

456-TP-017-001

# Final Report of Physical Configuration Audits of Pre-Release B Testbed Hardware

Technical Paper

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# Preface

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# Abstract

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This report is an account of configuration audits conducted on the Pre-Release B Testbed for Science Software Integration and Test (SSI&T) for AM-1 and SAGE III instrument science software. Audits were conducted during the period from April 17 to June 30, 1997 at Goddard Space Flight Center (GSFC), Langley Research Center (LaRC), EROS Data Center (EDC) and National Snow and Ice Data Center (NSIDC) Distributed Active Archive Centers (DAAC). Primary source of inventory data was commercial off-the-shelf (COTS) hardware information obtained from the Vendor Cost and Tracking System (VCATS) database.

The audits confirmed that the as delivered hardware was compliant with the Implementation Plan for Pre-Release B Testbed for the ECS Project, 416-WP-001-001 and Configuration Change Requests (CCR) approved by the Pre-Release B CCB that update the hardware configuration.

The report includes:

- Introduction to include description, purpose, scope; criteria and schedule for audits;
- Documentation related to the audits;
- Process followed in conducting the audits;
- Results of the Physical Configuration Audits (PCAs) of the Pre-Release B hardware; and
- Lessons learned from these audits.

**Keywords:** Audit, Certification, Configuration audits, DAAC, Physical Configuration Audit, PCA, Pre-Release B, Product Baseline, PBL, Testbed, and VCATS

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## Abbreviations and Acronyms

# 1. Introduction

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## 1.1 Description

This report describes the physical configuration audits (PCA) conducted on Pre-Release B Testbed hardware after deployment to the four designated Distributed Active Archive Centers (DAAC): Goddard Space Flight Center (GSFC), Langley Research Center (LaRC), EROS Data Center (EDC) and National Snow and Ice Data Center (NSIDC) Distributed Active Archive Centers (DAAC). This report also includes lessons learned during the conduct of these audits.

## 1.2 Purpose

The purpose of each audit was to confirm that the “as delivered” hardware was compliant with the Implementation Plan for Pre-Release B Testbed for the ECS Project, 416-WP-001-001 and approved CCRs made by the Pre-Release B CCB. COTS software and custom software were not inventoried.

## 1.3 Scope

This report describes the development of audit data for each audit, conduct of preliminary audits, the process used to correct discrepancies found, final audits, and turnover to resident ECS Maintenance and Operations (M&O) personnel for sustaining engineering.

## 1.4 Organization

This report is organized as follows:

*Section 1* describes the audits, provides their purpose, defines the scope of activities, and includes an outline of the organization of this report.

*Section 2* list parent, applicable, and guidance documents for this report.

*Section 3* describes the phases followed by each audit, the criteria used for auditing, and provides a schedule of audit activities.

*Section 4* summarizes results of the audits.

*Section 5* provides lessons learned from the audits.

*Appendix A* provides copies of certificates signed by resident M&O personnel at each site accepting turnover.

*Appendix B* contains detailed audit results.

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## 2. Related Documentation

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### 2.1 Parent Document

The following documents are the parents from which this document's scope and content are derived.

420-02-02 (Rev A) Goddard Space Flight Center, Earth Observing System (EOS) Configuration Management Plan

420-05-03 Goddard Space Flight Center, Earth Observing System (EOS) Performance Assurance Requirements for the EOSDIS Core System (ECS)

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

423-41-02 Goddard Space Flight Center, Functional and Performance Requirements Specification for the Earth Observing System Data Information System (EOSDIS) Core System (ECS)

423-41-03 Goddard Space Flight Center, EOSDIS Core System (ECS) Contract Data Requirements Document

ESDIS Project CCR Nr. 505-01-41-135

### 2.2. Applicable Documents

The following documents are referenced herein and are directly applicable to this document. In the event of conflict between any of these documents and this document, this document shall take precedence.

101-CD-001-004 Project Management Plan for the EOSDIS Core System, Revision 1, DCN No. 01

102-CD-001-004 Development Configuration Plan for the ECS Project

104-CD-001-004 Data Management Plan for the ECS Project, Revision 1

102-CD-002-001 Maintenance and Operations Configuration Management Plan for the ECS Project

194-201-SE1-001 Systems Engineering Plan for the ECS Project

194-602-OP1-001 Property Management Plan for the ECS Project

416-WP-001-001, Implementation Plan for Pre-Release B Testbed for the ECS Project

456-WP-001-001, Plan for Physical Configuration Audits of Pre-Release B Testbeds

## **2.3 Information Documents**

The following documents, although not directly applicable, amplify or clarify the information presented in this document, but are not binding on the content herein.

