

PROBLEM MANAGEMENT

ECS Training

Overview of Lesson



- **Introduction**
- **Writing a Trouble Ticket (TT)**
- **Documenting Changes**
- **Problem Resolution**
- **Liaison with the ECS System Operational Support (SOS) Help Desk and Processing a TT through the Problem Resolution Process**
- **Making Emergency Fixes**
- **Practical Exercises**
 - **Writing a Trouble Ticket**
 - **Documenting TT Changes**

Objectives



- **OVERALL:**
 - Develop proficiency in trouble ticketing and problem resolution procedures
- **SPECIFIC:**
 - Submit a trouble ticket (TT) with enough information to enable correct assignment of severity
 - Make changes to an existing TT
 - Describe the steps in the routine problem resolution process
 - Describe the process of liaison with the SOS Help Desk and processing a TT through the problem resolution process
 - Describe the process of making emergency fixes
- **STANDARD:**
 - Mission Operation Procedures for the ECS Project - 611-CD-610-002

Importance



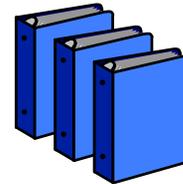
- **All internal users of ECS are affected**
- **If a problem occurs with ECS hardware, software, documentation, or procedures, it is necessary to apply problem management tools and procedures**
- **Clear and complete inputs to the SOS Help Desk determine correct assignment of severity to ensure effective support in problem resolution**

Writing a Trouble Ticket (TT)



- **Electronic document for:**
 - Reporting/recording problems
 - Recording an idea for a system enhancement
- **Problems affect the following ECS components:**

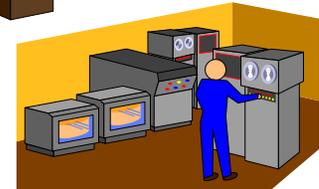
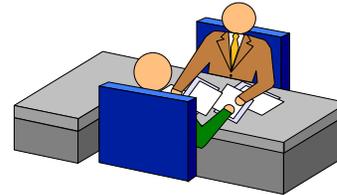
- hardware
- software
- technical documents
- procedures



Writing a Trouble Ticket (Cont.)



- **TTs may be submitted by...**
 - users in the science community
 - ECS operators/staff
 - ECS developers



- **Trouble Ticket states:**
 - new
 - assigned
 - solution proposed
 - implement solution
 - solution implemented
 - closed
 - forwarded
 - work around
 - not repeatable

Writing a Trouble Ticket (Cont.)



- **If a configuration change is required, a Configuration Change Request (CCR) is prepared.**
 - provides documentation for the configuration management process
 - a TT leads to a CCR only when a configuration change is proposed (e.g., changing a baselined system Configuration Parameter)

Writing a Trouble Ticket (Cont.)



- **ECS Trouble Ticketing System provides a consistent means of...**
 - reporting ECS problems
 - classifying problems
 - tracking the occurrence and resolution of problems

Writing a Trouble Ticket (Cont.)



- **Trouble Ticketing System**
 - managed by Remedy's Action Request System
 - provides Graphical User Interface (GUI)
 - provides a common entry format
 - stores TTs
 - retrieves TTs
 - transfers TTs between facilities
 - produces reports
 - provides e-mail interface (automatic notification)
 - provides application programming interface
 - provides summary information to SMC
 - defines TT "life cycle"
 - allows customized local escalation and action rules

Writing a Trouble Ticket (Cont.)



- **Trouble Ticketing System - methods of submitting TTs or checking TT status:**
 - **Remedy (Action Request System)**
 - **custom hypertext markup language (HTML) documents**
 - **text e-mail template**
 - **contacting a User Services representative at one of the DAACs**
 - **by telephone**
 - **in person**

Writing a Trouble Ticket (Cont.)



- **User Services - Contact Log**
 - separate Remedy form (GUI) for recording user contacts
 - clicking a button transfers data from the contact log to the appropriate fields on a trouble ticket form

Writing a Trouble Ticket (Cont.)



- **Writing/Submitting Trouble Tickets**
 - **external users**
 - HTML documents
 - e-mail template
 - contacting User Services
 - **internal operators and users**
 - Remedy Action Request System

Writing a Trouble Ticket (Cont.)



