

506-CD-510-001

## **EOSDIS Core System Project**

# **Configuration Audits of the Science Data Processing Segment, Release 5B for the ECS Project**

October 2000

Raytheon Company  
Upper Marlboro, Maryland

# Configuration Audits of the Science Data Processing Segment, Release 5B for the ECS Project

October 2000

Prepared Under Contract NAS5-60000  
CDRL Item #081

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# Preface

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# Abstract

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This report is a documented account of configuration audits conducted on the Science Data Processing Segment, Release 5B during the period from June 19, 2000 through September 27, 2000, and reported at Site Readiness Assessment (SRA).

The report includes:

- Planning process
- Conduct of configuration audits
- Results of the Physical Configuration Audits (PCA) and the Functional Configuration Audit (FCA)
- Lessons learned from these audits

**Keywords:** Acceptance Test, Certification, Configuration audits, FCA, Functional Configuration Audit, PCA, Physical Configuration Audit, SRA, Site Readiness Assessment, Status Accounting

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## **Abbreviations and Acronyms**



# 1. Introduction

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## 1.1 Identification

This Audit Report Document, Contract Data Requirements List (CDRL) Item 081, whose requirements are specified in Data Item Description (DID) 506/PA3, is a required deliverable under the Earth Observing System (EOS) Data and Information System (EOSDIS) Core System (ECS) Contract (NAS 5-60000).

## 1.2 Scope

This document describes the Audit Report results from the accomplishment of:

- Physical Configuration Audits (PCA) of the DAACs of the Science Data Processing Segment (SDPS), Release 5B, in preparation for SRA.
- Functional Configuration Audit (FCA) of the Science Data Processing Segment (SDPS), Release 5B.

Collectively these audits will be referred to as the Release 5B configuration audits.

The audit period was from June 19, 2000 through September 27, 2000 against the commercial off-the-shelf (COTS), operating system (OS) PCA, custom code, and configuration parameters, installed at the DAACs and SMC.

## 1.3 Objectives

Objectives of the configuration audits were as follows:

- Used to ensure that the approved release configuration conforms to the ECS Product Baseline for that site.
- Verify that the Science Data Processing Segment, Release 5B, as installed and formally tested, complies with the ECS Acceptance criteria contained in the ECS Product Baseline Tickets.
- Certify that software configurations audited were configured in accordance with the Product Baseline.

## 1.4 Purpose

This document provides the account of configuration audits conducted on the Science Data Processing Segment, Release 5B configuration during the reporting period.

## 1.5 Status and Schedule

This is a final report and is submitted in accordance with the requirement that it be released not later than 30 days after Site Readiness Assessment (SRA). The SRA schedule for the DAACs follows:

<b>DAAC</b>	<b>SRA Held</b>
EDC	8/18/00
GSFC	8/24/00
NSIDC	8/24/00
LaRC	9/7/00
SMC	9/27/00

## 1.6 Organization

This report is organized as follows:

Section 1 identifies the source requirement for this report, defines the scope, establishes the purpose, and provides the schedule for delivery.

Section 2 lists parent, applicable, and reference documents for this report.

Section 3 sets forth plans for the audits and the schedule as contained in the Audit Plan.

Section 4 describes how the audits were conducted; to include revised schedules followed. Appendices are provided to provide backup information.

Section 5 provides results of the audits.

Section 6 summarizes lessons learned from the audits.

## 2. Related Documentation

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### 2.1 Parent Document

423-41-01, Goddard Space Flight Center, ECS Core System Statement of Work

### 2.2 Applicable Documents

ECS Product Baseline technical documentation, to include:

#### 2.2.1 General Baseline

COTS	5A - COTS Software Version Baseline	910-TDA-003-Rev17
COTS	5B - COTS Software Version Baseline	910-TDA-003-Rev53

#### 2.2.2 O/S and COTS Patch Lists Baselines

OS	HP-UX Series 800 O/S Patches	911-TDA-002-Rev03
OS	SGI IRIX6.2 O/S Patches	911-TDA-004-Rev07
OS	SUN Solaris 2.5.1 O/S Patches	911-TDA-007-Rev06
OS	Clearcase COTS Patches	911-TDA-008-Rev01