MIL-STD-498 Department of Defense, Military Standard for Software Development and Documentation

MIL-STD-973 Department of Defense, Military Standard for Configuration Management

## 3. Audit Process

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### 3.1 Phases

Audits were conducted in accordance with 456-WP-001-001, Plan for Physical Configuration Audits of Pre-Release B Testbeds. They were conducted in phases for each site audited. These phases are summarized below.

#### 3.1.1 Hardware Installation

Prior to each site demonstration M&O Integrated Logistics Support (M&O-ILS) office personnel installed COTS hardware in accordance with the Testbed design configuration that had been baselined by the Pre-Release B Testbed CCB. This configuration was used for demonstrations at each site.

#### 3.1.2 Development of audit data

Primary source of inventory data was COTS hardware information obtained from the Vendor Cost and Tracking System (VCATS) database. This information was supplemented by hardware diagrams, installed network diagrams, cable management plans, and floorplans. This “package” of documentation was prepared for each site and used as the basis for the audits.

#### 3.1.3 Review of Data

Using installation data M&O-ILS compiled listings of COTS hardware from their VCATS database. In addition site-specific installed network diagrams (provided by the Systems Engineering Office), cable management plans (from M&O-ILS), and floorplans (from M&O-ILS) were developed to completely define the hardware for audit and subsequent turnover. This information was turned over to SMO for review prior to preliminary audits at each site. Project CM status accountants assembled this data and reviewed it to assure conformity to Pre-Release B Testbed CCB configuration at each site.

Since the audits were conducted sequentially, the review of data was spread out over a two month period of time. In general it followed the process of CMO personnel acquiring information from M&O-ILS and System Engineering, evaluating it and reconciling any apparent discrepancies before conducting preliminary PCAs of Testbeds at each deployed site.

#### 3.1.4 Preliminary Audits

Audits were intended to follow the “sell off” demonstration and fielding of the Testbed at that site. In fact there were time delays between the demonstration and the preliminary audit of from 5 to 19 days. These were caused by the non-availability of required documentation after demonstrations or scheduling problems encountered at site or by the audit team arriving at site.

At each site the audit process began with walkthroughs of the physical layout of equipment. Following this, the floor plan, VCATS listings, hardware diagram, network diagram and cable management plan were compared to the hardware configuration. During each preliminary audit discrepancies, which were not correctable on site, were recorded and compiled.

The majority of discrepancies were errors in recorded serial numbers, nomenclature on diagrams and room numbers on the floor plans. When required, the audit team verified RAM and hard disk space via real-time console interrogation and physically checked hardware configurations.

### **3.1.5 Correction of Preliminary Audit Discrepancies**

Upon completion of the preliminary inspection the audit team documented any discrepancies found on site and held a meeting at which representatives from Pre-Release B engineering, System Engineering office (*if required*), and M&O Integrated Logistics Support Office (M&O-ILS) were present. At this meeting discrepancies were reviewed, corrective actions determined, and responsibilities assigned. Key to this process was a determination as to whether the functionality of the Testbed (as described in 416-WP-001-001, Implementation Plan for Pre-Release B Testbed for the ECS Project, Sections 2 and 3) was properly implemented.

### **3.1.6 Final Audits**

As soon as CMO was reasonably confident that all discrepancies had been corrected, audit team members returned to the site for the final audit and turnover of the configured Testbed to site personnel. At this time all nonconformances to the established physical configuration were recorded as NCR, entered into the NCR tracking system, and provided to M&O.

Although it had been expected that all discrepancies noted during the preliminary audit would be corrected, some discrepancies, identical to ones found at the preliminary audit, were uncovered. During final audits every attempt was made to minimize writing NCRs by on-site corrective action.

Upon audit completion, a meeting was held to inform the DAAC M&O personnel of the discrepancies. At this meeting resident M&O personnel were asked whether any unresolved discrepancies remained with the configuration, and to certify whether the testbed hardware was acceptable for turnover. If found acceptable<sup>1</sup>, the Testbed was turned over to resident M&O personnel for sustaining engineering.

The final briefing concluded with the sign over of the Testbed installation to the DAAC M&O organization. At all DAACs final acceptance was dependent upon closure of all recorded discrepancies. See Appendix A for completed audit certificates.

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<sup>1</sup> Certificates of acceptance are found at Appendix A.