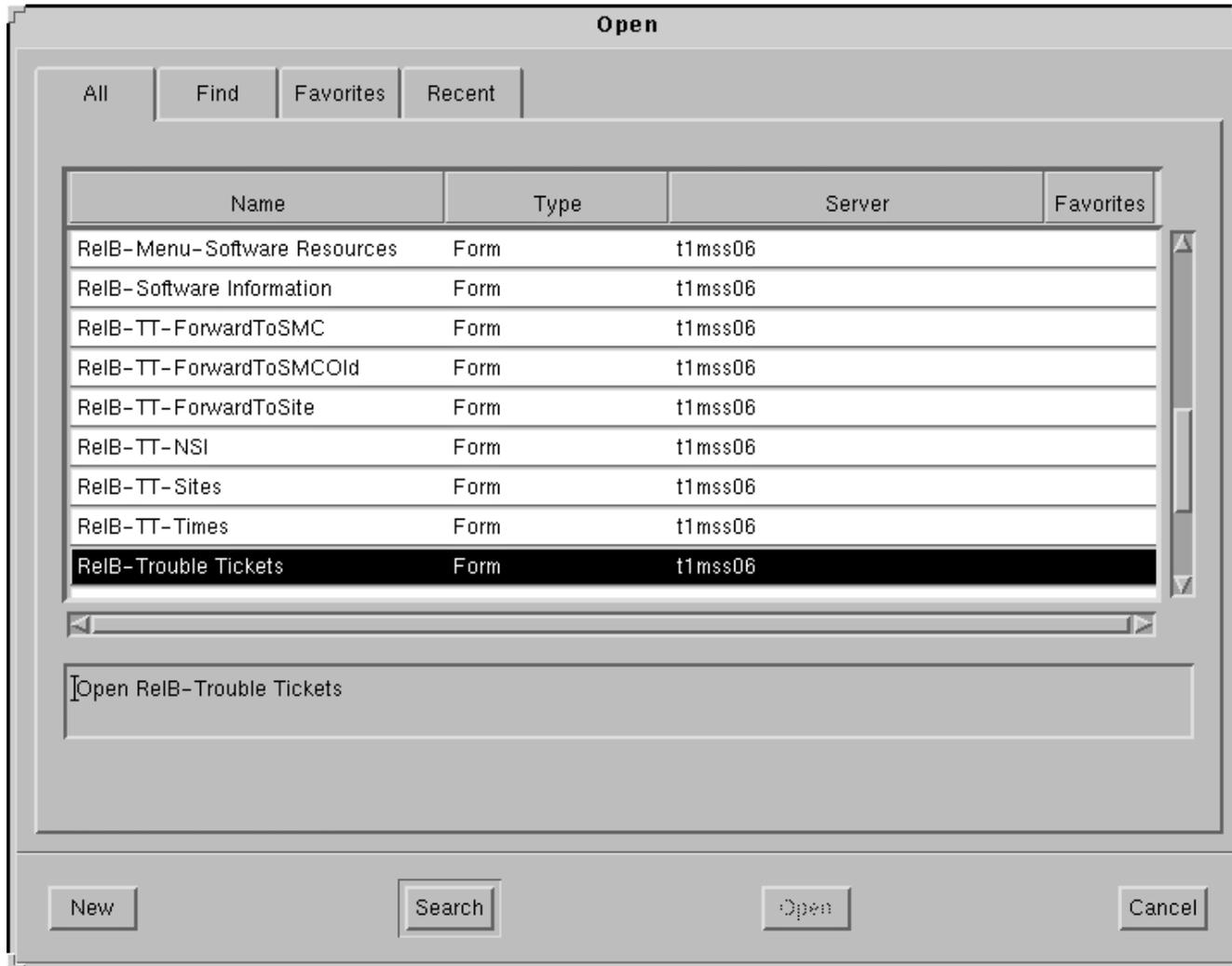
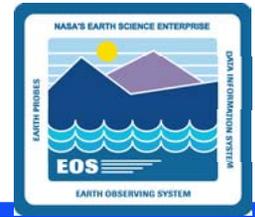
- **TTs are handled electronically**
 - common distributed-access database system
 - Remedy is the database tool
- **Supporting documentation must be handled separately**
 - not possible to attach a file in Remedy
 - via e-mail to the TT database administrator
 - sending/giving it to the TT database administrator
 - SMC Configuration Management (CM) Administrator
 - SEO/SOS Support Personnel
 - DAAC Operations Readiness and Performance Assurance Analyst

Writing a Trouble Ticket (Cont.): Procedure



- **Launch Remedy User Tool**
 - Follow procedure to access Remedy
- **Log in if first-time user**
- **Open RelB-Trouble Tickets Form**
 - File menu
 - Open
 - Click “New” Button

Writing a Trouble Ticket (Cont.): “Open” Window



Note: Not all choices may appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Release B Trouble Tickets Form



Remedy User - ReIB-Trouble Tickets (New)

File Edit View Tools Actions Window Help

New ReIB-Trouble Tickets Save

Ticket-Id: VATC Ticket Status: New Assigned-Priority: Low

Short Description: Training TT: Ingest polling server is down Submitter Impact: Low

Long-Description: The Ingest Polling Server for MODAPS core'd at 0845 and could not be restarted

Resolution Log (End User Sees) Detailed Resolution Log

Submitting Information:

- Submitter ID: cmshared
- Submitter Name: cmshared Remedy User
- Submitter Phone: 0543
- Submitter eMail: cmshared@t1ins02u.ecs.nasa.gov
- Submitter Home DAAC: EDF
- History: [empty]
- CI: [empty]

Assigned-To: [empty] Last-modified-by: [empty] Create-date: [empty] Last-Modified-date: [empty] Related CCR: [empty]

Problem Type: [empty]

Closing Code: [empty] Closed-by: [empty] Close-date: [empty] Software Resource: [empty] Hardware Resource: [empty] Duplicate Master Id: [empty]

Forward:

- Forward-to: [empty]
- Forwarded-from: [empty]
- Forwarded-by: [empty]
- Forward-date: [empty]
- Unique-Identifier: [empty]
- Forwarded-to-1: [empty]
- Forwarded-to-2: [empty]
- Forwarded-to-3: [empty]
- Forwarded-to-4: [empty]
- Associated Contact Log Id: [empty]

Hardware Information Goto Contact Log

List All Masters List This TT's Duplicate(s)

cmshared t1mss06

These entries may not appear on your window, depending on your assigned authorizations.

Writing a Trouble Ticket (Cont.): Procedure



- **Type a short description of the problem, trying to capture the essence of the problem in a few words**
 - Short Description field
- **Fill in Submitter ID**
 - Submitter ID field
 - Use pick-list
- **Select Submitter Impact (Perceived Problem Severity)**
 - High, Medium or Low
 - Required
 - Low is default

Writing a Trouble Ticket (Cont.)

