**EOSDIS Maintenance and Development Project**

# Training Material for the EMD Project Volume 3:  Problem Management

Revision 02

July 2006

Raytheon Company
Upper Marlboro, Maryland
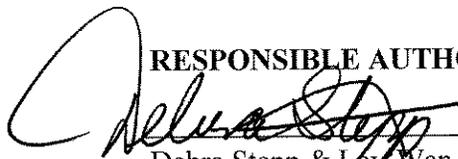
# Training Material for the EMD Project
# Volume 3:  Problem Management

**Revision 02**
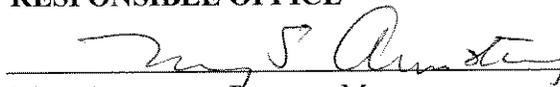
**July 2006**

Prepared Under Contract NAS5-03098
CDRL Item 23

**RESPONSIBLE AUTHOR**

_____     July 27, 2006
Debra Stepp & Lay Wan Gamble                  Date
EOSDIS Maintenance and Development Project

**RESPONSIBLE OFFICE**

_____   7/27/2006
Mary Armstrong, Program Manager              Date
EOSDIS Maintenance and Development Project

**Raytheon Company**
Upper Marlboro, Maryland

625-EMD-003, Rev. 02

This page intentionally left blank.

# 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:

Data Management Office
The EMD Project Office
Raytheon Company
1616 McCormick Drive
Upper Marlboro, Maryland 20774-5301

## Revision History

| Document Number | Status/Issue | Publication Date | CCR Number |
|---|---|---|---|
| 625-EMD-003 | Original | July 2004 | 04-0384 |
| 625-EMD-003 | Revision 01 | July 2005 | 05-0320 |
| 625-EMD-003 | Revision 01 | July 2006 | 06-0377 |

This page intentionally left blank.

# Abstract

This is Volume 3 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 a detailed description of the process required for submitting and updating trouble tickets as well as investigating problems and identifying and implementing solutions.

*Keywords:* training, instructional design, course objective, problem management, trouble ticket, Help Desk, Problem Review Board, Non-conformance Report, NCR, Remedy.

This page intentionally left blank.

# Contents

**Preface**

**Abstract**

**Contents**

**Introduction**

**Related Documentation**

**Problem Management Overview**

# Writing a Trouble Ticket (TT)

# Documenting Changes

# Problem Management

# Practical Exercise

# Slide Presentation

# Introduction

## Identification

Training Material Volume 3 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 3 describes the process and procedures by which trouble tickets are submitted and updated. In addition, the lesson describes in general terms the processes by which problems submitted on trouble tickets are investigated and solutions are identified and implemented. 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 detailed course of instruction that forms the basis for understanding problem management. 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 identifies 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. |

This page intentionally left blank.

# 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.

| | |
|---|---|
| 110-EMD-001 | Configuration Management Plan for the EMD Project |
| 609-EMD-001 | Release 7.11 Operations Tools Manual for the EMD Project |
| 611-EMD-001 | Release 7.11 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-001           Release 7.11 Segment/Design Specification for the EMD Project

313-EMD-001           Internal Interface Control Document for the EMD Project

508-EMD-001           ACRONYMS for the EOSDIS Maintenance and Development (EMD) Project

152-TP-003            Glossary of Terms for the EOSDIS Core System (ECS) Project

# Problem Management Overview

## Lesson Overview

This lesson will provide you with the complete process by which trouble tickets are submitted and updated.  In addition, the lesson describes in general terms the processes by which problems submitted on trouble tickets are assigned priorities, investigated, and resolved.

## Lesson Objectives

**Overall Objective -** The overall objective of the Problem Management lesson is for maintenance and operations personnel to develop proficiency in the procedures that apply to the trouble ticketing/problem resolution process for the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS).

**Condition -** The student will be given a written description of an operational problem (affecting system hardware, software, documentation, or procedures), access to the trouble ticket system, a copy of 609-EMD-001, *Release 7.11 Operations Tools Manual for the EMD Project,* and a copy of 611-EMD-001, *Release 7.11Mission Operation Procedures for the EMD Project*.

**Standard -** The student will use the trouble ticket system without error in accordance with the prescribed process and procedures to submit, update and complete the specified parts of a trouble ticket.

**Specific Objective 1 -** The student will perform the steps involved in submitting a trouble ticket.

**Condition -** The student will be given a description of an operational problem to be reported through the trouble ticket system, access to the trouble ticket system (through a workstation or terminal), a copy of 609-EMD-001, *7.11 Operations Tools Manual for the EMD Project,* and a copy of 611-EMD-001, *7.11 Mission Operation Procedures for the EMD Project*.

**Standard -** The student will perform without error the steps involved in submitting a trouble ticket in accordance with the applicable procedure, including entry of information sufficiently accurate and complete to permit correct assignment of severity.

**Specific Objective 2 -** The student will perform the steps involved in making a change to an existing trouble ticket.

**Condition -** The student will be given a description of a change to be made to an existing trouble ticket, access to the trouble ticket system (through a workstation or terminal), a copy of 609-EMD-001, *7.11 Operations Tools Manual for the EMD Project,* and a copy of 611-EMD-001, *7.11 Mission Operation Procedures for the EMD Project*.

**Standard -** The student will perform without error the steps involved in making a change to an existing trouble ticket in accordance with the applicable procedure.

**Specific Objective 3 -** The student will describe the general steps in the routine trouble ticket problem resolution process, including the differences that result from assignment of the various priority levels.

**Condition -** The student will be given a description of a routine operational problem to be resolved through the problem resolution process, a copy of 609-EMD-001, *7.11 Operations Tools Manual for the EMD Project,* and a copy of 611-EMD-001, *7.11 Mission Operation Procedures for the EMD Project*.

**Standard -** The student will state without error the general steps involved in the routine trouble ticket problem resolution process in accordance with the applicable procedure.