## 3.2 Criteria

The following criteria were followed throughout the audit process:

- M&O was “customer” for turnover.
- Government observed all audits.
- Audits followed engineering demonstration of Testbed functionality to site personnel and were conducted on “non-interference basis” with demonstration.
- Development personnel prior to and during inventory were not required.
- Inventories were conducted by project Configuration Management status accounting personnel assisted by M&O.
- PCAs were considered complete at each site when the COTS hardware baseline described in the Pre-Release B Testbed Plan for the ECS Project conforms to the COTS hardware listings obtained from the VCATS database.
- COTS software and custom software were not included in the audits.<sup>2</sup>

## 3.3 Schedule

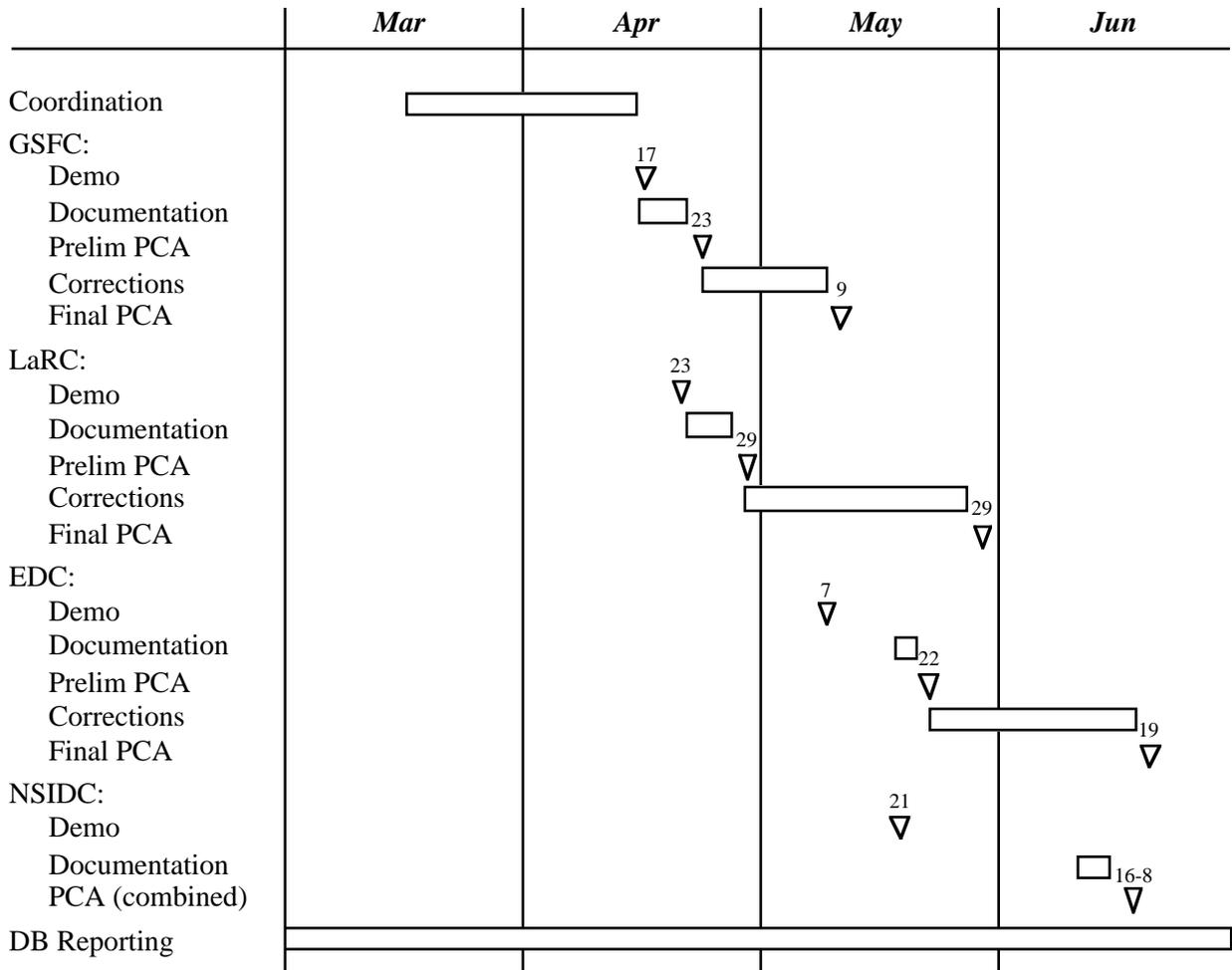
The audit plan had envisioned closer integration with the Testbed demonstrations, as well as the availability of comprehensive audit documentation before the start of the audits. This did not occur. Demonstrations were conducted from 6- 26 days in advance of audits; and the assemblage of audit documentation required considerable coordination.

### 3.2.1 Schedule of Audits

Shown below is the actual schedule for the audits. Note that the process described was modified for the last audit (at NSIDC) so that only one visit was made to that site.

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<sup>2</sup> After publication of the audit plan ECS agreed to prepare a Version Description Document (VDD) of the Testbed software. While informal checks of this VDD were made at two audits, EDC and NSIDC, the results from this are not included within this report.