Procedure (Cont.)



- **Fill in “optional” data (some entries mandatory to support effective problem resolution):**
 - **Long Description**
 - 4060-character field for a full descriptive characterization; this is the place to put information on problem frequency, time and people required for recovery/workaround, impact on daily/weekly quotas, and how soon the fix is needed
 - **Key Words**
 - 255-character field; enter mode and release (e.g., OPS:6B)
 - **Software Resource**
 - **Hardware Resource**
- **Verify data**
- **Submit the TT**
 - click on the **Save** button (or select **Save** from the **Actions** menu)
 - confirmation message appears at bottom of window
 - **Remedy** also sends confirmation by e-mail

Writing a Trouble Ticket (Cont.)

Procedure (Cont.)



- **Exit from the Remedy Action Request System**
 - Select “Exit” from the File menu
- **Send backup information/documentation to the TT database administrator**
 - send e-mail cover message
 - identify TT number
 - provide Submitter ID
 - include relevant information concerning attachments

Documenting Changes



- **Trouble tickets are modified at various stages of problem resolution, for example:**
 - assignment to a technician for problem resolution
 - resolution log entries
 - changes of status
 - forwarding to another site
- **Access privileges**
 - controlled by the database administrator
 - determine which TT fields an operator/user may modify

Documenting Changes (Cont.): Modify ReIB-TroubleTickets Window



Remedy User – ReIB–Trouble Tickets (Modify)

File Edit View Tools Actions Window Help

Matching ReIB–Trouble Tickets 0:02

Ticket-Id	Short Description
VATC0000000159	Testing at 5:3A2,%2C May,9%2C 2002
VATC0000000160	TT Submission via Netscape,2C 0%2F0%2,02%:C 3%3A32pm
VATC0000000161	Testing for Remedy for 4.5.2 upgrade
VATC0000000162	Training TT: Ingest polling server is down

Modify ReIB–Trouble Tickets VATC0000000162 Save

Ticket-Id: VATC0000000162 Ticket Status: New Assigned-Priority: Low

Short Description: Training TT: Ingest polling server is down Submitter Impact: Low Forward

Long-Description: The Ingest Polling Server for MODAPS cored at 0845 and could not be restarted.

Resolution Log (End User Sees) Detailed Resolution Log

Submitter ID: cmshared Submitter Name: cmshared Remedy User Submitter Phone: 0543 Submitter eMail: cmshared@t1ins02u.ecs.nasa.gov Submitter Home DAAC: EDF History: CI: Problem Type:

Assigned-To: Last-modified-by: cmshared Create-date: 05/16/02 13:32:05 Last-Modified-date: 05/16/02 13:32:05 Related CCR: Hardware Information Duplicate Master Id: List All Masters List This TT's Duplicate(s)

Closing Code: Closed-by: Close-date: Software Resource: Hardware Resource: Forwarded-to: Forwarded-from: Forwarded-by: Forward-date: Unique-Identifier: Forwarded-to-1: Forwarded-to-2: Forwarded-to-3: Forwarded-to-4: Associated Contact Log Id: Goto Contact Log

Number 150 of 150 cmshared t1ms06

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Launch Remedy User Tool**
 - Follow procedure to access Remedy
- **Open Search ReIB-TroubleTickets window**
 - File menu
 - Open
 - Click “Search” Button
- **Enter data to define search**
 - Case-sensitive data in fields
 - “Advanced” search using Boolean expression
 - Enter no data to yield list of all tickets in database

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **List TTs and Display Modify Rel-B TroubleTickets window**
 - Click “Search” button or select “Search” from the Actions menu
- **Review/Modify TT fields**
- **If forwarding the TT:**
 - set Ticket Status at Forwarded
 - select (from pick-list) the center to receive the TT
 - click on the Forward button

Documenting Changes (Cont.): Reviewing and Modifying Open TTs



- **Save changes**
 - click on the Save button
- **Exit from the Remedy Action Request System**
 - Select “Exit” from the File menu

Problem Resolution



- **Overview of Problem Resolution**
 - **Every trouble ticket (TT) is logged into the Remedy database for record-keeping purposes**
 - **Each TT is evaluated first at the local center**
 - **determine the severity of the problem**
 - **assign on-site responsibility for investigating the problem**
 - **TTs that can be resolved locally are assigned and tracked at the local center**

Problem Resolution (Cont.)



- **Overview of Problem Resolution (Cont.)**
 - **High-severity problems or those associated with installation are called in to the SOS Help Desk and escalated to the agenda of the Problem Review Board (PRB)**
 - **co-chaired by the Maintenance & Operations (M&O) organization and Development/Sustaining Engineering**
 - **held daily**
 - **functions as the review forum for ECS failures or malfunctions documented as non-conformance reports (NCRs)**
 - **participants discuss TTs referred from the sites to the System Monitoring and Coordination Center (SMC) and coordinate NCR activities within the M&O organization as well as with development, customer, and user organizations**

Problem Resolution (Cont.)



