

625-EMD-221

## **EOSDIS Maintenance and Development Project**

# **Training Material for the EMD Project Volume 1: Course Outline**

Revision --

March 2009

Raytheon Information Solutions  
Riverdale, Maryland

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# Training Material for the EMD Project Volume 1: Course Outline

Revision --

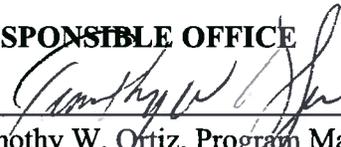
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## RESPONSIBLE ENGINEER

  
\_\_\_\_\_  
Lay'wan Gamble Date  
EOSDIS Maintenance and Development Project

## RESPONSIBLE OFFICE

  
\_\_\_\_\_  
Timothy W. Ortiz, Program Manager Date  
EOSDIS Maintenance and Development Project

Raytheon Information Solutions  
Riverdale, Maryland

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# Preface

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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:

Data Management Office  
The EMD Project Office  
Raytheon Information Solutions  
5700 Rivertech Court  
Riverdale, Maryland 20737

## Revision History

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# Abstract

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Volume 1 of the training material for the Earth Observing System Data and Information System (EOSDIS) Maintenance and Development (EMD) Project is the Training Course Outline. The course outline lists a series of sub-tasks that will be used to define a comprehensive course of instruction for the EMD Project. The training addressed in this outline is related to the specific system design, components and operation of the current baseline of the system and does not include training on management or personal development.

**Keywords:** training, instructional design, course objective.

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# Contents

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## Preface

## Abstract

## Introduction

Identification.....	1
Scope.....	1
Purpose.....	1
Status and Schedule .....	1
Organization.....	1

## Related Documentation

Parent Documents .....	3
Applicable Documents.....	3
Information Documents .....	3
Information Documents Referenced .....	3
Information Documents Not Referenced.....	4

## Course Outline

Volume 2: Problem Management .....	5
Volume 3: Ingest.....	6
Volume 4: Data Distribution.....	7
Volume 5: Archive.....	9

## **Training Schedule**

Course Duration .....	13
-----------------------	----

## **List of Tables**

1 Course Duration Summary .....	13
---------------------------------	----

## **Abbreviations and Acronyms**

# Introduction

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## Identification

Training Material Volume 1 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 1 (Course Outline) provides an overview of available courses developed to support operator training for the EOSDIS Core System (ECS). Each lesson contains a list of tasks (grouped together by subject) required to operate the system. The tasks serve as the foundation of the operator training course and define expectations for each lesson.

## Purpose

The course outline highlights the learning path for curriculum development as well as course conduct. Lesson objectives are formed using the tasks listed in the course outline. The objectives serve as the basis for Student Guide and slide presentation material development and course conduct.

## Status and Schedule

This document provides an outline of 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. |
| Course Outline:        | The Course Outline section identifies and defines the lesson topics, duration, and scope of the course.      |

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# Related Documentation

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## 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.

609-EMD-220	Release 7.22 Operations Tools Manual for the EMD Project.
611-EMD-220	Release 7.22 Mission Operation Procedures 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.

305-EMD-220	Release 7.22 Segment/Design Specification for the EMD Project.
311-EMD-220	Release 7.22 INGEST (INS) Database Design and Schema Specifications for the EMD Project.
311-EMD-224	Release 7.22 Order Manager Database Design and Database Schema Specifications for the EMD Project.
311-EMD-225	Release 7.22 Spatial Subscription Server (SSS) Database Design and Schema Specifications for the EMD Project.
311-EMD-226	Release 7.22 Data Pool Database Design and Schema Specifications for the EMD Project.
311-EMD-227	Release 7.22 Archive Inventory Management (AIM) Database Design and Schema Specifications for the EMD Project.

# Course Outline

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The Operator Training Course is grouped into modular lessons based on common task groupings and operational requirements. Each lesson outline will contain a lesson description, a list of recommended class attendees (by position), Commercial Off-the-Shelf (COTS) hardware (HW) and software (SW) requirements, duration (lab and lecture) and a list of sub-tasks required to satisfy the overall lesson objective using tools described in Document 609-EMD-220 (*Release 7.22 Operations Tools Manual for the EMD Project*) and procedures described in Document 611-EMD-220 (*Release 7.22 Mission Operation Procedures for the EMD Project*). The course consists of the lessons that follow:

## Volume 2: Problem Management

Volume 2 provides a detailed description of the different tasks that are required in order to report a problem. The lesson includes a detailed review of the trouble ticket process.