**Figure 3-1. Actual Schedule for Pre-Release B Physical Configuration Audits.**

### 3.2.2 Observations

The process, as set forth in the audit plan, failed to account for the time and effort required to assemble and integrate technical documentation. This proved to be a lengthier process than had been foreseen. In addition, resident personnel at the DAAC at times had other activities scheduled which delayed audit visits. As long as these delays did not affect the ability of the audit team to complete the audits by June 30<sup>th</sup>, the team agreed to accommodate site scheduling requirements.

It should be pointed out that cooperation of DAAC personnel at all sites was excellent. They were very helpful with setting up network guest accounts, providing work space, providing time on the system, removing machine covers, etc. Without their cooperation the audits could not have been completed.

## 4. Results

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### 4.1 Conduct of Audits

Audits began on April 17, 1997 and continued through June 27, 1997.

Turnover to M&O for operations occurred upon resolution of the last NCR at each site. As of this date all NCRs written during these audits have been closed. Turnover to M&O is complete.

The conduct of audits is summarized in the table shown below:

<b>Event</b>	<b>GSFC</b>	<b>LaRC</b>	<b>EDC</b>	<b>NSIDC</b>
Testbed Demonstration	4/17/97	4/24/97	5/19/97	6/9/97
Review of data	4/17-21/97	4/24-28/97	5/19-21/97	6/9-13/97
Preliminary Inspections	4/22/97	4/29/97	5/22/97	N/A
Discrepancy Correction	4/23-5/8/97	4/30-5/19/97	5/23-6/12/97	N/A
Final Audits	5/9/97	5/24/97	6/19-20/97	6/16-18/97
NCRs (See App. B)	12	9	9 + 1 <sup>3</sup>	14
NCR Closure Period	5/12-16/97	5/24-6/26/97	6/23/-6/27/97	6/18-27/97
NCR Remaining Open	0	0	0	0
Certification	5/9/97 (App. A-1)	5/24/97 (App. A-2)	6/20/97 (App. A-3)	6/16/97 (App. A-4)
Turnover	Completed	Completed	Completed	Completed

### 4.2 Distribution of Discrepancies

Discrepancies found during audits were considered minor. Amount of NCR written at each site are shown in the table below. Also shown is a summary of deficiencies for each document audited.

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<sup>3</sup> A 10<sup>th</sup> NCR was added on June 23<sup>rd</sup> during the NCR presentation to documentation owners.

Complete listing of discrepancies found during audits and recorded on NCRs may be found at Appendix B.

<b>Document</b>	<b>GSFC</b>	<b>LaRC</b>	<b>EDC</b>	<b>NSIDC</b>
<u>Cable Mgt Plan</u> <i>- Incorrect cable information</i>	1	1	1	1
<u>Floorplan</u> <i>- Incorrect names; wrong room numbers</i>	1	1	1	1
<u>Hardware Diagram</u> <i>- Incomplete/incorrect configuration</i>	1	1	2	1
<u>Network Diagram</u> <i>- Room numbers, incomplete connection(s); name changes</i>				1
<u>VCATS Listings</u> <i>- Serial numbers (or EIN), missing components (or peripherals), and incorrect configuration</i>	8	6	6	10
<u>Other</u> <i>- Deletion of requirement to open hardware to verify network interface cards, power supplies, and controller cards</i>	1			
<b>Total NCRs</b>	12	9	10	14

## 5. Lessons Learned

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### 5.1 Documentation

With the exception of the hardware diagram (provided by the Pre-Release B CCB) none of the documents used for this audit had been baselined. As a result CMO status accountant had to review this documentation in detail prior to conducting the preliminary audits. The time spent in this activity was needed.

#### 5.1.1 Cable Management Plan

Cable Management Plan allowed auditors the ability to check that all cables were properly labeled and that site connectivity was in accordance with the design.

#### 5.1.2 VCATS Listings

The VCATS reports are not “inventory friendly”. Without ready access to vendor part number descriptions, it was often virtually impossible to know what is being represented by a line item on these reports.

#### 5.1.3 Network Diagrams

The only documents from the baseline set, which were (with one minor exception) complete and error free, were the network diagrams and address definitions.

#### 5.1.4 Hardware Diagram(s)

Hardware Configuration Diagrams, really a representation of the COTS design, were considered as critical documents; particularly so when considering the shortcomings of the VCATS reports. These diagrams could have had greater value if better descriptions were given of peripheral devices, RAIDS and storage arrays, in particular.

#### 5.1.5 Floorplan

The floor plan was high order “map” of a site. However, considering that floor space utilization will be going through constant tuning as the DAACs are expanding the local site plans should have been used. These were more complete and current than the M&O-ILS-generated floor plans.