- **Locally, the Operations Supervisor reviews TTs and assigns ratings based on perceived impact**
- **Accurate assessment and documentation (in the Trouble Ticket) of impact/severity is critical**
 - **Incorrect assignment of high rating adversely affects resolution**
 - **Real problems suffer loss of visibility (priority)**
 - **Higher priority development may be deferred**
 - **Development/support resources may be diverted**
 - **Complete information is essential to correct assignment of severity**
 - **How often does the problem happen? (How many times per hour/day/week?)**
 - **How long does it take to recover (or CANNOT RECOVER) or conduct workaround (in minutes or hours)?**
 - **How many people are required to accomplish recovery or workaround?**
 - **What is the impact on daily/weekly quotas? (i.e., How many Ingest/Production/Distribution granules are not achieved, out of the total load?)**

Problem Resolution: Priority/Severity



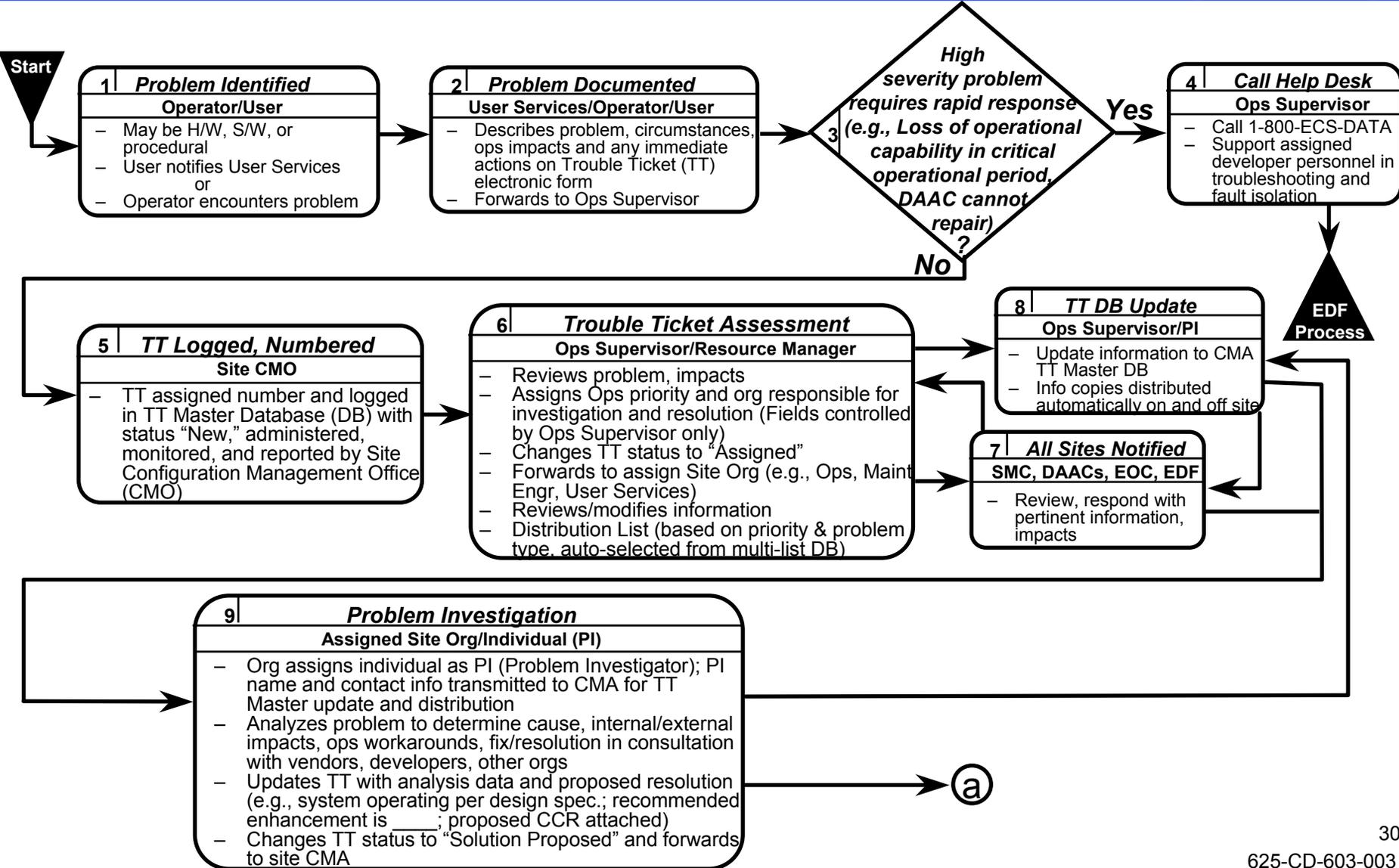
As Documented in NASA 420-05-03	As Used/Interpreted by M&O
<p>Category 1: System/Service cannot perform critical function or imposes major safety hazard. (Priority 1) Presents an immediate impact to development, operations, services, or data processing functions; imposes major safety hazard to personnel, systems, or space mission resources; or results in loss of one or more essential mission objectives.</p>	<p>HIGH (Severity 1): An NCR which causes:</p> <ul style="list-style-type: none"> – Inability to perform a mission-critical function (i.e., Ingest/Pre-Processing/Archiving of Science Data, Planned Processing, Browse/Order/Distribute); – Performance of a mission-critical function to be so degraded that production minimum goals cannot be achieved; – A mission-critical function to be performed improperly, resulting in permanent loss of data; <p>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.</p>
<p>Category 2: System/Service substantially impaired. (Priority 2) Substantially impacts development, operations, services, or data processing functions; fails to operate within critical performance specifications; or cannot effectively or efficiently fulfill baseline requirements.</p>	<p>MEDIUM (Severity 2): An NCR with the consequence that:</p> <ul style="list-style-type: none"> – The performance of a mission-critical function is degraded and may prevent achieving production minimum goals; – A mission-critical function can be only partially performed, or performs improperly, resulting in temporary loss of data or incorrect data results; – A situation (actually or potentially) severely compromises ECS mission readiness or operational integrity; – 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.
<p>Category 3: System/Service slightly impaired. (Priority 3) Causes minor or no substantial impact to development, operations, services, or data processing functions. Support may be degraded, but mission can still be accomplished.</p>	<p>Severity 3: An NCR with the consequence that:</p> <ul style="list-style-type: none"> – A non-critical mission function (e.g., Advertising) cannot be performed, or yields incorrect results; – Unexpected events occur which can be corrected using normal operational procedures with minimal impacts to performance/workloads/schedules – 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.
	<p>Severity 4: Improvement (Nuisance; e.g., a typo).</p>
	<p>Severity 5: Enhancement (Identified for next release).</p>