Attendees: All DAAC Operator and Support personnel, all SMC Operator and Support personnel, all Sustaining Engineering personnel, all ILS personnel, all Investigator support personnel and all IV & V contractor personnel.

Prerequisites: None.

Duration: 2 Hours (1 Lecture, 1 Lab)

Sub-tasks:

1. Writing a trouble ticket.
  - a. Writing/submitting trouble tickets.
2. Documenting changes.
  - a. Reviewing and modifying trouble tickets.
3. Problem management.
  - a. Control board reviews.
  - b. Assessing/categorizing problem severity.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will write a trouble ticket.
2. Students will document trouble ticket changes.
3. Students will evaluate trouble tickets and critique the description and assignment of severity.

## Volume 3: Ingest

Volume 3 provides a detailed description of the process for receiving ingesting data from external data providers. It includes methods for monitoring the performance of ingest requests, and modifying ingest parameters.

Attendees: DAAC Archive Manager, DAAC Ingest Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: None.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Ingest concepts.
2. Logging in to system hosts.
3. Launching the ECS Data Pool Ingest GUI and Data Pool Maintenance GUI.
4. Monitor and control SIPS ingest requests.
5. View history of Ingest Requests.
6. Monitor and control Provider Status.
7. Monitor and control File System Status.
8. Monitor and control Transfer Host Status.
9. Monitor and control ECS Service Status.
10. Review Ingest Requests with Open Interventions.
11. Review System Alerts.
12. Configure a Data Provider.
13. Configure a Data Type.
14. Configure a Transfer Host.
15. Configure a File System.
16. Configure an ECS Service.
17. Perform Global Tuning.
18. Configure a Volume Group.
19. Generate Ingest Report.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Logging in to system hosts.
2. Launching the ECS Data Pool Ingest GUI and Data Pool Maintenance GUI.
3. Monitor and control Ingest Requests.
4. View history of Ingest Requests.

5. Monitor and control Provider Status.
6. Monitor and control File System Status.
7. Monitor and control Transfer Host Status.
8. Monitor and control ECS Service Status.
9. Review Ingest Requests with Open Interventions.
10. Review System Alerts.
11. Configure a Data Provider.
12. Configure a Data Type.
13. Configure a Transfer Host.
14. Configure a File System.
15. Configure an ECS Service.
16. Perform Global Tuning.
17. Configure a Volume Group.
18. Generate Ingest Reports.

## **Volume 4: Data Distribution**

Volume 4 provides information to support the operators in distributing science data using various media. This lesson provides a complete process by which the Distributed Active Archive Center (DAAC) personnel perform data distribution, including order management using the Order Manager (OM) graphical user interface (GUI). The processes described in the lesson apply to Distribution Technicians and includes such tasks as monitoring data distribution requests; changing the priority of a distribution request; canceling, suspending and/or resuming a distribution request; unloading/loading tape stackers. The procedures involved in OM GUI operation include such tasks as launching the OM GUI, responding to an open intervention, viewing distribution request information, viewing a completed intervention, and checking OM queue status.

Attendees: DAAC Archive Manager, DAAC Distribution Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: None.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Distribution concepts.
2. Logging in to system hosts.
3. Monitoring/controlling distribution requests.
4. Launching the Order Manager GUI.

5. View open intervention information on the OM GUI
6. Respond to distribution open interventions
7. Monitoring/controlling Order Manager operations (including physical media distribution).
8. Change priority of a distribution request.
9. Suspend, Resume, Cancel, Resubmit, Stop a distribution request.
10. View HEG interventions.
11. Respond to HEG distribution open interventions.
12. View pending HEG granules.
13. View Operator Alerts.
14. View completed operator action or intervention.
15. View and respond to suspended ftp push distribution destinations.
16. Check and modify OM queue status.
17. Check and modify HEG Order status.
18. Check Staging status.
19. Check and modify OM configuration parameters.
20. Add a destination to frequently used destination list.
21. View the OM GUI Log.
22. View PMD open intervention information.
23. Respond to a PMD open intervention.
24. Check and modify PMD device configuration
25. Monitor and control PMD media creation.
26. Prepare an input file for use with the OMS Configuration CI.