## Importance

This lesson applies to students who are internal users or operators of the system (including support staff). The lesson will provide them with the knowledge and skills needed for submitting trouble tickets and making additional entries on trouble tickets in the course of investigating system problems reported on trouble tickets. They need the knowledge and skills on the job when they encounter system hardware, software, documentation or procedural problems that they cannot readily fix, that affect other users/operators, or that are system-wide problems. The lesson describes why and how trouble tickets are submitted and updated. In addition, it describes in general terms the processes by which problems submitted on trouble tickets are assigned priorities, investigated and resolved. Consequently, the students will become aware of what happens to the trouble tickets they submit and how clear and complete inputs to the DAAC Support Help Desk ensure the greatest effectiveness of support in problem resolution.

# Writing a Trouble Ticket (TT)

## Purpose and Functions of Trouble Tickets

A trouble ticket (TT) is an electronic document that serves the following purposes:

- Reporting/recording problems.
- Recording an idea for a system enhancement.

The problems reported most frequently affect the following system components:

- Hardware.
- Software.
- Technical documents.
- Procedures.

Trouble tickets are submitted by Operations or Sustaining Engineering personnel at the Distributed Active Archive Centers (DAACs).

Trouble tickets have several possible states:

- New.
- Assigned.
- Solution Proposed.
- Implement Solution.
- Solution Implemented.
- Closed.
- Forwarded.
- Work Around.
- Not Repeatable.

A local trouble ticket is "open" (in process) until the problem has been resolved and the problem resolution has been officially approved. Then the trouble ticket is "closed." A local trouble ticket may be closed by referring the problem to EMD Operations (OPS) Deployment.

Problems which require changes that could have significant effects on the system configuration (e.g., change of a baselined Configuration Parameter) must be referred to the configuration management process. If the TT investigation indicates that a configuration change is required to solve a problem or to develop an enhancement, the subject of the TT becomes a configuration management issue and a Configuration Change Request (CCR) is prepared.

- A CCR provides documentation of the configuration management process by which changes to system configuration items (CIs) or configuration controlled items are approved and implemented.

- A trouble ticket leads to a CCR only when a configuration change is proposed.

The trouble ticket system provides a consistent means of…

- Reporting system problems.

- Classifying problems.

- Tracking the occurrence and resolution of problems.

The trouble ticket system is managed by a computer software package called Remedy. Remedy's Action Request System provides a distributed trouble ticket system that furnishes ECS centers (e.g., Systems Monitoring Center (SMC) and DAACs) with a common means of classifying, tracking, and reporting both the occurrence of problems and their resolution to system users and operations personnel. The trouble ticket system performs the following functions:

- Provides a graphical user interface (GUI) that provides operations personnel with access to all trouble ticketing systems.

- Provides a common trouble ticket entry format.

- Stores trouble tickets.

- Retrieves trouble tickets upon request.

- Allows operations personnel to forward problem reports from one ECS center to another.

- Produces stock and common reports on system problems.

- Provides interfaces with users' and operators' e-mail to provide automatic notification of events that affect a trouble ticket (such as logging in of a newly submitted trouble ticket or "close-out" (completion) of a trouble ticket).

- Offers an application programming interface through which system computer programs can automatically submit trouble tickets.

- Provides summary information to the SMC from each DAAC to allow SMC personnel to prepare trend reports on system problems.

- Defines a consistent "life cycle" (from submittal to completion) for trouble tickets.

625-EMD-003, Rev. 02

- Allows each ECS center to customize local trouble ticket escalation and action rules.
    - Escalation rules are time-activated events.
    - When a trouble ticket meets whatever conditions are specified in the rules, the trouble ticket system takes the designated action. For example:
        · Notification (of either a user or support staff member).
        · Writing to a log file.
        · Setting a field value on the trouble ticket.
        · Running a custom-written process.

In addition to the functions performed by Remedy's Action Request System, the trouble ticket system provides other methods of submitting and/or keeping track of trouble ticket status.

- Set of custom hypertext markup language (HTML) documents.
    - Allow registered users to submit new trouble tickets and determine the current status of any of their previous trouble ticket entries via the Internet (*Note*: Some sites have elected not to use this capability).
- Text e-mail template.
    - Allows automated entry of trouble ticket information (*Note*: Some sites have elected not to use this capability).
- Contacting a User Services representative at one of the DAACs.
    - By telephone.
    - In person.

In addition to tracking trouble tickets, the Remedy Action Request System provides a User Contact Log for User Services representatives.

- There is a separate form (GUI) that accepts the entries which User Services personnel enter for each contact they have with system users.
- A button on the User Contact Log form allows the User Services representative to automatically fill out a new trouble ticket simply by clicking on the button.
    - Clicking the button transfers data from the contact log to the appropriate fields on a trouble ticket form.

## Writing/Submitting Trouble Tickets

The particular method that a person who is submitting a trouble ticket uses depends on whether the person submitting the trouble ticket is an internal or external user.

- External users submit trouble tickets either through the HTML documents, e-mail template, or by contacting User Services.

- Internal operators and users of the system submit trouble tickets using the Remedy Action Request System.

Because this course is intended for internal personnel, only the use of Remedy is described in this lesson.

The trouble ticket system is wholly automated.

- TTs are handled electronically.
    - Common distributed-access database system.
    - Remedy is the Trouble Ticket database tool at the sites.
- Supporting documentation for a trouble ticket must be handled separately.
    - It is not possible to attach a file in the Trouble Ticket form (the new version of Remedy permits specification of an attachment field, but the Trouble Ticket application is not currently configured for attachments).
    - Supporting documentation in electronic form (e.g., computer files) must be sent to the local trouble ticket system administrator.  (Attach an e-mail message identifying the corresponding trouble ticket number, submitter identification and any other relevant information.)
    - The Configuration Management Administrator (CMA) at each site serves as trouble ticket system administrator.
    - Supporting documentation **not** in electronic form (if any) is handled by the local trouble ticket system administrator and is listed as an attachment to the trouble ticket.

The procedure for writing and submitting a trouble ticket is performed by any internal system user or operator who needs to submit a trouble ticket to have an operating problem investigated. The procedure starts with the assumption that the applicable servers are running and the user or operator has logged in to the system.

Access to Remedy is gained through the use of UNIX commands, as reflected in the following procedure for launching Remedy.  This procedure is applicable for launching Remedy locally at a DAAC; developers or support personnel at the ECS Development Facility or at the SMC may need to use a different login procedure.