Problem Resolution: Local (DAAC) TT Review Board



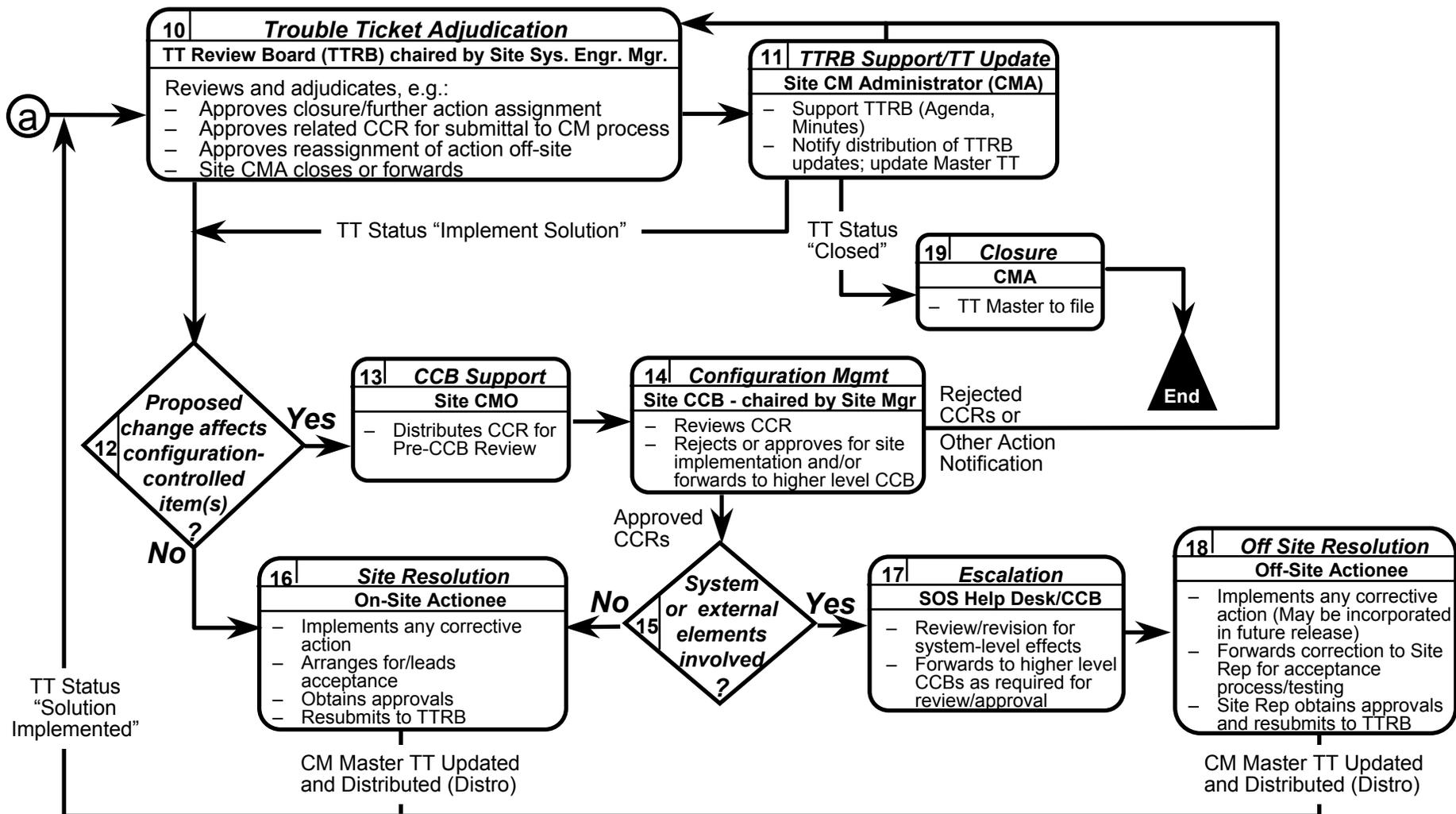
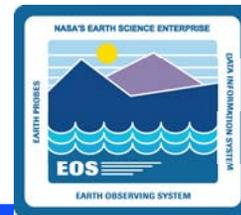
- **Each site establishes TT Review Board (TTRB)**
 - **Considers problems and proposed solutions**
 - **Reviews/approves/modifies locally assigned priorities**
 - **Remedy (TT tool) uses *high, medium, and low* impacts/priorities**
 - **Adjudicates trouble tickets within limits of its authority**
 - **Refers high-severity TTs to SOS Help Desk, SMC, and Problem Review Board; ensures that TTs are written accurately and completely to facilitate handling by SOS**
 - **Manages medium-priority TTs**
 - **Medium- and low-priority TTs may be handled locally**
 - **Problems that affect multiple sites forwarded to SMC**
 - **Generates CCR for system enhancements**
 - **Issues implementing instructions for locally-handled TTs**
 - **Directs closure of TTs for locally fixed and verified problems**

Local Problem Resolution Problem Management Concept Pt. I



Local Problem Resolution (Cont.)