#### 2.2.3 Site Specific Baselines

COTS	XRP HW/SW MAPS 5A Baseline	920-TDG-002Rev 19
COTS	XRP HW/SW MAPS 5B Baseline	920-TDN-002Rev 19
COTS	XRP HW/SW MAPS 5B Baseline	920-TDE-002Rev 20
COTS	XRP HW/SW MAPS 5B Baseline	920-TDL-002Rev 20
COTS	XRP HW/SW MAPS 5B Baseline	920-TDS-002Rev 21

#### 2.2.4 Configuration Parameters Baselines

SUN Platform UNIX Kernel Configuration Parameters	920-TDx-015Rev 00
SGI Platform UNIX Kernel Configuration Parameters	920-TDx-016Rev 01
HP Platform UNIX Kernel Configuration Parameters	920-TDx-017Rev 00

#### 2.2.5 Drop 5B Test Tickets

Tickets as they appear in the ECSVDB are available for download from the ECS Verification Website.

External URL: <http://ecsv.gsfc.nasa.gov/>

1Internal URL: [http://dmsserver.gsfc.nasa.gov/relb\\_it/relbit.htm](http://dmsserver.gsfc.nasa.gov/relb_it/relbit.htm)

### 2.2.6 Custom Code

Custom	Version 2 Release 5B.03 Version Description Document (VDD) for the ECS Project	814-RD-512-001
	Note: (5B_04 Transition Test Executable Installation Instructions)	

### 2.2.7 Test Documentation

All	ECS System Test Report for Release 5B	412-CD-110-001
FCA	Acceptance Test and System Verification Procedures	
FCA	Acceptance Test Results in Electronic Criteria Logs and Verification Data Base (VDB)	
FCA	NCR Status from DDTS, the NCR database	

## 2.3 Reference Documents

Design specification(s) (e.g., DID 305, Segment/Design Specifications)

Nonconformance reports

Results of release verification testing (e.g., tailored listings from test database)

## 2.4 Information Documents

MIL STD 973 Configuration Management, dated 17 April 1992

## 3. Audit Process

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Configuration audits for SDPS, Release 5B, were conducted during the period June 19, 2000 (initiation of COTS software PCA) through September 27, 2000. This process will be complete upon closure of all non-conformance reports (NCRs) and (CCRs) by CM, QA, M&O, and ESDIS team members.

Configuration audits were conducted in two distinct phases:

COTS Software, OS Patches, Custom Code and Configuration Parameters Physical Configuration Audits. These audits were conducted against EDC, GSFC, LaRC, NSIDC, SMC beginning on June 19, 2000 with the kickoff meeting at Landover.

Functional Configuration Audits. These were conducted on Release 5B at the Landover site. The FCA process began on February 17, 2000 with the kickoff meeting at Landover.

### 3.1 COTS Software, OS Patches, Custom Code and Configuration Parameters Physical Configuration Audits

#### 3.1.1 General

While the commercial off-the-shelf (COTS) software, operating system (OS) patch, custom code, and configuration parameters PCA were conducted concurrently, the respective audit concept, team objectives, technical data package, milestones, and membership varied between audits to a considerable degree.