**Launching the Remedy Trouble Ticket Application**

---

**1**    Access the command shell.

- The command shell prompt is displayed.

**NOTE:**    Commands in Steps 2 through 7 are typed at a UNIX system prompt.

**2**    Type **setenv DISPLAY** *clientname***:0.0** then press the **Return/Enter** key.

- Use the terminal/workstation IP address or the machine-name for the *clientname*.

**3**      Start the log-in to the client host by typing either **/tools/bin/ssh** *hostname* (e.g., **e0ins01**, **g0ins01**, **l0ins01**, **n0ins02**) and then press the **Return/Enter** key.

- If you receive the message, **Host key not found from the list of known hosts.  Are you sure you want to continue connecting (yes/no)?**  type **yes** ("**y**" alone does not work) and then press the **Return/Enter** key.

- If you have previously set up a secure shell passphrase and executed **sshremote**, a prompt to **Enter passphrase for RSA key '*<user@localhost>*'** appears; continue with Step 5.

- If you have not previously set up a secure shell passphrase, go to Step 6.

**4**      If a prompt to **Enter passphrase for RSA key '*<user@localhost>*'** appears, type your *Passphrase* and then press the **Return/Enter** key.  Go to Step 7.

**5**      At the *<user@remotehost>***'s password:** prompt, type your *Password* and then press the **Return/Enter** key.

**6**      Type **cd /***path* then press the **Return/Enter** key.

- Change directory to the path (e.g., **/usr/ecs/*<MODE>*/COTS/remedy/bin**) containing the Remedy command files.

- The *<MODE>* will most likely be one of the following operating modes:

  – **OPS** (for normal operation).

  – **TS1** (for testing).

  – **SHARED** (for other uses).

- Note that the separate subdirectories under **/usr/ecs** apply to different operating modes.

**7**      Type **aruser &** then press **Return/Enter**.

- If you are a first-time user, a login window is displayed; enter your Remedy user ID and password.

- A Remedy Action Request System logo window is displayed briefly, followed by a Remedy initial screen from which a number of custom application forms, including the Trouble Ticket application, may be launched.

**8**   Follow menu path **File→Open** or click on the leftmost button near the top of the window.

- The **Open** dialog box (Figure 1) is displayed, showing choices including: **RelB-Contact Log**, **RelB-TT-ForwardToSite**, **RelB-TroubleTickets**, and **RelB-TT-ForwardToSMC**.

**9**   Click on **RelB-Trouble Tickets** to highlight it and then click on the **New** button.

- The **New RelB Trouble Tickets** window (Figure 2) is displayed.
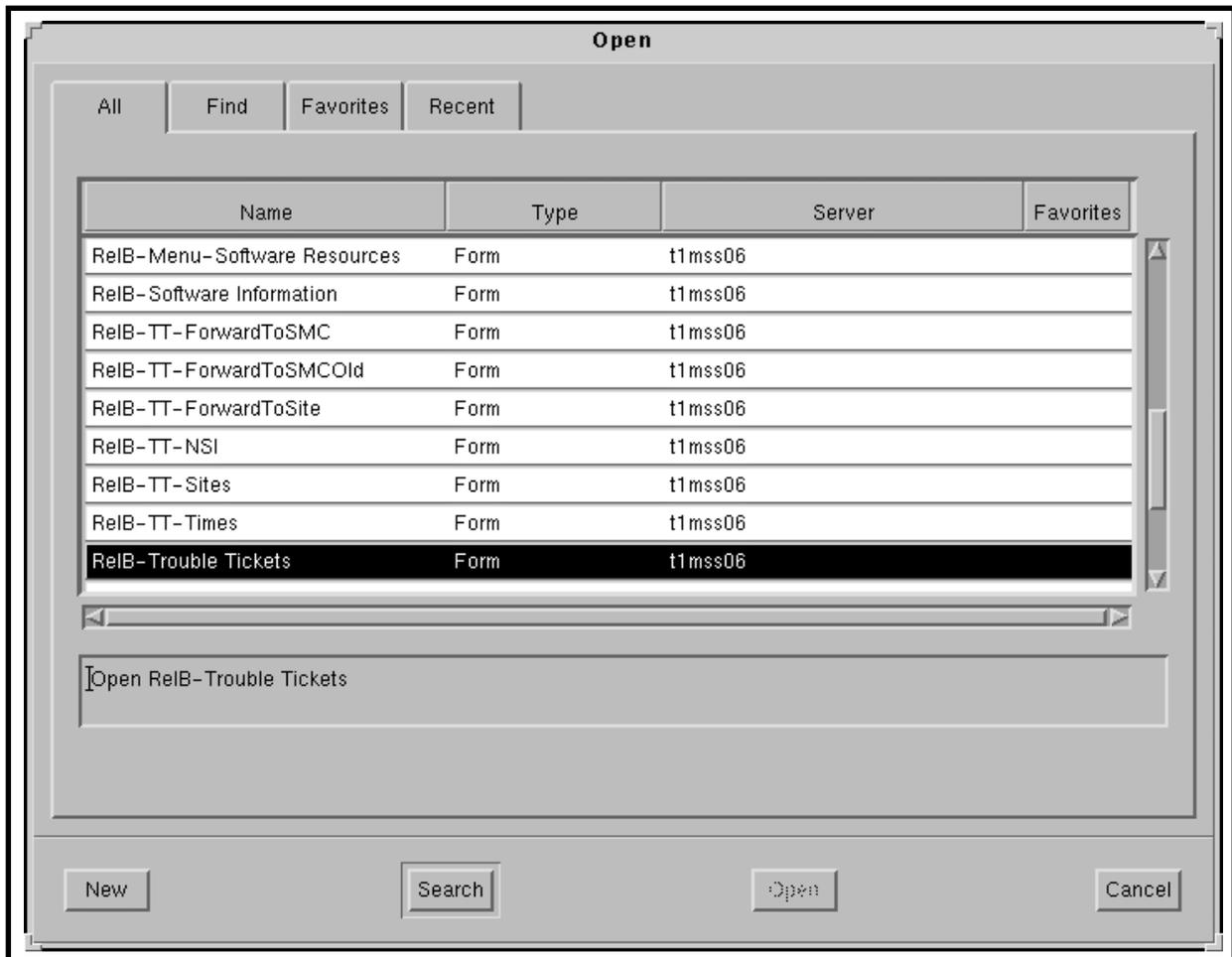
*Figure 1. "Open" Window (Not all choices may appear)*

*Figure 2. Release B Trouble Tickets Form*

The basic steps of the procedure for writing a trouble ticket are as follows:

**Writing a Trouble Ticket**

**1**      Launch the **Trouble Ticket** application as described in the procedure **Launching the Remedy Trouble Ticket Application** (previous section of this lesson).