Problem Management Concept Pt. II



Problem Resolution (Cont.): Local Process



- **User/operator discovers problem (Step 1)**
- **User/operator or User Services submits a TT (Step 2)**
- **Operations supervisor decides whether or not problem is high severity and requires a rapid response (Step 3)**
- **If rapid response is required, Operations Supervisor calls 1-800-ECS DATA (Step 4)**
- **Otherwise, Remedy logs TT into system and assigns status (“New”) to initiate administration and monitoring by the Site Configuration Management Office (CMO) (Step 5)**

Problem Resolution (Cont.): Local Process



- **Operations Supervisor reviews TT, assigns local priority, assigns problem to Problem Investigator (PI), and changes TT status to “Assigned” (Step 6)**
- **CM Administrator notifies affected centers (if any) (Step 7)**
 - may forward TT to other center(s)
 - may send e-mail message with information
- **TT database administrator updates database with inputs (Step 8)**

Problem Resolution (Cont.): Local Process



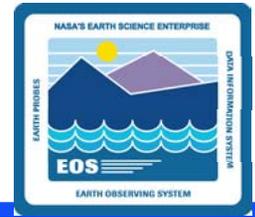
- **PI coordinates inputs from various sources; presents significant issues (if any) at OPS Problem Review Board; updates TT database after finding a proposed solution to the problem; changes TT status to “Solution Proposed” (Step 9)**
- **Local TT Review Board (TTRB) considers problem; approves, rejects or revises proposed solution; TTRB is supported by the site CM Administrator (CMA) (Steps 10 & 11)**
- **TTRB decides whether proposed change affects a configuration controlled item and therefore needs to be referred to the CCB(s) (Step 12)**

Problem Resolution (Cont.): Local Process



- For a configuration issue, site CMO distributes CCR for pre-CCB review (Step 13)
- Site CCB may approve, reject or revise change proposals (CCRs) (Step 14)
 - TTRB is notified of any rejected CCR and reconsiders the TT accordingly
- Site CCB decides whether system-wide or external elements are involved, necessitating referral to higher level CCB (Step 15)
- If proposed change does not affect a configuration controlled item, or if a site-approved CCR is not referred to higher level CCBs, solution may be implemented at site; TT status is changed to “Solution Implemented” (Step 16)

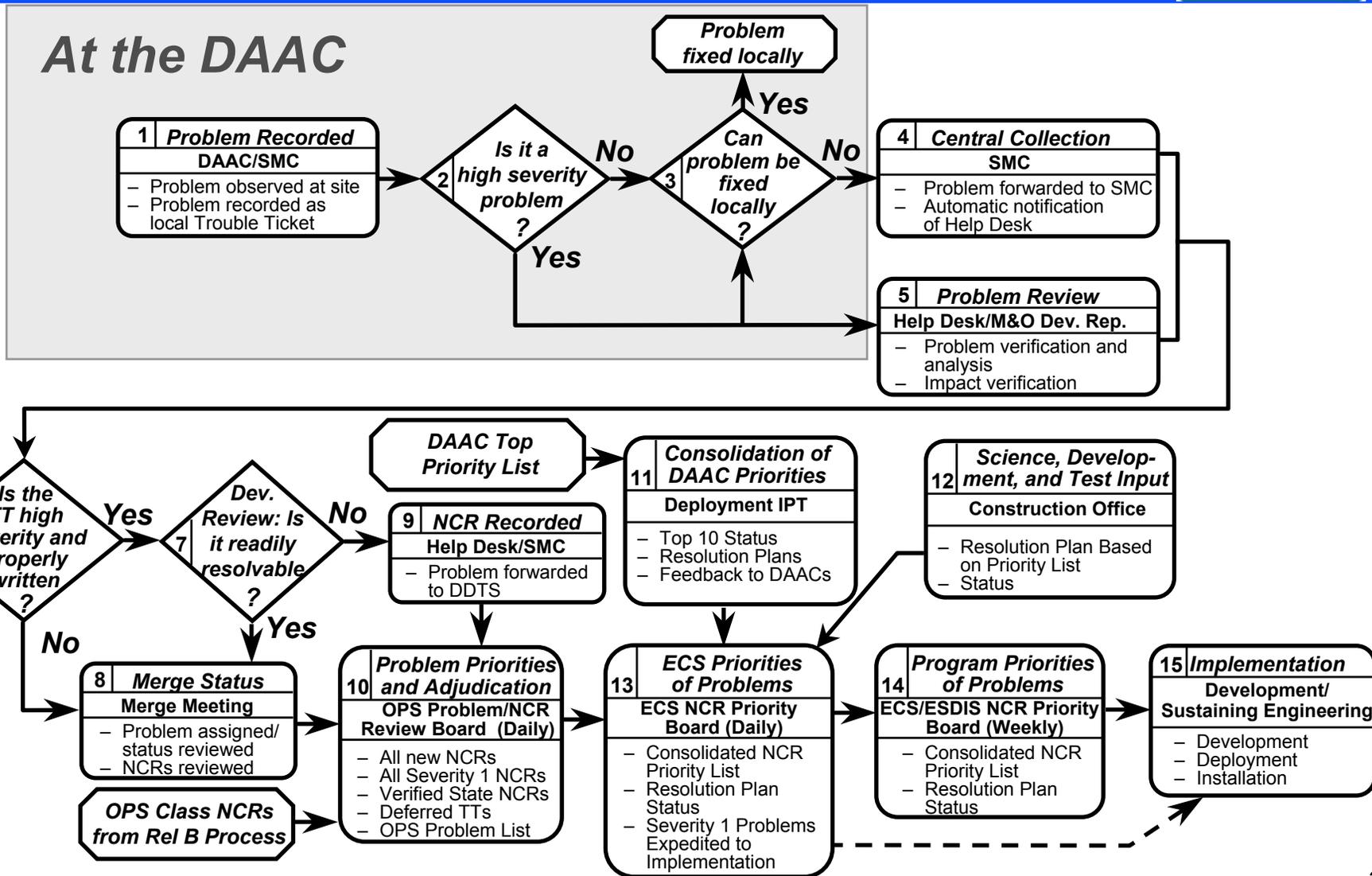
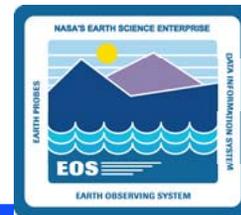
Problem Resolution (Cont.): Local Process