#### 3.1.2 Concept

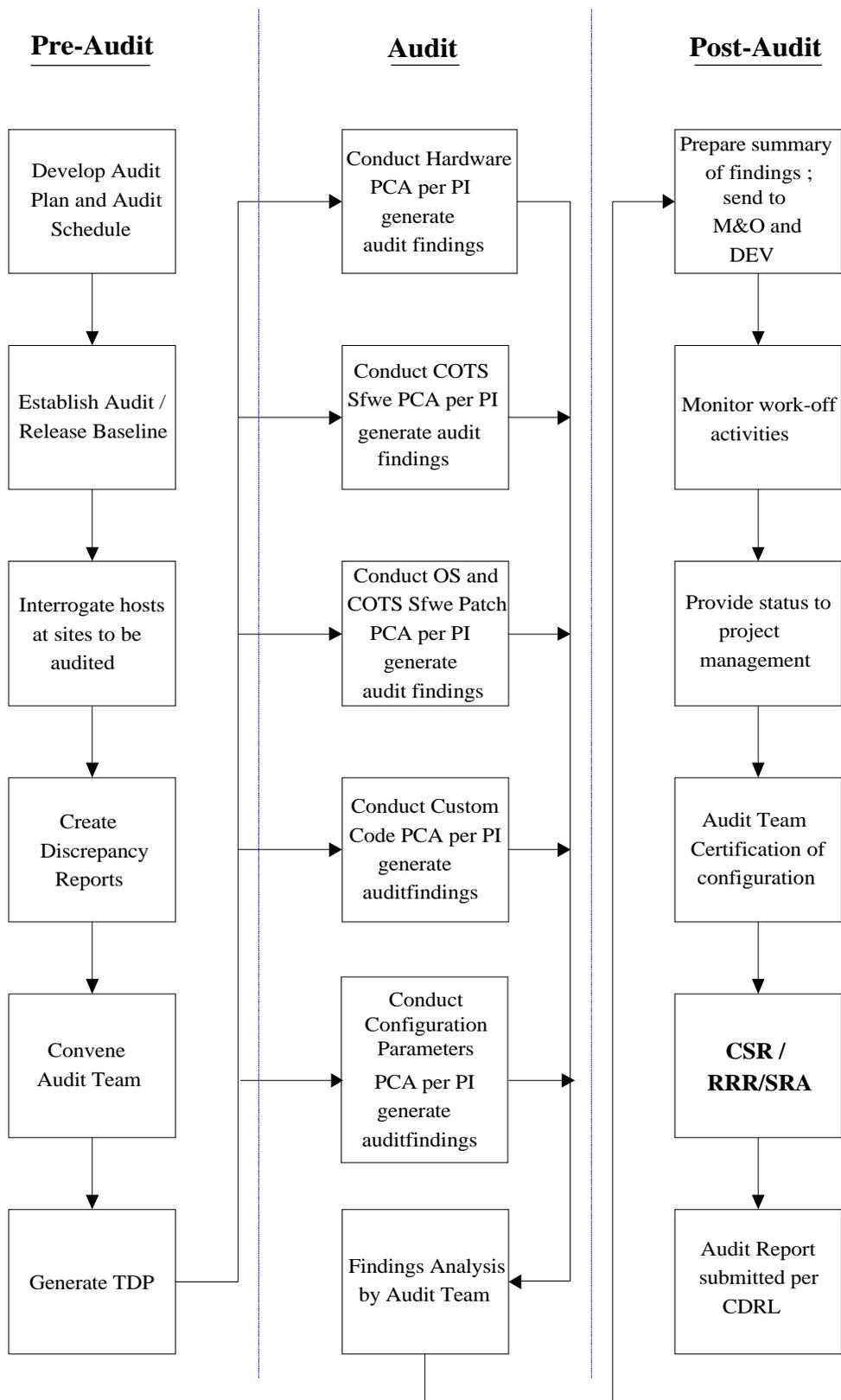
The concept called for dividing the software PCA into four parts (COTS software and shareware, OS patches, custom code, and configuration parameters), identified the needed audit team composition, and announced that CMO would lead the PCA, supported by QA, while QA would manage the FCA, supported by CMO. Audit teams were formed, procedures were developed, and appropriate baseline documents were identified and reviewed by the audit team.

Four “sets” of audits were required for each of the sites to which Release 5B was to be installed.

Below was the schedule of the audits conducted:

<b>Site</b>	<b>COTS</b>	<b>OS Patches</b>	<b>Custom</b>	<b>Configuration Parameters</b>
EDC	7/5/00	7/5/00	7/5/00	7/5/00
GSFC	6/19/00	6/19/00	8/17/00	8/17/00
LaRC	8/31/00	8/31/00	8/31/00	8/31/00
NSIDC	8/17/00	8/17/00	8/17/00	8/17/00
SMC	8/31/00	8/31/00	8/31/00	8/31/00

These audits were conducted at Landover utilizing Unix command scripts querying each system in baseline. These interrogation scripts had been developed by CMO over a period of three years. The process is shown schematically in Figure 3-1.



**Figure 3-1. Software PCA Process Flowchart**

### 3.1.3 Team Objectives

During each audit PCA team members were responsible to assure that the configuration audited was in accordance with Product Baseline and that all documentation of audit findings had been incorporated into the appropriate NCR or CCR.