- A Remedy Action Request System logo window is displayed briefly, followed by a Remedy initial screen from which a number of custom application forms, including the Trouble Ticket application, may be launched.

**2**      Follow menu path **File→Open** or click on the leftmost button near the top of the window.

- The **Open** dialog box is displayed, showing choices including: **RelB-Contact Log**, **RelB-TT-ForwardToSite**, **RelB-TroubleTickets**, and **RelB-TT-ForwardToSMC**.

**3**      Click on **RelB-TroubleTickets** to highlight it and then click on the **New** button.

- The **New RelB-TroubleTickets** window is displayed.

**4**     Click on the **Short Description** field.

- The cursor is displayed in the **Short Description** field.

**5**     Type a short description of the problem (up to 128 characters) in the **Short Description** field; try to capture the essence of the problem in a few words.

- **Short Description** is a mandatory entry.

- The **Short Description** field and some other fields have a document icon associated with them so you can click on the icon and open a window in which you can type information at length.

**6**     Place the mouse cursor on the **Submitter ID** pick-list icon.  Press the left mouse button and move the cursor down the list until your ID is highlighted; then release the mouse button to transfer your ID into the **Submitter ID** field.

- Remedy will automatically fill in the following fields when you actually submit the TT:

   - Submitter Name.

   - Submitter Phone [number].

   - Submitter eMail [address].

   - Submitter Home DAAC.

- If your name is not on the pick-list, you must type the information in all of the preceding fields.

- If you have any questions concerning what should be entered in any of the identification fields, ask the trouble ticket system administrator.

**7**     Click and **hold** on the **Submitter Impact** option button to display a menu of "impacts."

- The following menu of impact codes is displayed:

   - High.

   - Medium.

   - Low.

- **Submitter Impact** is an optional field, but is used to indicate problem severity.

- Default value (**Low**) is set automatically if you do not make a selection in this field.

**8**     Select the desired impact code by moving the cursor to the desired code in the menu to highlight it, then release the mouse button.

- Selected code is displayed on the **Submitter Impact** option button.

**9**     Fill in the any of the following optional fields that provide useful information for the problem investigation:

- **Long Description** (description of the problem using up to 4060 characters).  This is the place to provide data on frequency of occurrence, time and people required for recovery/workaround, impact on daily/weekly quotas, and how soon the fix is needed.

- **Key Words** (up to 255 characters).  ECS required; enter the mode and release (e.g., **OPS:7.0**).

- **Software Resource** (software with which the problem originated).

- **Hardware Resource** (hardware from which the problem came).

**10**    When you are satisfied that the information in the trouble ticket fields is correct, click on the **Save** button near the upper right corner of the window (or follow menu path **Actions→Save**) to submit the TT.

- TT is entered into the Remedy database.

- A message **Submit successful: ID=<*site*><*nnn . . .*>** to indicate the submission and provide the Trouble Ticket ID number.

- Remedy will send you an e-mail message to confirm that the trouble ticket has been entered into the database.

  - If you do not receive confirmation, you should contact the trouble ticket system administrator.

**11**    To exit from the **Remedy Action Request System**, follow menu path **File→Exit**.

**12**    If it is necessary to provide back-up information/documentation, such as a file that illustrates the problem, send the documentation to the trouble ticket system administrator.

- Send an e-mail cover message that contains the following information:

  - Trouble ticket number (Ticket-Id).

  - Submitter ID.

  - Relevant information concerning the attachment.

This page intentionally left blank.

# Documenting Changes

## Reviewing and Modifying Trouble Tickets

Trouble tickets must be modified as the problem resolution process progresses and the various parties involved in the process have to make entries on the trouble ticket, for example:

- Assignment to a technician for problem resolution.

- Resolution Log entries.

- Changes of status.

- Forwarding to another site.

The changes are the result of better understanding of the nature of problems, proposed and revised solutions resulting from the investigation, or Problem Review Board decisions.

Access to trouble ticket data is controlled by the database administrator for the trouble ticket system. The database administrator assigns each user of Remedy's Action Request System certain access privileges.

- Access privileges determine which trouble ticket fields (if any) you can modify.

- Examples:

    − Some operators will be allowed only permission to submit TTs.

    − Operations Supervisor must be able to submit TTs, modify ticket status, assign priority, assign the TT to a specific investigator, and make many other modifications.

