

3 BASIC CONCEPTS 3-1

3.1 GENERAL 3-1
3.2 DEFINITIONS 3-1
3.3 GRAPHICAL REPRESENTATIONS 3-6
3.4 CHARACTERISTICS OF OBJECTS 3-6

4 ENTERPRISE VIEWPOINT 4-1

4.1 OVERVIEW 4-1
4.2 CONCEPTS 4-1
4.3 ENTERPRISE OBJECTS 4-2
4.4 CHARACTERISTICS OF ENTERPRISE OBJECTS 4-3
4.5 EXAMPLES OF SPACE DATA SYSTEMS DESCRIBED WITH ENTERPRISE VIEWPOINT 4-5
4.6 SECURITY ISSUES IN THE ENTERPRISE VIEWPOINT 4-7

CONTENTS (continued)

Section Page

5 FUNCTIONAL VIEWPOINT 5-1

5.1 OVERVIEW 5-1
5.2 CONCEPTS 5-1
5.3 FUNCTIONAL OBJECTS 5-2
5.4 CHARACTERISTICS OF FUNCTIONAL OBJECTS 5-4
5.5 EXAMPLE OF A SPACE DATA SYSTEM DESCRIBED FROM THE FUNCTIONAL VIEWPOINT 5-6
5.6 EXAMPLE OF SPACE DATA SYSTEM WITH INFORMATION MANAGEMENT INFRASTRUCTURE 5-7
5.7 SECURITY ISSUES IN THE FUNCTIONAL VIEWPOINT 5-8

6 CONNECTIVITY VIEWPOINT 6-1

6.1 OVERVIEW 6-1
6.2 CONCEPTS 6-1
6.3 CHARACTERISTICS OF CONNECTIVITY OBJECTS 6-2
6.4 NODES 6-6
6.5 LINKS 6-7
6.6 EXAMPLES OF SPACE DATA SYSTEMS DESCRIBED WITH CONNECTIVITY VIEWS 6-8
6.7 SECURITY ISSUES IN THE CONNECTIVITY VIEWPOINT 6-13

7 COMMUNICATIONS VIEWPOINT 7-1

7.1 OVERVIEW 7-1
7.2 CONCEPTS 7-1
7.3 CHARACTERISTICS OF COMMUNICATIONS OBJECTS 7-2
7.4 PROTOCOL ENTITIES 7-5
7.5 EXAMPLES OF SPACE DATA SYSTEMS DESCRIBED WITH COMMUNICATIONS VIEWPOINT 7-6
7.6 PROTOCOL REPRESENTATIONS IN THE COMMUNICATIONS VIEWPOINT 7-7
7.7 SECURITY ISSUES IN THE COMMUNICATIONS VIEWPOINT 7-8

8 INFORMATION VIEWPOINT 8-1

8.1 OVERVIEW 8-1
8.2 CONCEPTS 8-1
8.3 CHARACTERISTICS OF INFORMATION OBJECTS 8-2

CONTENTS (continued)

Section Page

8.4 INFORMATION OBJECT VIEWS 8-4
8.5 EXAMPLE OF SPACE DATA SYSTEM FUNCTIONS WITH INFORMATION VIEWPOINT 8-5

9 DERIVING OTHER VIEWS FROM THE BASIC VIEWPOINTS 9-1

9.1 GENERAL 9-1
9.2 CROSS SUPPORT SERVICE VIEWS 9-1
9.3 LAYERED VIEW EXAMPLE 9-3
9.4 EXAMPLE MAPPING FUNCTIONAL TO CONNECTIVITY VIEW 9-5

ANNEX A NOTES ON USE OF RASDS A-1
ANNEX B FORMAL METHODS AND TOOLS B-1
ANNEX C RASDS AND DODAF COMPARISON C-1
ANNEX D GLOSSARY AND ACRONYMS D-1

Figure

2-1 Simple Example of Enterprise View 2-5
2-2 Simple Example of a Functional View 2-6
2-3 Simple Connectivity View Example 2-7
2-4 Example Connectivity View Showing Implemented Functions 2-8
2-5 Simple Example of Communications View 2-10
2-6 Communications View with Protocol Entities and Engineering Objects 2-11
2-7 Example of Information View Showing Basic Object Model 2-12
2-8 RASDS Top Level Object Relationships 2-13
3-1 Icons Used in This Document 3-6
3-2 Representation of Objects 3-7
4-1 Attributes of Enterprise Objects 4-4
4-2 Example of an Enterprise View (Mission A) 4-6
4-3 Example of Multi-Agency Enterprise View (Mission Q) 4-7
5-1 Functional Object Interfaces 5-4
5-2 Example of Functional View (Functional Objects and Interactions) 5-6
5-3 Example of Information Flows between Objects 5-7
5-4 Representative Functional Objects and Information Management Infrastructure Elements 5-8
6-1 Attributes of Nodes 6-2
6-2 Example of Connectivity View (Nodes for Mission A) 6-8
6-3 Example of Connectivity View (Nodes for Mission Q) 6-9
6-4 Example of Connectivity View (Node Decomposition) 6-10

CONTENTS (continued)

Figure Page

6-5 Example of Connectivity View with Allocated Engineering Objects 6-11
6-6(a) Functional View of Image Compression 6-12
6-6(b) Connectivity View of Software Compression Approach..... 6-12
6-6(c) Connectivity View of Hardware-Only Compression Approach..... 6-12
7-1 Attributes of Protocol Entities 7-2
7-2 Example of Communications View Showing Protocol Stack and Nodes 7-6
7-3 PDU Example, Space Packet Protocol 7-7
7-4 Example State Machine Diagram—SLE RCF..... 7-8
8-1 Attributes of Information Objects..... 8-2
8-2 Information Object Representations..... 8-4
8-3 Example of Functional View with Representation of Information Objects 8-6
9-1(a) Enterprise View of a Cross Support Service 9-1
9-1(b) Connectivity View of a Cross Support Service 9-2
9-1(c) Communications View of a Cross Support Service..... 9-3
9-2 Simple Example of Layered View..... 9-4
9-3 Example of Functional View of Framing and Coding..... 9-5
9-4 Example of Trade Study Mapping Functional to Connectivity View 9-6
B-1 SysML Diagram Types (SysML Partners) B-3
C-1 DoDAF Elements and Relationships (Partial).....C-6
C-2 DoDAF and RASDS.....C-8

Table

4-1 Example Enterprise Objects 4-3
5-1 Example Functional Objects..... 5-3
5-2 Typical Infrastructure Objects 5-4
6-1 Typical Nodes..... 6-6
6-2 Typical Links..... 6-8
7-1 Typical Protocol Entities 7-5
C-1 DoDAF Views and Products and RASDS Viewpoints C-3