## 3.2 COTS Software Configuration Audits

### 3.2.1 Activity

Once formed, the audit team assembled baseline documentation followed the process for conducting their audit (based on the Configuration Audit PI), to interrogate hosts on a non-interference basis, generated difference reports and discrepancy analysis reports.

COTS Software Audit Binder(s) comprised of:

- XRP Baseline Information
  - Site Hardware-Software Maps (920-TDx-002) used during interrogation
  - COTS Software Version Baseline Report (910-TDA-003) used during interrogation
- Current version of COTS Discrepancy reports for the site
  - Synopsis of COTS Discrepancy report
  - Complete output of Diff Scripts
- Audit finding COTS/OS software worksheet
- Existing NCR listing from appropriate DDTS database

### 3.2.2 Technical Data Package

See Section 2.2 Applicable documents identified as “COTS”.

### 3.2.3 Milestones

Activity	EDC DAAC	GSFC DAAC	NSIDC DAAC	LaRC DAAC	SMC DAAC
Interrogation	6/25/00	6/15/00	8/15/00	8/25/00	8/25/00
Audit Team Activity	7/5-10/00	6/19-23/00	8/17-21/00	8/31/00	8/31/00
SRA Presentation	8/18/00	8/24/00	8/24/00	9/7/00	9/27/00

### 3.2.4 Team Members

Membership included representatives from CMO, M&O, DEV, QA, site representatives, and ESDIS QA.

### 3.3 OS Patch Physical Configuration Audits

#### 3.3.1 Activity

Once formed, the audit team assembled baseline documentation followed the process for conducting their audit (based on the Configuration Audit PI), to interrogate hosts on a non-interference basis, generated difference reports and discrepancy analysis reports.

OS and COTS Patch Audit Binder(s) comprised of:

- XRP Baseline Information
  - HP-UX, Series 800 Patch List (911-TDA-002)
  - SGI IRIX Patch List (911-TDA-004)
  - Sun Solaris Patch List (911-TDA-007)
  - ClearCase Patch List (911-TDA-008)
- OS Patch (HP, SGI, and Sun platforms) Discrepancy reports (*Note:* ClearCase Patch discrepancies are located within the COTS Discrepancy reports)
  - Synopsis of COTS Discrepancy report
  - Complete output of Diff Scripts
- Audit finding COTS/OS software worksheet for OS patches (HP, SGI, and Sun platforms) and ClearCase patches
- Existing NCR listing from appropriate DDTS database

#### 3.3.2 Technical Data Package

See Section 2.2, Applicable Documents identified as “OS”.

#### 3.3.3 Milestones

Activity	EDC DAAC	GSFC DAAC	NSIDC DAAC	LaRC DAAC	SMC DAAC
Interrogation	6/25/00	6/15/00	8/15/00	8/25/00	8/25/00
Audit Team Activity	7/5-10/00	6/19-23/00	8/17-21/00	8/31/00	8/31/00
SRA Presentation	8/18/00	8/24/00	8/24/00	9/7/00	9/27/00

#### 3.3.4 Team Members

Membership included representatives from CMO, M&O, DEV, QA, site representatives, and ESDIS QA.

## 3.4 Custom Code Configuration Audits

### 3.4.1 Activity

The auditor interrogates hosts and results were stored on pete. These "as-builts" were compared to the Custom Code Reference, and difference reports were generated.

### 3.4.2 Technical Data Package

See Section 2.2, Applicable Documents identified as "Custom Code".

### 3.4.3 Milestones

Activity	EDC DAAC	GSFC DAAC	NSIDC DAAC	LaRC DAAC	SMC DAAC
Interrogation	6/25/00	6/15/00	8/15/00	8/25/00	8/25/00
Audit Team Activity	7/5-10/00	6/19-23/00	8/17-21/00	8/31/00	8/31/00
SRA Presentation	8/18/00	8/24/00	8/24/00	9/7/00	9/27/00

### 3.4.4 Team Members

Membership included representatives from CMO, M&O, DEV, QA, site representatives, and ESDIS QA.

