

625-EMD-002

EOSDIS Maintenance and Development Project

Training Material for the EMD Project Volume 2: Introduction and Detailed System Overview: Science Data Processing Internal Training

July 2004

Raytheon Company
Upper Marlboro, Maryland

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July 2004

Prepared Under Contract NAS5-03098
CDRL Item 23

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Preface

This document is a formal contract deliverable. It requires Government review and approval within 45 business days. Changes to this document will be made by document change notice (DCN) or by complete revision.

Any questions should be addressed to:

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Revision History

Document Number	Status/Issue	Publication Date	CCR Number
625-EMD-002	Original	July 2004	N/A

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Abstract

This is Volume 2 of a series of lessons containing the training material for the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Project. This lesson provides an introduction and detailed system overview of EOSDIS Core System (ECS) design and internal interfaces.

Keywords: training, instructional design, course objective, Earth Science Enterprise, Science Data Processing, Internal Training.

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Abstract

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Introduction

Identification

Training Material Volume 2 is part of Contract Data Requirements List (CDRL) Item 23, which is a required deliverable under the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Contract (NAS5-03098).

Scope

Training Material Volume 2 provides an introduction and detailed system overview of ECS design and internal interfaces. The instruction briefly addresses the program context of ECS within NASA's Earth Science Enterprise, introduces the systems that make up ECS, describes each subsystem and its Computer Software Configuration Items (CSCIs), and then describes system functioning in the context of operational scenarios. This lesson is designed to provide the operations staff with sufficient knowledge and information to satisfy all lesson objectives.

Purpose

The purpose of this Student Guide is to provide a summary and copy of the visuals for a detailed course of instruction that forms the basis for understanding ECS overall structure and function. Lesson objectives are developed and will be used to guide the flow of instruction for this lesson. The lesson objectives will serve as the basis for verifying that all lesson topics are contained within this Student Guide and slide presentation material.

Status and Schedule

This lesson module provides detailed information about training for the current baseline of the system. Revisions are submitted as needed.

Organization

This document is organized as follows:

- | | |
|------------------------|--|
| Introduction: | The Introduction presents the document identification, scope, purpose, and organization. |
| Related Documentation: | Related Documentation identifies parent, applicable and information documents associated with this document. |
| Student Guide: | The Student Guide summarizes the core elements of this lesson. All Lesson Objectives and associated topics are included. |
| Slide Presentation: | Slide Presentation is reserved for all slides used by the instructor during the presentation of this lesson. |

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Related Documentation

Parent Documents

The parent documents are the documents from which the EMD Training Material's scope and content are derived.

423-41-01	Goddard Space Flight Center, EOSDIS Core System (ECS) Statement of Work
423-46-03	EMD Task 101 Statement of Work For ECS SDPS Maintenance
423-46-02	Contract Data Requirements Document for EMD Task 101 ECS SDPS Maintenance

Applicable Documents

The following documents are referenced within this EMD Training Material, or are directly applicable, or contain policies or other directive matters that are binding upon the content of this document:

420-05-03	Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)
423-41-02	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) (ECS F&PRS)
423-46-01	Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) Science Data Processing System (EMD F&PRS)

Information Documents

Information Documents Referenced

The following documents are referenced herein and amplify or clarify the information presented in this document. These documents are not binding on the content of the EMD Training Material.

305-EMD-001	Release 7 Segment/Design Specification for the EMD Project
313-EMD-001	Release 7 ECS Internal Interface Control Document for the EMD Project

Information Documents Not Referenced

The following documents, although not referenced herein and/or not directly applicable, do amplify or clarify the information presented in this document. These documents are not binding on the content of the EMD Training Material.

311-EMD-001	Release 7 Data Management Subsystem (DMS) Database Design and Database Schema Specifications for the EMD Project
311-EMD-002	Release 7 INGEST (INS) Database Design and Schema Specifications for the EMD Project
311-EMD-003	Release 7 Planning and Data Processing Subsystem Database Design and Schema Specifications for the EMD Project
311-EMD-004	Release 7 Science Data Server Database Design and Schema Specifications for the EMD Project
311-EMD-005	Release 7 Storage Management and Data Distribution Subsystems Database Design and Database Schema Specifications for the EMD Project
311-EMD-006	Release 7 Subscription Server Database Design and Schema Specifications for the EMD Project
311-EMD-007	Release 7 Systems Management Subsystem Database Design and Schema Specifications for the EMD Project
311-EMD-008	Release 7 Registry Database Design and Schema Specifications for the EMD Project
311-EMD-009	Release 7 Product Distribution Subsystem (PDS) Database Design and Database Schema Specifications for the EMD Project
311-EMD-010	Release 7 NameServer Database Design and Schema Specifications for the EMD Project
311-EMD-011	Release 7 Order Manager Server Database Design and Schema Specifications for the EMD Project
311-EMD-012	Release 7 Spatial Subscription Server Database Design and Schema Specifications for the EMD Project
311-EMD-013	Release 7 Data Pool Database Design and Schema Specifications for the EMD Project
609-EMD-001	Release 7 Operations Tools Manual for the EMD Project
611-EMD-001	Mission Operation Procedures for the EMD Project
910-TDA-022	Custom Code Configuration Parameters for ECS
152-TP-001	ACRONYMS for the EOSDIS Core System (ECS) Project
152-TP-003	Glossary of Terms for the EOSDIS Core System (ECS) Project

Introduction and Detailed System Overview: Science Data Processing Internal Training

Lesson Overview

This lesson provides a brief illustration of the place of the Earth Observing System Data and Information System (EOSDIS) Core System (ECS) within NASA's Earth Science Enterprise, introduces the subsystems that make up ECS at a site, examines each subsystem and its computer software configuration items, including system elements and interfaces, and describes system function in the context of operational scenarios.