Reviewing or modifying TTs is done using the Remedy **Modify RelB-TroubleTickets** window. This window, illustrated in Figure 3, is obtained from the **Search RelB-TroubleTickets** window, which looks very similar but does not have the **Matching RelB-TroubleTickets** field at the top.
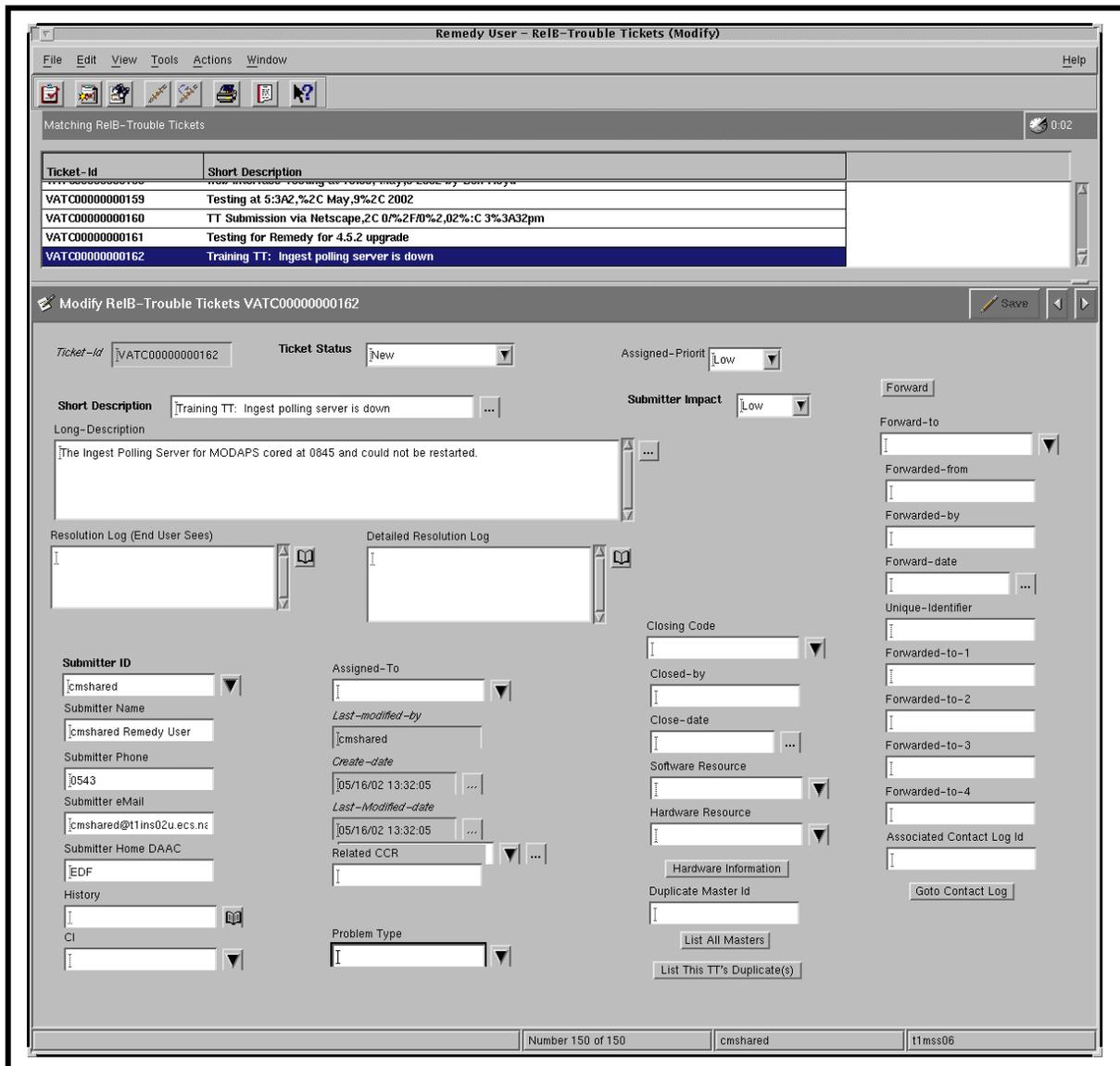
*Figure 3.  Remedy Modify RelB-TroubleTickets window*

The basic steps of the procedure for reviewing or modifying TTs through Remedy are as follows:

**Reviewing and Modifying Open Trouble Tickets**

---

**1**     Access the **Remedy User Tool** by performing the procedure **Launching the Remedy Trouble Ticket Application** described earlier in this lesson.

- A Remedy Action Request System logo window is displayed briefly, followed by a Remedy initial screen from which a number of custom application forms, including the Trouble Ticket application, may be launched.

**2**     Follow menu path **File→Open** or click on the leftmost button near the top of the window.

- The **Open** dialog box is displayed, showing choices including: **RelB-Contact Log**, **RelB-TT-ForwardToSite**, **RelB-TroubleTickets**, and **RelB-TT-ForwardToSMC**.

**3**     Click on **RelB-TroubleTickets** to highlight it and then click on the **Search** button.

- *Note*: If you have the **New RelB-TroubleTickets** window open before this step, you can achieve the same result by following menu path **Actions→New Search**.

- The **Search RelB-TroubleTickets** window is displayed; the fields are empty.

**4**     If the trouble ticket to be modified has some characteristic that will allow you to restrict the system's querying of the database, enter the data in the corresponding field on the **Search RelB-Trouble Tickets** window.

- For example, you may restrict querying to only those trouble tickets that have a high assigned priority and have been submitted within the last three days.

- The search query function is case sensitive. One good and probably frequently used approach is to enter the trouble ticket ID number (if you know it) in the **Ticket ID** field.

- The **Advanced** search button near the upper right corner of the window provides access to a form for entering Boolean search criteria.

**5**     Follow menu path **Actions→Search** (or click on the **Search** button near the upper right corner of the window).

- If you follow this menu path with nothing entered in any of the fields on the **Search RelB-TroubleTickets** window, Remedy displays the **Modify RelB-TroubleTickets** window; the fields are empty and a list of all trouble tickets in the database is available near the top of the window. You may scroll through the list of trouble tickets by using the scroll bar on the right side of the list. You can modify the size of this list field by moving the short horizontal control bar at the right side of the window sash under the field. You may choose to scroll through the list and click on a trouble ticket to select it instead of entering search data as in Step 4.

- The fields of the **Modify RelB-TroubleTickets** window display data for the searched or selected trouble ticket.

**6**     Review and/or modify the trouble ticket fields as necessary.

- The fields are described in Table 1 (extracted from 609-EMD-001, *7.11 Operations Tools Manual for the EMD Project*.)

- Some of the fields (e.g., **Submitter ID**, **Assigned-To**, **Closing Code**) have pick-list icons associated with them so you can click on the pick-list icon and highlight the text to be entered in the field.

- Some of the fields (e.g., **Detailed Resolution Log**, **History**) have diary or document icons so you can open a window in which you can type information at length.

7    If you wish to forward the TT to another ECS center, you must first click on the pull-down arrow at the right of the **Ticket Status** field and select **Forwarded** from the pull-down menu.

- You must be authorized to forward TTs.

8    When forwarding a TT to another ECS center, select the TT's destination using the **Forward-to** field pick list then click on the **Forward** button.

- Be sure to go to the next step (saving the change) or there will be no local record that the TT was forwarded.

- If you forward a TT to another center, it will receive a new **Ticket-Id** at that center and the original identifier will be transferred to the **Unique-Identifier** field.