## 3.5 Configuration Parameters Audits

### 3.5.1 Activity

The auditor assembled baseline documentation, followed the process for conducting their audit to manually interrogate hosts on a non-interference basis, and generated difference reports.

### 3.5.2 Technical Data Package

See Section 2.2, Applicable Documents identified as "Configuration Parameters".

### 3.5.3 Milestones

Activity	EDC DAAC	GSFC DAAC	NSIDC DAAC	LaRC DAAC	SMC DAAC
Interrogation	6/25/00	6/15/00	8/15/00	8/25/00	8/25/00
Audit Team Activity	7/5-10/00	6/19-23/00	8/17-21/00	8/31/00	8/31/00
SRA Presentation	8/18/00	8/24/00	8/24/00	9/7/00	9/27/00

### 3.5.4 Team Members

Membership included representatives from CMO, M&O, DEV, QA, site representatives, and ESDIS QA.

## 3.6 Functional Configuration Audits

### 3.6.1 Objectives

FCA sought to confirm that the ECS verification status is correct, traceable, and substantiated by original test records and artifacts.

Criteria is properly mapped from test procedures to baseline Tickets and ultimately to the VDB.

NCRs created during test execution are properly accounted for in DDTS (the NCR database).

Test completion status as recorded on the Test Execution form is correct and substantiated by test records and artifacts.

### 3.6.2 Scope

CSR related activities performed:

- 29 Drop 5B test folders from VATC formal testing were audited.
- No Performance Tests, End-to-End (ETE) tests or ECS Verification Reports (EVRs) were audited.
- The VDB was reconciled with test records and criteria verification status.

### 3.6.3 Process

ECS Quality Assurance engineers reviewed test folders, original artifacts, reports; and recorded findings. These were traced from original VATC test records through interim reports to the VDB.

### 3.6.4 Activity

Specific activity included assuring that test cases were mapped to Tickets, auditing test results to confirm Criteria verification status, reviewing open NCRs to confirm status, and verifying that NCR bookkeeping was current and complete.

### 3.6.5 Technical Data Package

Available on SVAT and VDB web sites.

### 3.6.6 Milestones

Initiation of Activity	2/17/00
Audit Team Activity	2/17/00 - 10/3/00
CSR Presentation	5/11/00

### **3.6.7 Team Members**

During conduct of the audits team members changed based upon availability. Membership included engineers from ECS Quality Assurance.

### **3.7 Audit Procedures**

Conducted in accordance with PI CM-1-009, Physical Configuration Audits and PI CM-1-036, Functional Configuration Audits.

### **3.8 Presentation of Results**

Results presented in CSR and SRA Review.

#### **3.8.1 Consent to Ship Review**

On May 11, 2000 ECS provided a final summary review of the Science System Release 5B status.

This report utilizes information used to support the final Release 5B CSR.

#### **3.8.2 Site Readiness Review**

On August 18, 2000 through September 27, 2000 ECS provided their final summaries of the Science System Release 5B status.

These reports utilize information used to support each final Release of 5B SRAs.

## 4. Conduct of Audits

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### 4.1 COTS Software Configuration Audits

#### 4.1.1 Technical Data Package

COTS Software Audit Technical Data Package (TDP) were developed by team leaders and assigned to individual teams. Binders contained the XRP Baseline data (Hardware-Software Map, COTS Software Version Baseline Report, COTS Discrepancy Reports, and Discrepancy Analysis Report) necessary to conduct the audit.

#### 4.1.2 Procedures

Conducted audits by interrogating each host to generate audit-finding results. Once complete, line-by-line inspection of the discrepancy report was performed to produce the discrepancy analysis.

#### 4.1.3 Findings

Findings were recorded as follows:

- Approved but not installed
- Not approved but installed
- Installed w/incorrect version/path

### 4.2 OS Patch Physical Configuration Audit

OS Patch Discrepancy reports were organized into HP, SGI, and Sun Platforms. (ClearCase and DCE patches were assessed concurrently with OS patches. Procedures were similar.

#### 4.2.1 Technical Data Package

OS Patch TDP were developed by team leaders and assigned to individual teams. Binders contained the Baseline data for the applicable host.

#### 4.2.2 Procedures

Sub-teams performed a preliminary check of their binder to ensure all necessary documents were present. Once complete, a line-by-line inspection of the discrepancy report is performed.