Lesson Objectives

Overall Objective - The overall objective of this lesson is to become able to describe ECS structure and functions for Science Data Processing (SDP). The lesson is a dynamic, animated visual presentation illustrating subsystems, their components and interfaces, and their functions and interrelationships in the context of operations. It is not a complete description of all ECS structure and functioning, and it does not include full descriptions of specific entities in the ECS overall program (e.g., System Monitoring and Coordination Center). It is not a software development lesson and does not include an exhaustive description of ECS interfaces and event sequences. It includes no hands-on exercises, and is not intended as training on how to perform ECS operations.

Condition - The student will be given oral or written information and requirements for describing ECS structure and functions for Science Data Processing (SDP), a copy of 305-EMD-001, *Release 7 Segment/Design Specification for the EMD Project*, and a copy of 313-EMD-001, *Release 7 ECS Internal Interface Control Document for the EMD Project*.

Standard - The student will describe ECS structure and functions for Science Data Processing (SDP) without error.

Specific Objective 1 - The student will identify ECS subsystems and their computer software configuration items (CSCIs).

Condition - The student will be given a copy of 305-EMD-001, *Release 7 Segment/Design Specification for the EMD Project*.

Standard - The student will list 13 subsystems and specify the CSCIs that make up 12 of the 13 subsystems.

Specific Objective 2 - The student will specify for each CSCI the major components and the major functions or processes for which each component is responsible.

Condition - The student will be given a copy of 305-EMD-001, *Release 7 Segment/Design Specification for the EMD Project*.

Standard - The student will correctly identify the major components and their functions for the CSCIs, as listed in 305-EMD-001, *Release 7 Segment/Design Specification for the EMD Project*.

Specific Objective 3 - The student will describe the role of ECS CSCIs and their functions or processes in the context of ECS operational scenarios.

Condition - The student will be given a copy of 313-EMD-001, *Release 7 ECS Internal Interface Control Document for the EMD Project*.

Standard - The student will summarize the role of the relevant ECS CSCIs and their components in selected ECS operations, including ASTER Data Acquisition Requests and expedited data support, production and distribution of data products, update of quality assurance metadata, on-demand processing, and user registration.

Importance

Knowledge of overall ECS structure and function, and ability to locate and use relevant information in documents 305-EMD-001 and 313-EMD-001, can provide helpful context for conducting ECS operations and maintenance. This lesson provides the necessary overview, and an efficient summary and guide for reviewing and using the information in the documents.

Summary of the Lesson Presentation

This lesson is composed of a dynamic, animated visual presentation. It is divided into several segments.

Program Overview

The main content of the lesson begins with an overview of the place of ECS in NASA's Earth Science Enterprise, part of the U.S. Global Change Research Program. Slides 4 - 7 address this overview.

Subsystems and Functions

The lesson provides a context diagram illustrating interrelationships among ECS subsystems, and then introduces and examines each subsystem (Slides 8 - 12). For each subsystem, the lesson presents major functions, CSCIs and components, and major interfaces among components, CSCIs, and other subsystems. Subsystems addressed include:

- Data Server (DSS): Slides 13 - 21.
- Product Distribution System (PDS): Slides 22 - 34.
- Ingest (INS): Slides 35 - 40.
- Spatial Subscription Server (SSS): Slides 41 – 44.
- Data Pool (DPL): Slides 45 – 50.
- Client (CLS): Slides 51 - 58.
- Data Management (DMS): Slides 59 - 65.
- Order Manager (OMS): Slides 66 – 71.
- Planning (PLS): Slides 72 - 76.
- Data Processing (DPS): Slides 77 - 88.
- System Management Support (MSS): Slides 89 - 100.
- Communications (CSS): Slides 101 - 106.
- Internetworking (ISS): Not addressed in detail in this lesson.

ECS Operational Functioning

ECS operational functioning, introduced in Slides 107 and 108, is addressed using selected scenarios. The source material in *Release 7 ECS Internal Interface Control Document for the EMD Project*, document 313-EMD-001, contains additional scenarios, but the ones selected for this lesson illustrate system functioning and the major roles of the subsystems, CSCIs, and components. The animated presentation for this part of the lesson consists of several series of clusters of three visual displays. In each cluster, the first display introduces a step or function at a conceptual level. The second display shows interactions at the subsystem level. The third display shows interactions at the CSCI and component level.

ASTER Data Acquisition Request (DAR) Support

The ASTER DAR support scenario, introduced in Slide 109, illustrates ECS functioning for DAR submission, Data Subscription, and attached On-Demand Processing Request. Slides 110 - 122 present this scenario.

ASTER Chaining and On-Demand Production

The chaining and on-demand production scenario illustrates Data Insertion, Data Notification, On-demand Production, Standing Order Delivery, and Quality Assurance Update. Slides 123 - 175 present this scenario.

ASTER Expedited Data

The ASTER expedited data scenario illustrates Data Subscription, Data Insertion, and Data Notification. Slides 176 - 188 present this scenario.

User Registration

The user registration scenario is presented in Slides 189 - 197.

MODIS Data Access

The MODIS data access scenario illustrates search and order of MODIS data. It also illustrates data distribution by ftp push. Slides 198 - 211 present this scenario.

Summary and References

The lesson concludes with a brief summary (Slide 212) and identification of references (Slide 213). As noted previously, the references are documents 305-EMD-001 and 313-EMD-001.

Slide Presentation

Slide Presentation Description

The following slide presentation represents the slides used by the instructor during the conduct of this lesson.

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