## 5.2 Pre-PCA Activities

The Pre-PCA check of inconsistencies among the audit documentation identified many problems. However, these would have been fewer in number if documents submitted for audit had been baselined.<sup>4</sup>

It would have been helpful if, time permitting, auditors had had time to go to either the Engineering Design Facility or the GSFC DAAC to familiarize themselves with configurations they would be auditing.

### 5.2.1 Interface with ECS Organizations

There was little interface with Pre-Release B personnel prior to or during the demonstrations. Once the audits began pre-Release B personnel joined all meetings reviewing discrepancies from preliminary audits and corrected their design document when required.

It was never apparent that anyone in ECS M&O fully understood the audits or their intended outcome.

### 5.2.2 Coordination with Sites

Interface with M&O and Engineering was often informal, but seemed to work well. Site coordination was handled adequately by telephone.

M&O people and DAACs people were somewhat "out of the loop". We found that all sites (except GSFC) had not received the PCA audit plan.

Site involvement is essential: in planning, auditing, and follow-up.

## 5.3 Preliminary PCA

The need for a preliminary PCA is based on the fidelity of the documents to be audited. If they are baselined and are being maintained, a preliminary audit is definitely not required.

When both preliminary and final audits are conducted the process is very time consuming. Its value is justified only if we make sure that all discrepancies are detected and fixed before the formal PCA. Therefore, during the final inspection we should find few discrepancies.

As a rule sites benefited from pre-audits performed in advance of this formal audit. Most of the discrepancies identified in the pre-audit were corrected before the final audit.

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<sup>4</sup> Only the hardware diagram was baselined.

### **5.3.1 Recording of Discrepancies**

The use of a separate floor plans, VCATS reports, hardware diagram, network diagram, IP address assignment tables and cable management plans was cumbersome, as each had to be updated separately. Host, component, and peripheral records should be maintained in a database, not a series of discrete drawings.

Discrepancies found during the preliminary PCA should be recorded onto hard-copy forms and discussed at the site before the audit team returned to Landover. The format for this could be informal (notebook format) or formal (input into DDTS), depending on the scope of the audit and the timing of the return visit.

If the notebook format is used fields recommended are: Discrepancy #, Description, Date, Assignee, Date due, Action, Remarks, Status, and Date.

### **5.3.2 Correction of Discrepancies**

Actions taken to correct discrepancies should be reviewed by personnel at Landover and at the DAAC. The audit team should assure that all corrections have been made before returning to a DAAC for the final PCA.

Since discrepancies were not reviewed at site, there was considerable difficulty experienced in translating written descriptions and recommended corrective action and reconciling these with actions that had to be accomplished to “close” the discrepancy.

Final inspections should not be initiated without some “call forward” from sites that discrepancies had been corrected.

## **5.4 Formal PCA**

### **5.4.1 Work done since Preliminary**

The usefulness of the preliminary audit was demonstrated at the GSFC, LaRC and EDC DAACs<sup>5</sup>, where the audit team was well prepared for these DAACs and many minor errors were corrected before the final audits.

When preceded by a preliminary audit, DAAC personnel were more comfortable with the process and anticipated the type of support the audit team required.

### **5.4.2 Conduct**

If only one inspection is to be performed, auditors need to spend considerable time assuring the fidelity of the technical data package, comparing documents (to eliminate errors between them), and answering questions from site personnel.

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<sup>5</sup> The preliminary and final audits were combined at NSIDC.

### **5.4.3 Certification**

Since this was not a formal delivery, the meaning of certification became somewhat meaningless, especially since the turnover to operations had already occurred.

### **5.4.4 Records**

Complete records of each DAAC audit should be compiled by CM and kept as a record of all activities and actions performed during the audit.

## **5.5 Software**

Even though software was not an official audit task, the EDC VDD was used to spot check the software configuration at both DAACs. This demonstrated that the software documentation did not describe what software (COTS and custom) was required for each hardware platform; where the software resided on each platform (full path for both COTS and Custom code); what version of the software was correct for each file. This information was provided to FOS and Release B.

## **5.6 Handover**

Turnover should be a significant event. It should imply that the “customer” has received everything he requires and that they (i.e., the customer) is ready to proceed to the next phase of operations. This was not the case with the pre-Release B Testbed, where the customer (i.e., M&O site representative) was more of a temporary custodian.

Future turnovers should be to Government representative / DAAC manager.