### **4.2.3 Findings**

Findings were recorded as follows:

- Approved but not installed
- Not approved but installed

## **4.3 Custom Code Configuration Audits**

### **4.3.1 Technical Data Package**

Custom Code TDP were developed by team leaders and assigned to individual teams. Binders contained the Baseline data for the applicable host.

### **4.3.2 Procedures**

The Custom Code reference generation was performed using scripts. Beginning with the Release Tape's files, including the .sitemap file, package files, and installable unit files, the scripts derived which executables should be found on each of the hosts. This information was then replicated on to the pete.hitc.com server for each DAAC and host.

The hosts were interrogated for Custom Code, and the results were stored on pete. These "as-builts" were then compared to the Custom Code Reference, and Discrepancy Reports were generated and analyzed.

### **4.3.3 Findings**

Findings were recorded as follows:

- Approved but not installed
- Not approved but installed
- Installed w/incorrect version/path

## **4.4 Configuration Parameters Audits**

### **4.4.1 Technical Data Package**

The Configuration Parameter references were initialized by reading the hosts' parameter values. These read values, after analysis, were used as Rev00 for the 920-TDx-015, -016, and -017.

### **4.4.2 Procedures**

The audit of the Configuration Parameters was performed manually, comparing the baseline reports to the interrogation reports (same format). Findings were noted.

The hosts were interrogated for the parameters, and the "as-built" parameters were then compared to the baseline. For the Sun and HP hosts, there were no baseline or host changes since initialization. There were baseline changes for the SGIs (Rev01), and most of the hosts' "as-built" agreed with those changes.

#### **4.4.3 Findings**

Findings were recorded as follows:

- Correct Values
- Incorrect Values

### **4.5 Functional Configuration Audits**

#### **4.5.1 Test Folders**

FCA checklists were completed by auditors and placed in 5B test folders. Folders contained the complete test results and all applicable baseline documents.

#### **4.5.2 Procedures**

Teams performed a preliminary check of the folders to assure that all required information was present. Once complete they proceeded with a line-by-line inspection of the folder contents and completion of the checklist.

#### **4.5.3 Findings**

There were no deficiencies or observations identified about criteria verification status. Deficiencies were recorded as non-compliance with test record procedures and these were tracked in the QA deficiency database until corrected and closed.

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## 5. Audit Results

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### 5.1 COTS Software Configuration Audits

#### 5.1.1 Findings

The following specific findings were recorded.

Finding	EDC	GSFC	LaRC	NSIDC	SMC
Properly Installed	51.7%	59.9%	54.8%	61.6%	73.2%
Baseline not found	11.6%	25.0%	16.1%	8.7%	5.7%
Incorrectly installed	10.0%	5.2%	19.0%	20.7%	8.2%
Not Baseline, Installed	26.7%	9.9%	10.1%	9.0%	13.0%

#### 5.1.2 Findings Summary

To determine which findings were the most critical ECS Development reviewed preliminary results and stated that 39 COTS products were required for the release to operate properly. Findings against these products were considered to be medium severity; the remaining findings were considered low severity.

The Critical COTS products required for the system to operate correctly were:

Critical COTS Software		
ACSLs	FLEXIm	RAID Driver
AMASS	HDF Libraries	Replication Server
AutoSys	HiPPI SW	Replication Server Manager
AutoSys Remote Agent	HP OpenView	Remedy ARS
AutoSys Xpert	HP-UX	Spatial Query Server (SQS)
BDS	IMSL C Libraries	SQL Server Monitor Client/Svr
BuilderXcessory 5.0	IMSL FORTRAN Libraries	Spatial Query Server (SQS)
CDE	IRIX 6.2	Solaris 2.5.1
DBTools.h++	jre	Solaris 2.6
DCE Client	Net.h++	StorEdge Volume Manager
DCE Server	Netscape Enterprise Server	Sybase Adaptive Server
DiskSuite	Open Client/C	TCP Wrappers
Exabyte Driver	PERL	Tools.h++

## 5.2 OS Patches Physical Configuration Audits.

### 5.2.1 Findings (Sun/HP/SGI)

The following specific findings were recorded.