Practical Exercises: The student will perform the following hands-on training exercises:

1. Students will log in to system hosts.
2. Students will launch the Order Manager GUI.
3. Students will monitor/control data distribution requests.
4. Students will view open intervention information on the OM GUI.
5. Students will respond to an open interventions.

6. Students will monitor/control Order Manager operations (including physical media distribution).
7. Students will change the priority of a distribution request using the OM GUI.
8. Students will suspend, resume, cancel, or resubmit a distribution request using the OM GUI.
9. Students will view open HDF-EOS to GeoTIFF Conversion Tool (HEG) request intervention information on the OM GUI.
10. Students will respond to an open HEG intervention.
11. Students will view pending HEG granules on the OM GUI.
12. Students will view operator alerts on the OM GUI.
13. Students will view a completed operator action or intervention.
14. Students will view and respond to suspended ftp push distribution destinations.
15. Students will check/modify OM queue status.
16. Students will check/modify HEG order status.
17. Students will check staging status.
18. Students will check/modify OM configuration parameters.
19. Students will add a destination to the frequently used destinations list.
20. Students will view the OM GUI log.
21. Students will view physical media distribution (PMD) open intervention information on the OM GUI.
22. Students will respond to a PMD open intervention.
23. Students will check and modify PMD device configuration.
24. Students will monitor/control PMD media creation on the OM GUI.
25. Students will prepare an input file for use with the OMS Configuration CI.

## **Volume 5: Archive**

Volume 5 reviews the process for archiving data. This lesson includes a description of processing for monitoring the ingest/archival/distribution performance, maintaining configuration of peripherals and data servers, documenting archive errors, maintaining archive processing queue (both storing and retrieval), managing archive content and capacity, submitting new data archive requests to the Science Coordinator and providing archive status.

Attendees: DAAC Archive Manager, DAAC Ingest Technician, DAAC System Engineer, DAAC System Test Engineer, DAAC SW Maintenance Engineer, DAAC User Services Representative and Sustaining Engineering personnel.

Prerequisites: Introduction and Detailed System Overview; Science Data Processing Internal Training and Problem Management lessons.

Duration: 8 Hours (4 Lecture, 4 Lab)

Sub-tasks:

1. Overview of archive processing.
  - a. Archive Manager.
  - b. Hardware.
  - c. Major parts of Operator's panel.
  - d. Describe the StorNext Storage Manager (SNSM) software.
2. Starting and shutting down STORNEXT.
  - a. Starting the STORNEXT tape archive system.
  - b. Shutting down STORNEXT tape archive system.
  - c. Rebooting STORNEXT.
  - d. Entering the archive after STORNEXT is started.
3. Archive storage structures.
  - a. Storage element relationships.
4. Insert data into the archive.
  - a. Archive insert scenario.
5. Deleting Granules.
  - a. Deletion capability and features.
  - b. Deletion sequence.
  - c. Undelete capability.
6. Loading archive media.
  - a. Automatically loading archive media.
  - b. Manually loading archive media.
  - c. Formatting a volume.
  - d. Remove media.
7. Backup archived data.
  - a. Creating offsite backups.
  - b. Creating a backup for STORNEXT.

- c. Replacing the STORNEXT database backup volume (Volume 1).
  - d. Create replacement backups manually from existing archives.
8. Restore archive data.
  - a. Use of backup data for recovery.
9. STORNEXT queue.
  - a. Display what is in the STORNEXT Queue.
10. System Log file.
  - a. Display STORNEXT messages from the system log file.
11. STORNEXT Graphical User Interface.
  - a. Using the STORNEXT GUI.
  - b. Modify a volume group.
  - c. Modify a volume.
12. Data Pool Management.
  - a. Features of the Data Pool Maintenance GUI.
  - b. Using the Data Pool Maintenance GUI.
  - c. Working with Data Pool scripts.
  - d. Tuning Data Pool and Order Manager Subsystem configuration parameters.
  - f. Troubleshooting Data Pool problems.
13. Using the Spatial Subscription Server (NBSRV) GUI.
  - a. Features of the Spatial Subscription Server (NBSRV) GUI.
  - b. Using the Spatial Subscription Server (NBSRV) GUI.

Practical Exercises: The student perform the following hands-on training exercises:

1. Students will start and shut down STORNEXT.
2. Students will use the Data Distribution GUI to examine the list of distribution requests.
3. Students will monitor an archive request.
4. Students will monitor retrieval of data from the archive.
5. Students will use the Granule Delete capability to delete granules from the archive and inventory.
6. Students will load archive media.