- **If external elements are involved and/or a CCR is escalated, off-site problem resolution process is initiated through the SOS Help Desk (Step 17)**
 - access: 1-800-ECS-DATA (1-800-327-3282)
 - may revise a proposed solution if there are system-level effects
- **Off-site resolution may include corrective action incorporated in a future release; correction is forwarded to site representative for testing/ acceptance; TT status is changed to “Solution Implemented” (Step 18)**
- **TTRB approves closure/further action assignment; TT status is changed to “Closed” and CMA files TT Master (Step 19)**

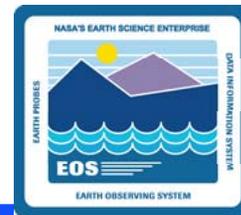
Problem Resolution (Cont.)

Process for TT/NCR Resolution at EDF



Problem Resolution (Cont.)

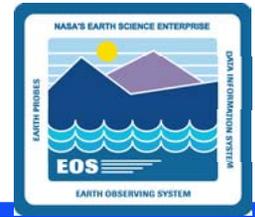
TT/NCR Process at EDF



- **Problem is initially recorded (as a Trouble Ticket) at the DAAC/SMC (Step 1)**
- **At the DAAC/SMC, the Operations Supervisor assesses whether the problem should be rated High Severity (Step 2)**
 - **If the problem is High Severity or an installation issue, it is called in to the SOS Help Desk**
- **The DAAC/SMC assesses whether the problem can be resolved locally (Step 3)**
 - **If the problem cannot be resolved locally, it is forwarded for central collection at the SMC and notification of SOS**
- **When any DAAC submits a Trouble Ticket to the SMC, the Help Desk at SOS is notified (Step 4)**

Problem Resolution (Cont.)

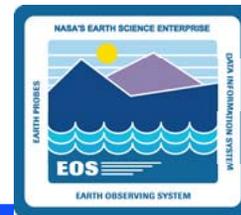
TT/NCR Process at EDF



- **The SOS Help Desk staff analyzes the problem and verifies the impact (Step 5)**
 - **Assures accuracy and completeness of TT information to ensure accurate assignment of severity**
 - **Frequency of problem occurrence**
 - **Time required for recovery or workaround**
 - **Number of people required for recovery or workaround**
 - **Lost productivity (Ingest/Production/Distribution)**
 - **Considers any available workaround and assigns the severity with any necessary modifications**
 - **A Development representative at M & O performs similar analysis and verification of problems already documented in problem records at EDF from the normal development problem discovery and problem management process**

Problem Resolution (Cont.)

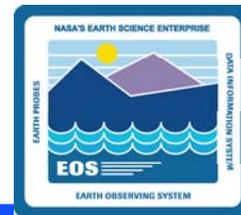
NCR Process at EDF



- **The Help Desk determines if the problem is high severity and written properly to document the severity rating (Step 6); if these conditions are met, the problem is referred immediately to developers to determine if the problem is readily resolvable (Step 7)**
- **If the problem is readily resolvable (and it is not yet past 4:00 pm), it is referred to the next day's Merge Meeting for assignment/status and review with existing problems/NCRs (Step 8)**
- **Problems that require longer effort or that are lower in severity are entered as NCRs in DDTs, with current impact, workarounds, and recommended severity (Step 9)**

Problem Resolution (Cont.)

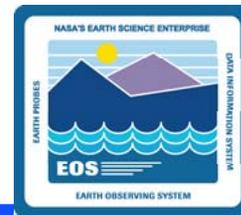
NCR Process at EDF



- **The OPS Problem/NCR Review Board (PRB) meets daily and reviews all new NCRs, Severity 1 NCRs, Verified state NCRs and deferred Trouble Tickets (Step 10)**
 - keeps metrics
 - distributes OPS Problem List to:
 - Sustaining Engineering (to set support resource priorities)
 - Deployment IPT (for status and feedback to DAACs)
 - ECS NCR Priority Board (for setting priorities)
 - DAACs (for information)
- **The Deployment Integrated Product Team (IPT) tracks DAAC problem priorities (e.g., DAAC Top 10 List) (Step 11)**
- **The Construction Office manages priorities for Science, Development, and Test in planning problem resolution (Step 12)**

Problem Resolution (Cont.)