## Appendix A. Certificates

<h3><u>Certificate</u></h3>	
<p>The Physical Configuration Audit of the Pre-Release B Testbed (456-WP-001-001) for the ECS Project was conducted on <u>May 9, 1997</u> at <u>GSFC</u>.</p>	
<p>The audit examined the "as built" testbed to assure that the hardware delivered with the testbed conformed to the ECS design baseline.</p>	
<p>As a result of the audit I certify that testbed hardware:</p>	
<p><input type="checkbox"/> Conforms to the testbed baseline and is acceptable for turnover.</p>	
<p><input checked="" type="checkbox"/> Conforms to the testbed baseline upon resolution of the following specified problems: <u>NCR 1 through 12 as attached</u> and will be acceptable to turnover upon resolution of the above.</p>	
<p><input type="checkbox"/> Does not conform to the testbed baseline.</p>	
<p><u>Eames J. Heath</u> (Name)</p>	<p><u>HITS M&amp;O 5/9/97</u> (Organization) (Date)</p>

Figure A-1. GSFC Certificate

# Certificate

The Physical Configuration Audit of the Pre-Release B Testbed (456-WP-001-001) for the ECS Project was conducted on May 29, 1997 at LaRC.

The audit examined the "as built" testbed to assure that the hardware delivered with the testbed conformed to the ECS design baseline.

As a result of the audit I certify that testbed hardware:

- Conforms to the testbed baseline and is acceptable for turnover.
- Conforms to the testbed baseline upon resolution of the following specified problems:  
NCRs 1 through 9 as attached  
and will be acceptable to turnover upon resolution of the above.
- Does not conform to the testbed baseline.

Lucia S. Lee M+O 5-29-97  
(Name) (Organization) (Date)

**Figure A-2. LaRC Certificate**

# Certificate

The Physical Configuration Audit of the Pre-Release B Testbed (456-WP-001-001) for the ECS Project was conducted on June 20, 1997 at EDC.

The audit examined the "as built" testbed to assure that the hardware delivered with the testbed conformed to the ECS design baseline.

As a result of the audit I certify that testbed hardware:

- Conforms to the testbed baseline and is acceptable for turnover.
- Conforms to the testbed baseline upon resolution of the following specified problems:  
NCRs 1 through 9 as attached  
and will be acceptable to turnover upon resolution of the above.
- Does not conform to the testbed baseline.

John C. Paucoray HITS-M&O 6/20/97  
(Name) (Organization) (Date)

**Figure A-3. EDC Certificate**

# Certificate

The Physical Configuration Audit of the Pre-Release B Testbed (456-WP-001-001) for the ECS Project was conducted on June 17, 1997 at NSIC.

The audit examined the "as built" testbed to assure that the hardware delivered with the testbed conformed to the ECS design baseline.

As a result of the audit I certify that testbed hardware:

- Conforms to the testbed baseline and is acceptable for turnover.
- Conforms to the testbed baseline upon resolution of the following specified problems:  
NCRs 1 through 14 as attached  
and will be acceptable to turnover upon resolution of the above.
- Does not conform to the testbed baseline.

Louise J. Hunt NSIC/HUGHES 6/17/97  
(Name) (Organization) (Date)

Figure A-4. NSIC Certificate

## Appendix B. Detailed Results

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### B.1 GSFC.

#### Cable Management Plan:

**NCR #** 6605  
**Defect:** Room number "To Area" should be changed from C101 to C101P  
**Action:** Changed room number  
**Status:** Closed (5/15/97)

#### VCATS Report:

**NCR#** 6607  
**Defect:** Serial numbers for EIN 1452 and EIN 1368 are swapped. Internal configuration for EIN 1452 and EIN 1368 needs to be verified against VCATS Reports.  
**Action:** Swapped Serial numbers in VCATS database  
**Status:** Closed (5/15/97)

**NCR#** 6608  
**Defect:** Serial number for (child) 4317 should be changed from: 9550G13173 to: 9550GI3173  
**Action:** Changed Serial number in database  
**Status:** Closed (5/15/97)

**NCR#** 6609  
**Defect:** Monitor, S/N 01C15802381 is not reflected on VCATS Report.  
Note: This monitor may appear as child to EIN 1180. EIN 1180 is not part of Testbed configuration  
**Action:** Added monitor to parent  
**Status:** Closed (5/15/97)

**NCR#** 6610  
**Defect:** External Hard Drive (HD) - EIN 4347, S/N 612G9614 does not appear on VCATS report  
**Action:** Added HD to database  
**Status:** Closed (5/15/97)

**NCR#** 6611  
**Defect:** External HD - EIN 4345, S/N 612G9537 does not appear on VCATS Report  
**Action:** Added HD to database  
**Status:** Closed (5/15/97)

**NCR#** 6612  
**Defect:** Hard Drives - 14 installed in RAID; VCATS Report reflects 11.  
**Action:** Added additional RAID units to VCATS database  
**Status:** Closed (5/15/97)