Finding	NSIDC		
	SUN	HP*	SGI
Properly Installed	91.4%	67.3%	63.3%
Baseline not found	5.9	17.4	29.0%
Not Baseline, Installed	2.7%	15.3%	7.7%

Finding	GSFC		
	SUN	HP*	SGI
Properly Installed	97.6%	79.6%	65.6%
Baseline not found	1.6%	10.5%	29.2%
Not Baseline, Installed	0.8%	9.9%	5.2%

Finding	EDC		
	SUN	HP*	SGI
Properly Installed	90.1%	78.2%	70.4%
Baseline not found	5.9%	11.1%	24.6%
Not Baseline, Installed	4.0%	10.7%	5.0%

Finding	LaRC		
	SUN	HP*	SGI
Properly Installed	95.39%	73.50%	98.30%
Baseline not found	4.16%	23.47%	0.35%
Not Baseline, Installed	0.45%	3.03%	1.35%

Finding	SMC		
	SUN	HP*	SGI
Properly Installed	96.9%	78.5%	N/A
Baseline not found	1.9%	18.4%	N/A
Not Baseline, Installed	1.2%	3.1%	N/A

### 5.2.2 Findings Summary

ECS Development reviewed preliminary results and discrepancies to these products were considered to be low severity.

## 5.3 Custom Code Configuration Audits

### 5.3.1 Findings

The following specific findings were recorded.

Finding	EDC	GSFC	LaRC	NSIDC	SMC
BNF*	4(4)	8(222)	12(100)	3(115)	4(4)
NBI	0	0	9	0	0
WVC	6	6	8	7	0
Total Executables	575	589	539	507	66

\* Note: For the missing files (BNFs), the first # is for the primary hosts, and the second # in parenthesis is for the backup host.

### 5.3.2 Findings Summary

ECS Development reviewed preliminary results and discrepancies to these products were considered to be low severity.

Findings were documented in 5 NCRs. These NCRs were all severity 3.

EDC	GSFC	LaRC	NSIDC	SMC
1	1*	1*	1	1

\**Note:* The preliminary findings were analyzed and submitted to the respective DAACs. All findings have been resolved pending verification by CM.

## 5.4 Configuration Parameters Audits

### 5.4.1 Findings

The following specific findings were recorded.

Finding	EDC	GSFC	LaRC	NSIDC	SMC
Wrong Values	0	6	0	0	0

## 5.4.2 Findings Summary

ECS Development reviewed preliminary results and discrepancies to these products were considered to be low severity.

Findings were documented in 1 NCRs. This NCR was severity 3.

EDC	GSFC	LaRC	NSIDC	SMC
0	1	0	0	0

*\*Note:* The preliminary findings were analyzed and submitted to the respective DAACs. All findings have been resolved pending verification by CM.

## 5.5 Workoff Plan

After dissemination of findings, site personnel worked in conjunction with audit team representatives to group as many findings as were possible. Below you will find the workoff plans proposed at SRA, and comments as to their status.

### 5.5.1 EDC

#### COTS SW:

- 87 findings will result in updates to baseline documentation and will be completed by 10/30/00.
- 176 findings will be reviewed by CM and M&O with the DAACs to prioritize and complete outstanding items.

#### OS Patches:

- 116 Items must be assigned to System Administrator for priority resolution. ( 24 - Sun's, 27 - SGI's, 65 - HP's)

#### Custom Code and Configuration Parameters:

- None

### 5.5.2 GSFC

#### COTS SW:

- 44 findings will result in updates to baseline documentation and will be completed by 10/30/00.
- 127 findings will be reviewed by CM and M&O with the DAACs to prioritize and complete outstanding items.

#### OS Patches:

- 75 Items must be assigned to System Administrator for priority resolution. ( 7 - Sun's, 26 - SGI's, 42 - HP's)

#### Custom Code and Configuration Parameters:

- 14 Old Custom Code versions can be removed from g0css02 (OPS).
- Review g0drg06 and g0drg07 semaphore settings

### 5.5.3 LaRC

#### COTS SW:

- 23 findings will result in updates to baseline documentation and will be completed by 10/30/00.
- 114 findings will be reviewed by CM and M&O with the DAACs to prioritize and complete outstanding items.