- The TT will retain its original **Ticket-Id** at your center.

9    When you are satisfied that the information in the trouble ticket fields is correct, click on the **Save** button to make the changes effective.

10   To exit from the **Remedy Action Request System**, follow menu path **File→Exit**.

*Table 1. Trouble Ticket Field Description (1 of 3)*

| Field Name | Data Type | Size | Entry | Description |
|---|---|---|---|---|
| Ticket-Id | Character | 15 | System generated | Ticket number that is set and maintained by the system. |
| Ticket Status | Selection | * | Required | Status of the trouble ticket. |
| Assigned-Priority | Selection | * | Optional | Priority of trouble ticket assigned at the site (HIGH, MEDIUM, LOW). |
| Short Description | Character | 128 | Required | Short description of the problem. |
| Submitter Impact | Selection | * | Required | Impact of the problem to the submitter. |
| Long-Description | Character | 4060 | Optional | Long description of the problem. |
| Resolution Log (End User Sees) | Diary | Unlim | Optional | General steps in the resolution of the problem. |
| Detailed Resolution Log | Diary | Unlim | Optional | Detailed steps in problem resolution. |
| Submitter ID | Character | 30 | Required | User Id of the Submitter. |
| Submitter Name | Character | 30 | Optional | Full Name of the Submitter. |
| Submitter Phone | Character | 30 | Optional | Phone number of the Submitter. |
| Submitter eMail | Character | 64 | Optional | E-mail address of the Submitter. |
| Submitter Home DAAC | Character | 60 | Optional | Home DAAC of the Submitter. |

## Table 1. Trouble Ticket Field Description (2 of 3)

| Field Name | Data Type | Size | Entry | Description |
|---|---|---|---|---|
| History | Diary | Unlim | Optional | Upon submission or modification, the person assigned to the ticket and the ticket status will be indicated in the History field. Due to a limitation in Remedy, this information is only written when the Assigned-to and Status fields are modified. |
| CI | Character | 30 | Optional | Name of the configuration item to which the problem is associated. |
| Assigned-To | Character | 30 | Optional | Person to whom Trouble Ticket has been assigned. |
| Last-modified-by | Character | 30 | System generated | Person who last modified the Trouble Ticket. |
| Create-date | Date/Time | 17 | System generated | Date and time Trouble Ticket was created at the present site (mm/dd/yy hh:mm:ss). |
| Last-Modified-date | Date/Time | 17 | System generated | Date and time the trouble ticket was last modified (mm/dd/yy hh:mm:ss). |
| Related CCR | Character | 60 | Optional | ID of a related CCR. [If more than one CCR, separate CCRs by a space for readability.] |
| Key Words | Character | 255 | Optional | Key words to help identify this Trouble Ticket. |
| Problem Type | Character | 30 | Optional | Type of problem addressed by this Trouble Ticket (e.g., configuration error, hardware problem, software problem). |
| Closing Code | Character | 60 | Optional | Code assigned to the type of problem that necessitated the writing of this Trouble Ticket. |
| Closed-by | Character | 60 | Optional | Person who closed this Trouble Ticket. |
| Close-date | Date/Time | 17 | Optional | Date and time this Trouble Ticket was closed (mm/dd/yy hh:mm:ss). |
| Software Resource | Character | 60 | Optional | Software resource that the problem came from. |
| Hardware Resource | Character | 60 | Optional | Hardware resource that this problem came from. |
| Duplicate Master Id | Character | 25 | Optional | The Ticket-ID of the primary Trouble Ticket for the problem reported in this Trouble Ticket and its associated duplicate Trouble Tickets (other tickets reporting the same problem). |
| Forward-to | Character | 60 | Optional | Site that this Trouble Ticket was last forwarded to. |
| Forwarded-from | Character | 60 | Optional | Site that forwarded this Trouble Ticket. |
| Forwarded-by | Character | 60 | Optional | Contact person at the forwarding site. |
| Forward-date | Date/Time | 17 | Optional | Date and time Trouble Ticket was forwarded (mm/dd/yy hh:mm:ss). |

625-EMD-003, Rev. 02

## Table 1. Trouble Ticket Field Description (3 of 3)

| Field Name | Data Type | Size | Entry | Description |
|---|---|---|---|---|
| Unique-Identifier | Character | 20 | Optional | Unique identifier that is established at the origination site. This identifier should NEVER be changed once set. |
| Forwarded-to-1 | Character | 60 | Optional | First site to have been forwarded this Trouble Ticket. |
| Forwarded-to-2 | Character | 60 | Optional | Second site to have been forwarded this Trouble Ticket. |
| Forwarded-to-3 | Character | 60 | Optional | Third site to have been forwarded this Trouble Ticket. |
| Forwarded-to-4 | Character | 60 | Optional | Fourth site to have been forwarded this Trouble Ticket. |
| Associated Contact Log Id | Character | 30 | Optional | ID number of the associated Contact Log entry for this Trouble Ticket. |

*Note, the size of a field with a "selection" data type can vary and the size is automatically adjusted to the size of the item selected from the selection list.

In addition to the fields described in the preceding table, the **RelB-Trouble Tickets** form provides the following active links:

- **Forward**—Forwards the trouble ticket to the site specified in the **Forward-to** field (**Ticket Status** field must be set at **Forwarded**).

- **Hardware Information**—Opens a window that is associated with the trouble ticket to hold hardware information.

- **List All Masters**—All trouble tickets that are duplicates of each other have one master.  This button lists all master trouble tickets.

- **List This TT's Duplicate(s)** -- List all trouble tickets that are duplicates associated with this trouble ticket.

- **Go to Contact Log** --  If the trouble ticket was created from a contact log (User Services), then this button opens a window to that contact log.

# Problem Management

## Control Board Reviews

EMD Problem Management is administered through system-level and site-level control board reviews.

- The control boards oversee the analysis, recommendations, and actions taken to resolve system/site problems concerning hardware, software, documentation, and procedures.

- Operations (OPS) Deployment and the site-level organizations resolve routine maintenance issues at the system-level and site-level, respectively, using the trouble ticket system for tracking system problems.