**NCR#** 6613  
**Defect:** External HD, EIN 4344, S?N 611G6045 is not reflected in VCATS Report.  
**Action:** Added HD to database  
**Status:** Closed (5/15/97)

**NCR#** 6614  
**Defect:** Add EIN 0667 to: S/N SNMA0000031622  
Add EIN 0722 to: S/N SNMA0000340956  
Tape Drives - Incorrect serial number. VCATS report reflects S/N 6620419.  
Unit S/N 11003365  
**Action:** Corrected database  
**Status:** Closed (5/15/97)

#### Hardware Diagram:

**NCR#** 6621  
**Defect:** AITHW-GSFC-2; change memory from 128MB to 224MB.  
PLNHW-GSFC-2; remove "+2GB disk". Memory is already included in "6GB"  
MSS-GSFC-1.1; remove "+4GB disk". Memory is already included in "8GB".  
MSS-GSFC-1.2; change memory from 50GB to 84GB.  
**Action:** Updated documentation  
**Status:** Closed (5/15/97)

#### Floor Plan:

**NCR#** 6623  
**Defect:** Change drawing from: AIT-G-1 TO: TB-AIT-1  
Units MSS-3 and DMG-4 should be swapped  
**Action:** Changed designations on plan  
**Status:** Closed (5/15/97)

#### PCA White Paper (456-WP-001-001):

**NCR#** 6624  
**Defect:** Plan required verification of network interface cards, number of power supplies, and controller cards  
**Action:** Errata sheet was prepared removing this level of detail from audit requirements  
**Status:** Closed (5/15/97)

#### Turnover

Attendees at the Physical Configuration Audit (PCA) of Pre-Release B Hardware turnover meeting at Goddard Space Flight Center (GSFC) on 9 May 1997 were:

Joe Spyrison	Quality Office
Dave C. Morgan	System Management Office / Configuration Management
Jerry Klein	ESDIS Quality Assurance
Jim Lane	System Management Office / Configuration Management
Paul Fingerman	System Management Office
Tom Hickey	Maintenance & Operation Office
Felicia Harris	System Management Office / Configuration Management
Tom Suhrstedt	HTSC
Earnest (Matt) Matthews	HITS
Giuseppe Calavaro	System Management Office

## B.2 LaRC.

### Cable Management Plan:

**NCR #** 7041  
**Defect:** Cable LA048 is not connected to ACM-L-4 (Repeat finding - 008)  
Cable LA071 does not exist at AIT-L-2 and no labeled cable goes to LA0205 (Repeat finding - 011)  
Cable LA073 does not exist at SPR-L-4 and no labeled cable goes to HUB 1-19 (Repeat finding - 012)  
Cables LA079 and LA080 are not connected to CSS-L-1  
Cables LA081 and LA082 are not connected to MSS-L-4  
Cable LA097 is not connected to MSS-L-3 (Repeat finding - 015)  
Cables LA083 and LA084 are not on the plan:  
LA083 is connected to CSS-L-1 and Concentrator 9 port 6  
LA084 is connected to MSS-L-4 and Concentrator 9 port 4  
**Action:** LA048 is now connected to TB-ACM-L-4; dated 6/17/97.  
LA071 now exists at TB-AIT-L-2 and it is now connected to LA0205; dated 6/17/97.  
LA073 now exists at TB-SPR-L-4 and it is now connected to HUB 1-19; dated 6/17/97.  
LA079 & LA080 are now connected to TB-CSS-L-1; dated 6/17/97.  
LA081 & LA082 are now connected to TB-MSS-L-4; dated 6/17/97.  
LA097 is now connected to TB-MSS-L-3; dated 6/17/97.  
Cables LA083 and LA084 should not be on the plan because they are not connected to M&O hardware; dated 6/17/97.  
**Status:** All Actions Closed, 6/26/97

### VCATS Report:

**NCR #** 7034  
**Defect:** EIN# 0691: Keyboard serial number 91241761 should be 20440541 (Keyboard not connected)  
**Action:** Keyboard serial number changed; dated 6/25/97.  
**Status:** Closed, 6/26/97

**NCR#** 7035  
**Defect:** EIN# 1204: Monitor serial number (child) 1206 should be changed from: 01C15002395 to: 01C15802395  
**Action:** Monitor serial number changed; dated 6/25/97..  
**Status:** Closed, 6/26/97

**NCR#:** 7036  
**Defect:** EIN# 1292: Sun workstation serial number should be changed from: 543F0953 to: 543F095E  
**Action:** SUN workstation serial number changed; dated 6/25/97.  
**Status:** Closed, 6/26/97