NCR Process at EDF



- **The ECS NCR Priority Board meets daily to review problems and resolution status (Step 13)**
 - considers problems from the sites and from development
 - takes input from Deployment IPT and Construction Office
 - distributes a Consolidated NCR Priority List to ensure optimum focus of development, science, test, and DAAC resources, with due emphasis on Severity 1 problems
- **ECS and ESDIS meet weekly as the ECS/ESDIS NCR Priority Board to review problems in the context of program priorities (Step 14)**
- **Development and Sustaining Engineering resolve problems and implement solutions through development, deployment, and installation activities in accordance with approved priorities (Step 15)**

Problem Resolution (Cont.)



- **Trouble ticket and problem tracking scenario**
 - registered science end-user submits a **Trouble Ticket**
 - routine (non-emergency) problem
- **Problem scenario tracked through the local Trouble Ticket Review Board**

Problem Resolution (Cont.)

Problem Review Board



- **Problem Review Board (PRB) serves as the forum for discussion of ECS failures or non-conformances**
 - reviews all NCRs derived from Trouble Tickets submitted by the DAACs/SMC, along with those submitted for problems identified through Development/Test activities
 - sets problem priorities based on problem severity ratings and other factors (e.g., DAAC “Top Ten” or Priority lists, discussion consensus)
 - coordinates TT/NCR activities within M&O and with development, customer and user organizations
 - coordinates and distributes the OPS Problem/NCR List to:
 - ECS Sustaining Engineering (for setting support resource priorities)
 - Deployment IPT (for feedback to the DAACs)
 - ECS Prioritization Board (for setting program priorities)
 - DAACs (for information)

Problem Resolution (Cont.): PRB Telecon Attendees



- **Customer representatives**
- **ECS M&O Manager or designee (chairs Telecon)**
- **DAAC representatives**
- **SEO engineering team leads**
- **ECS ILS engineering support representatives**
- **ECS engineering team leads and operations representatives**
- **ECS M&O support staff**
- **ECS development organization representatives**

Problem Resolution (Cont.): PRB Telecon Agenda/Discussion



- **Review OPS Problem List and distribution of NCRs by organization, priority and age**
- **Review and set priority for each newly entered problem (NCR) from each site**
- **Assign NCR work-off responsibility to one organization**
- **Review and reset priorities for older NCRs (as required)**

PRB Telecon (Cont.)



- **Agenda items may be supplemented or replaced with hardcopy or softcopy reports**
- **Material from the meeting (including OPS Problem List) is distributed within each ECS organization and to customer and user organizations as required**

PRB Telecon (Cont.)



- **PRB Telecon obtains all necessary assistance to ensure thorough analysis of the problem**
 - may obtain assistance from system hardware suppliers
 - coordinates investigations and remedial actions with the appropriate project personnel from the National Aeronautics and Space Administration (NASA)
 - assures proper documentation of investigations and remedial actions
 - ensures that configuration changes (if any) are made in accordance with the configuration management procedures

PRB Telecon (Cont.)



- **Conditions to be verified before a malfunction report may be closed out:**
 - remedial and preventive actions (actions to prevent problem recurrence) completed on item
 - preventive design changes completed and verified
 - changes in operations, hardware, software, procedures have been verified during operations as satisfactory resolution to the problem
 - effective preventive actions established to prevent problems with other affected items
- **PRB Telecon must officially approve resolution of problem to close it out**

Making Emergency Fixes



- **Procedure varies**
 - nature of the problem
 - from ECS center to ECS center
- **Issues for providing a common framework for emergency responses to crisis-level situations:**
 - contingency plans
 - points of contact
 - general guidelines
- **General process not specific procedure**
 - model process: Hardware Emergency Change Scenario (604-CD-003-002)

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **Operator detects problem with ATL on Saturday evening; submits a TT**
- **System administrator confirms problem; notifies site maintenance engineer**
- **Maintenance engineer confirms problem**
- **Maintenance engineer reports problem to OEM**
- **OEM maintenance representative arrives, verifies symptoms, diagnoses faulty controller card; only spare available is of a later version**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **Maintenance engineer reports situation to operations supervisor**
- **Operations supervisor calls DAAC manager at home to report situation; DAAC manager approves board replacement with newer version contingent on acceptable testing results**
- **OEM maintenance representative installs replacement board**
- **Sustaining engineer tests new board; brings ATL back on line**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **Sustaining engineer generates CCR to document the configuration change**
- **Maintenance engineer records board replacement in ILM, referencing CCR**
- **Maintenance engineer closes TT**
- **Maintenance engineer updates ILM system property record with data on new board**
- **Sustaining engineer records installation in CCR; routes CCR to CM administrator**

Making Emergency Fixes (Cont.): Hardware Emergency Change



- **CM administrator decides whether to refer CCR to CCB (*NOTE: A change that would affect the ECS Operations Configuration Baseline must be forwarded to the M&O CCB for review and approval*)**
- **CM administrator updates Baseline Manager**
- **ECS SEO/SOS reviews CCR to determine effects on ECS system and other sites**
- **ESDIS CCB receives copy of CCR for review and concurrence**
- **CM administrator closes CCR when CCB has ratified the change**