- Trouble Tickets (TT) may evolve into Non Conformance Reports (NCR), as required, which may then be utilized to generate Configuration Change Requests (CCR) to effect changes to the approved baseline.

- To ensure controlled change, NCRs are tracked using the DDTS in the ECS Development Facility (EDF) and CCRs are tracked manually by Systems Engineering.

The trouble ticket process is the first vehicle used to record and report problems with the operational system.

- Trouble Tickets initially generated at a site, the resolution of which require changes to the system level baseline, are forwarded to the SMC, where they are reviewed and *translated* into NCRs.

- TTs and CCRs that are generated at the sites, which are repaired locally, and result in site-unique extensions to the system level baseline, are forwarded to the SMC for tracking across the EMD baseline.

- The Problem Review Board (PRB) designee is responsible for tracking TTs after they have been received from the sites, and for propagating system problem resolutions for site visibility.

- CMAs also support the activities of the local review board.

  – This includes generating status reports, and implementing resolutions, instructions, and changes as directed by the board.

- User Services Representatives monitor trouble tickets to notify users concerning problem resolution and status.

- Maintenance engineers at respective levels record all activities in the trouble ticket.

  − This information can be used to determine critical maintenance concerns related to frequency of occurrence, criticality level, and the volume of problems experienced.

  − The maintainability analysis guides critical changes, volume and type of support components to be utilized, and focuses further development efforts.

TT submission triggers an internal review by the site's review board.

- Primary objectives of the internal review:

  − Quickly identify and correct problems that fall within the site's capability to maintain, review and validate the priority of the problem.

  − Elevate to the system level those problems that either exceed their capability to repair, or that require a change to the system level baseline.

Problems passed from the sites to the ECS system level, are passed by transferring the trouble ticket from the local trouble ticket system to the SMC trouble ticket system. Here they are reviewed by the EMD Problem Review Board (PRB), which hosts daily teleconferences, known as the PRB Telecon.

The PRB performs a preliminary review of each trouble ticket.

- Confirms the level of impact ( High, Medium, Low) and the Category assigned by the site.

- Checks the completeness of information and data relevant to the problem.

- Determines whether the TT requires a change to the system-level operational baseline.

The PRB has the authority to direct resolutions to trouble ticket problems that do not change (or in any way affect) the EMD operational baseline and baseline documentation.

- An NCR is required when a Technical Investigation (TI) determines that the operational baseline must be changed in order to correct the problem identified in the trouble ticket.

The PRB is not a voting board; the membership is appointed for the purpose of providing timely, direct technical support to the Chair, who has the decision-making responsibility and authority.

The permanent membership of the Problem Review Board is as follows:

- Chair:  DAACHELP Lead or designee.

- Each DAAC:  one member representative.

- .Sustaining Engineering:  one member representative

- ESDIS Operations: one member representative.

Roles and responsibilities of the participants in the PRB Telecon:

- Follow a nominal agenda that includes the following discussions:
    - New trouble tickets.
    - Deferred trouble tickets.
    - Aging high trouble tickets.
    - Review of all Severity 1 (Sev 1) NCRs (OPS and RelB).
    - Review of new OPS NCRs.
    - Review NCRs in the Verified State of DDTS.
- Review severity of each NCR.
- Convert any TTs that identify a system non-conformance and have the appropriate information into an NCR.
    - The DAACHELP requests that the TT be forwarded to the DDTS (Distributed Defect Tracking System).
        - NCRs document the system non-conformance and are worked by the Sustaining Engineering staff.
- NCRs that are deemed to not have enough information for proper adjudication are either rejected as incomplete or they are deferred until a future meeting as determined by the PRB chairperson.
    - The PRB administrator maintains a list of deferred items and places those items on a future PRB agenda after more information is gathered.

The CM Administrator and DAAC Help Desk members provide administrative support to the PRB:

- Publish minutes of teleconference meetings.
- Tracking TTs and action items.
- Translate TTs to NCRs.

NCRs that involve operational baseline changes that are within the scope of the contract (i.e., Class II changes as described in 110-EMD-001, *Configuration Management Plan for the EMD Project*) are evaluated by the Science Development (SCDV) CCB.

- The Science Development (SCDV) CCB has the authority and responsibility to approve Class II changes to the operational baseline.
    - It is not a voting board.

The permanent membership of the SCDV CCB is as follows:

- Chair:  EMD Systems Engineering and Integration Team (SEIT) designee.

- Members of the EMD SEIT and designees.

- Each DAAC:  one representative.

Roles and responsibilities of the SCDV CCB:

- Review, approve and schedule; review and backlog; or reject each NCR's proposed resolution, or cost and schedule input from the Responsible Engineer (RE).

- Approve the schedule for the deployment of configuration changes in the form of a 'drop' to the SMC.

- Approve the content of each block.

- Manage and adjust the schedule and contents of each block in accordance with program priorities and the progress of NCR work-off.

- Review the status of all backlogged NCRs on a periodic basis. Schedule NCRs for a future block as appropriate.

- Collect and report on NCR statistics.

## Assessing/Categorizing Problem Severity

The Remedy Trouble Ticket application provides fields for rating the "Submitter Impact" and "Assigned-Priority" of a problem.  It is intended that the submitter of a trouble ticket use the Assigned Impact field to rate the severity of the problem.  The Assigned-Priority rating may be used at the DAAC for those problems that will be handled locally, but is typically reserved for use by the DAAC Help staff in assigning priorities for handling problems referred to them.

The DAAC Help staff reviews the information provided by the DAAC to determine if the problem has been described in enough detail to warrant the recommended severity.  If there is insufficient information, the DAAC submitter or point of contact is contacted for additional input.

In determining severity of the problem, the DAAC Help staff considers the following factors:

- Impact on the ability to ingest, process or distribute satellite data.

- Frequency of occurrence.

- Availability of an adequate work-around.

The priority categories are approximately equivalent to categories specified in the Performance Assurance Requirements document [*EOS Performance Assurance Requirements for ECS,* Goddard Space Flight Center (GSFC) 420-05-03].  Table 2 shows the categories identified in the Performance Assurance Requirements and specific definitions applied by the EMD Project to assign priorities.  The table also illustrates that low priority problems may be assigned to additional classifications as the problems are documented in NCRs.