#### OS Patches:

- 37 Items must be assigned to System Administrator for priority resolution. ( 16 - Sun's, 7 - SGI's, 14 - HP's)

#### Custom Code:

- Write an NCR to document the findings.

### 5.5.4 NSIDC

#### COTS SW:

- 43 findings will result in updates to baseline documentation and will be completed by 10/30/00.
- 87 findings will be reviewed by CM and M&O with the DAACs to prioritize and complete outstanding items.

#### OS Patches:

- 97 Items must be assigned to System Administrator for priority resolution. ( 16 - Sun's, 24 - SGI's, 57 - HP's)

#### Custom Code:

- Write NCR to document the 3 findings.

### 5.5.4 SMC

#### COTS SW:

- 17 findings will result in updates to baseline documentation and will be completed by 10/30/00.

#### OS Patches:

- 17 Items must be assigned to System Administrator for priority resolution. (0 - Sun's, 17 - HP's)

## **5.6 Functional Configuration Audit Results**

### **5.6.1 Verification Status of FC and EC for CSR**

100% of FCs and ECs were confirmed as correct in VDB. These were drawn from the 29 acceptance test folders that had been audited.

### **5.6.2 FCA Conclusions**

FCA objectives were achieved.

During Drop 5B Acceptance Testing the quality of test records continued to improve. The VDB contains accurate criteria verification status.

Ongoing activity

## 6. Lessons Learned

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### 6.1 Areas for Improvement

- Lack of a standard feedback loop from the DAACs when the need arises to deviate from the install instructions.
- Problems that have been identified in previous audits have not been resolved.
- Need to improve Baseline management process, updates are not captured accurately in the XRP database.
- PCA's are not conducted on a routine basis to resolve discrepancies as they occur.
- CMO needs to improve it's direct process with RTSC to address OS Patch findings.

### 6.2 Process Improvement Actions

- Implement a standard policy for the DAAC's to use the TT reporting process to communicate deviations from the install instructions. Status - completed
- Action team (CM and M&O) to work with DAACs (as appropriate) to review and resolve outstanding PCA NCR's. Status - in progress
- Review existing processes within baseline management. Recent change in CMO separates the audit and baseline management team. Status - in progress
- Audits will be conducted on a weekly basis to identify new discrepancies from the baseline and will be addressed immediately. Status - in progress

### 6.3 FCA Team Member Comments

#### 6.3.1 Test Folders

Perform test folder audits incrementally rather than all at the end of formal testing.

#### 6.3.2 Overall Process

The following comments were made regarding process improvements:

- Feedback findings to test as you go rather than at the end. Give them the opportunity to improve their processes as needed and fix the problems.
- Be flexible and able to react to process changes along the way
- Accept help whenever offered but train them well
- Keep your customer fully informed and involved

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# Abbreviations and Acronyms

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CCB	Change Control Board
CCR	Configuration Change Request
CDRL	Contract Data Requirements List
CI	Configuration Item
CM	Configuration Management
CMO	Configuration Management Office
COTS	Commercial Off-The-Shelf
CSCI	Computer Software Configuration Item
CSR	Consent to Ship Review
DAAC	Distributed Active Archive Center
DDTS	Distributed Defect Tracking System
DID	Data Item Description
DMO	Data Management Organization
ECS	EOSDIS Core System
EDF	ECS Development Facility
EOSDIS	Earth Observing System Data and Information System
FCA	Functional Configuration Audit
GSFC	Goddard Space Flight Center
HP	Hewlett Packard
HWCI	Hardware Configuration Item
M&O	Maintenance and Operations
MIL STD	Military Standard
NASA	National Aeronautics and Space Administration
NCR	Non-Conformance Report
NLT	Not Later Than
OS	Operating System
PCA	Physical Configuration Audit

PI	Project Instruction
QO	Quality Office
RAID	Redundant Array of Inexpensive Disks
RRR	Release Readiness Review
SDPS	Science Data Processing Segment (ECS)
SGI	Silicon Graphics, Inc.
SOW	Statement of Work
SRA	Site Readiness Assessment
VCATS	Vendor Cost And Tracking System
VDD	Version Description Document
WBS	Work Breakdown Structure