7. Students will use STORNEXT commands and utilities to monitor archive and STORNEXT activities and status.
8. Students will run the STORNEXT\_log script to display STORNEXT messages.
9. Students will use the Data Pool Maintenance GUI to monitor and control Data Pool insert actions.
10. Students will use the NBSRV GUI to display subscriptions in the NBSRV database, view acquire and notification actions in the Action Queue, manage bundling orders, and display statistics on NBSRV processing of events and actions.
11. Students will run the Update Granule Utility to extend the period of retention for a single granule in the Data Pool.
12. Students will invoke the Data Pool Cleanup Utilities EcDICleanupGranules and EcDICleanupFilesOnDisk from the command line.
13. Students will invoke the Data Pool Softlink Check Utility from the command line.
14. Students will invoke the Data Pool Inventory Validation Utility from the command line.
15. Students will invoke the Data Pool Checksum Verification Utility (DPCV) from the command line.
16. Students will execute the Data Pool Access Statistics Utility from the command line.
17. Students will use the Data Pool Archive Access Statistics Data Utility to archive statistics on Data Pool access.
18. Students will use the Batch Insert Utility to insert granules from the archive into the Data Pool.
19. Students will invoke the Archive Checksum Verification Utility (ACVU) from the command line.
20. Students will invoke the XML Check Utility (XCU) from the command line.

# Training Schedule

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## Course Duration

Table 1 provides a summary of the course duration. This summary is tied to the duration of each lesson and reflects the lecture-to-lab ratio for each lesson.

**Table 1. Course Duration Summary**

<b>LESSON</b>	<b>DURATION (Hrs)</b>	<b>LECTURE/LAB (Hrs)</b>
Problem Management	2	1/1
Ingest	8	4/4
Data Distribution	8	4/4
Archive	8	4/4
<b>TOTAL</b>	<b>26</b>	<b>13/13</b>

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# Abbreviations and Acronyms

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Additional abbreviations and acronyms are listed in document 508-EMD-001, ACRONYMS for the EOSDIS Maintenance and Development (EMD) Project.

ACVU	Archive Checksum Verification Utility
API	Applications Program Interface
CBT	Computer Based Training
CDR	Critical Design Review
CDRL	Contract Data Requirements List
CM	Configuration Management
COTS	Commercial Off-the-Shelf
CR	Classroom presentation equipment
CSCI	Computer Software Configuration Item
DAAC	Distributed Active Archive Center
DBA	Database Administration
DCN	Document Change Notice
DID	Data Item Description
DPCV	Data Pool Checksum Verification Utility
DPL	Data Pool
DPM	Data Pool Maintenance
DPREP	Data Preprocessing
DPS	Data Processing Subsystem
DSS	Data Server Subsystem
DUE	DAAC Unique Extension
ECS	EOSDIS Core System
EMD	EOSDIS Maintenance and Development [Project]
EMSn	EOS Mission Support Network
EOC	EOS Operations Center

EOSDIS	Earth Observing System Data Information System
ESDT	Earth Science Data Type
GeoTIFF	Georeferenced Tagged Image File Format
GUI	Graphical User Interface
HDF	Hierarchical Data Format
HEG	HDF-EOS to GeoTIFF Conversion Tool
HW	Hardware
I&T	Integration and Test
ILM	Inventory/Logistical Management
ILS	Integrated Logistics Support
IV&V	Independent Verification and Validation
LSM	Local System Management
MSS	System Management Subsystem
NASA	National Aeronautics and Space Administration
NBSRV	Spatial Subscription Server
OGC	Open Geospatial Consortium
OWS	Open Geospatial Consortium (OGC) Web Services
PAN	Product Acceptance Notification
PDR	Product Deliver Records
PDRD	Product Delivery Discrepancy Report
PDS	Product Distribution System
PMD	Physical Media Distribution
QA	Quality Assurance
S/C	Spacecraft
SCF	Science Computing Facility
SCP	Secure Copy
SDP	Science Data Processing
SE	Sustaining Engineering
SIPS	Science Investigator-Led Processing Systems

SME Subject-Matter Expert

SW Software

T<sup>3</sup> Train-the-Trainer

XCU XML Check Utility

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