### Table 2.  Trouble Ticket Priority/NCR Severity

| As Documented in NASA 420-05-03 | As Used/Interpreted by the EMD Project |
|---|---|
| **Category 1:  System/Service cannot perform critical function or imposes major safety hazard.  (Priority 1)**<br>Presents an immediate impact to development, operations, services, or data processing functions; imposes major safety hazard to personnel, systems, or space mission resources; or results in loss of one or more essential mission objectives. | **HIGH (Severity 1)**:  An NCR which causes:<br>_ Inability to perform a mission-critical function (i.e., Ingest/Pre-Processing/Archiving of Science Data, Planned Processing, Browse/Order/Distribute);<br>_ Performance of a mission-critical function to be so degraded that production minimum goals cannot be achieved;<br>_ A mission-critical function to be performed improperly, resulting in permanent loss of data;<br>**and** for which no workaround exists **or** for which no workaround can be accommodated by DAAC operators given a detailed workaround procedure is documented but the procedure is inadequate based upon the complexity of the procedure, the abilities of an adequately trained and experienced operator, or both. |
| **Category 2:  System/Service substantially impaired.  (Priority 2)**<br>Substantially impacts development, operations, services, or data processing functions; fails to operate within critical performance specifications; or cannot effectively or efficiently fulfill baseline requirements. | **MEDIUM (Severity 2)**:  An NCR with the consequence that:<br>_ The performance of a mission-critical function is degraded and may prevent achieving production minimum goals;<br>_ A mission-critical function can be only partially performed, or performs improperly, resulting in temporary loss of data or incorrect data results;<br>_ A situation (actually or potentially) severly compromises ECS mission readiness or operational integrity;<br>_ A condition exists to produce a severely degraded mission-critical function, but a workaround will allow operations to continue temporarily without permanent loss of data or severely impaired performance/workload/schedules. |
| **Category 3:  System/Service slightly impaired.  (Priority 3)**<br>Causes minor or no substantial impact to development, operations, services, or data processing functions.  Support may be degraded, but mission can still be accomplished. | **Severity 3**:  An NCR with the consequence that:<br>_ A non-critical mission function (e.g., Advertising) cannot be performed, or yields incorrect results;<br>_ Unexpected events occur which can be corrected using normal operational procedures with minimal impacts to performance/workloads/schedules<br>_ A condition exists to produce a degraded mission-critical function, but a workaround will allow operations to continue indefinitely without severely impaired performance/workload/schedules. |
| | **Severity 4**:  Improvement (Nuisance; e.g., a typo). |
| | **Severity 5**:  Enhancement (Identified for next release). |

This page intentionally left blank.

# Practical Exercise

This exercise is intended to give the students practice in writing a trouble ticket, getting access to an existing trouble ticket and changing the information in trouble ticket data fields.

**Equipment and Materials**

One workstation per student.

Statement of the requirements for the exercise.

*Release 7.11 Operations Tools Manual for the EMD Project,* 609-EMD-001, one copy per student.

*Release 7.11 Mission Operation Procedures for the EMD Project,* 611-EMD-001, one copy per student.

## Writing a Trouble Ticket

The exercise involves the writing of a trouble ticket. The exercise begins with an operator becoming aware that a network is running too slowly. The operator prepares and submits a trouble ticket.

Perform the following steps:

1. Prepare a trouble ticket stating that the network is running too slowly.

2. Submit the trouble ticket.

## Documenting Trouble Ticket Changes

The exercise requires the student to locate a particular trouble ticket, make changes in trouble ticket fields, and have the changes applied to the trouble ticket.

Perform the following steps:

1. Display the specified trouble ticket on the workstation screen.

2. Make entries in the Detailed Resolution Log and Resolution Log indicating a solution to the problem.

3. Change the Ticket Status to "Solution Proposed".

4. Apply the changes to the trouble ticket.

## Documenting Failures and Severity

The exercise requires the student to evaluate trouble tickets and critique the description and assignment of severity.

1.      The following is an example long description from a trouble ticket, severity *medium*:

AMASS 4.12.3   Forced device buffered I/O flush. Free Cache Block Count starvation. This error was not due to a heavy load.  It occurred during the morning ingest and amass cache with the installation on 4.12.3 version. I talked to John Doe and he will see about more raid for AMASS.

Technician spoke with John Doe and he stated "that this one can be turned into an NCR to replace 20  4-GB RAID drive with 20  9-GB RAID drive."  (Also, as a heads-up:  We will need different RAID drive for the ORIGIN also once we move the data across.)

ISSUES related to the delivery of AMASS 4.12.3:  1) cache flush, 2) additional logging set in the version of AMASS delivered, 3) ECS tested and should have sent the low level logging AMASS; Why did we get this version?  What is the impact? Why were we not told about the cache issue and logging issue in PSR?  And are we off baseline? Or is this the new baseline?

IMPACT:  Does not seem to be major yet; however, we have not fully characterized the Cache Flush and the additional logging (related to functionality and performance).

How does this trouble ticket stack up against a checklist for completeness and accuracy?  (i.e., Does it provide a clear statement of the problem?  How often does the problem happen?  Is recovery possible?  How long does recovery take, and how many people are required?  Is a workaround available?  How long does the workaround take, and how many people are required?  What is the impact on daily/weekly quotas?

2.      Here is another example long description from a trouble ticket, severity *high*:

Currently, for FtpPull requests, if granules for a request were successfully staged and a notification msg went out to the user, the request is marked as "shipped."  However, it should be marked "staged and notified."  When the user actually retrieves the files successfully, only then it should be marked as "shipped."

To find out if files have been retrieved, certain software is needed to look into an ftp log file, find an ftp session dealing with the files from the request, and based on the ftp session completion status, mark the request.  If EMD is not going to support this software development, a DUE option should be considered.

Without this functionality our distribution people will have a hard time identifying "failed" requests and troubleshooting FtpPull problems.

Any distribution report/metrics concerning users coming through EDG are incorrect.

Assess the completeness and accuracy of the description, and the assigned severity.

# Slide Presentation

## Slide Presentation Description

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

625-EMD-003, Rev. 02

This page intentionally left blank.