**NCR#:** 7037  
**Defect:** EIN# 1370: Keyboard serial number should be change from: MX54222791 to MX54601383  
Monitor serial number should be changed from: JP01178923 to JP01171151  
**Action:** Keyboard and monitor serial numbers changed; dated 6/25/97.  
**Status:** Closed, 6/26/97

**NCR#:** 7038  
**Defect:** EIN# 1455: Keyboard serial number should be changed from: MX54601383 to MX54222791

Monitor (EIN-1456) serial number should be changed from: JP01171151 to JP01178923  
**Action:** Keyboard and monitor serial numbers changed; dated 6/25/97.  
**Status:** Closed, 6/26/97

**NCR#:** 7040  
**Defect:** EIN# 4392: Monitor serial number (child 4391) should be changed from 410209-79 to: 410209-73  
**Action:** Monitor serial number changed; dated 6/25/97.  
**Status:** Closed, 6/26/97

### Hardware Diagram:

**NCR#:** 7032  
**Defect:** Doc.#: 420-TD-003-003, dated 5/15/97:  
 SPRHW-LARC-5; change disk from 4 GB to 14 GB  
 SPRHW-LARC-6; change disk from 4 GB to 14 GB  
 PLNHW-LARC-1; change disk from 6 GB to 2 GB  
 AITHW-LARC-2; change EIN# from 4343 to 4353  
 ACMHW-LARC-4; change disk from 4 GB to 6 GB  
 MSS-LARC-1.1; remove blank box and the additional comma with EIN#0783  
 SPRHW-LARC-9 and SPRHW-LARC-10; the word "Monitor" needs to be spelled out  
**Action:** Completed and updated Hardware Diagram as described to Doc #: 420-TD-003-004; dated 6/23/97  
**Status:** Closed, 6/26/97

### Floor Plan:

**NCR #** 7033  
**Defect:** Change unit name from B.0-MSS-L3 to TB-MSS-L3 (Repeat finding -010)  
 Change unit name from TB-MSS-22 to TM-MSS-2.2  
 Change unit name from TB-SUPP-L5 to TB-ACM-L5 (Repeat finding -007)  
 Change unit name from TB-ACM-L3 to TB-ACM-4 (Repeat finding -009)  
 Change unit name from TB-MSS-L1 to TB-MSS-L1.1  
**Action:** Changed designations on plan; dated 6/16/97.  
 TB-SPR-L1A,B; Unit to be moved to EDC (Repeat finding -005)  
 Removed from Floor Plan; dated 6/16/97.  
 Note: Stay at Langley facility. Drives were moved from SPR-L1 to SPR-L6.  
 Change unit name from B.0-SPR-L5A to TB-SPR-L5A  
 Changed designation on plan; dated 6/16/97.  
 RAID box missing from diagram. Unit name needs to appear on diagram (EIN1663)  
 RAID added to Floor Plan; dated 6/16/97.  
 Terminal missing from diagram. They are TB-SPR-L5 and TB-SPR-L6 (Repeat finding -006)  
 Wyse terminals added to Floor Plan; dated 6/16/97.  
**Status:** Closed, 6/26/97

### Turnover

Attendees at the Physical Configuration Audit (PCA) of Pre-Release B Hardware turnover meeting at Langley Research Center (LaRC) on May 24, 1997 were as follows:

Giuseppe Calavaro	System Management Office / System Engineering
Felicia Harris	System Management Office / Configuration Management
Jerry Klein	ESDIA QA
Lucy Lee	HITS
Joe Spyrison	Quality Office

## B.3 EDC.

### Cable Management Plan:

**NCR #** 7308  
**Defect:** Connectivity Name: Change from T-ACM-E-3 to T-ACM-E-1 T .  
Connectivity Name: Change from T-AIT-E-3 to T-AIT-E-2.  
**Action:** Updated Cable Management Plan, dated 06/25/97.  
**Status:** Closed 6/27/97

### VCATS Report:

**NCR#** 7310  
**Defect:** EIN 0657; serial number entry for item Keyboard is missing. Recorded as 9510156649.  
**Action:** Added serial number to VCATS report EIN 657, dated 06/25/97.  
**Status:** Closed 6/27/97

**NCR#** 7314  
**Defect:** EIN 4568; HOST NAME entry is incorrect as TB-CSS-E-1. Change to MSS-E-2.  
**Action:** Changed HOST NAME entry in VCATS report EIN 4568, dated 06/25/97.  
**Status:** Closed 6/27/97

**NCR#** 7315  
**Defect:** EIN 4570; HOST NAME entry is incorrect as TB-MSS-E-2. Change to CSS-E-1.  
**Action:** Changed HOST NAME entry in VCATS report EIN 4570, dated 06/25/97.  
**Status:** Closed 6/27/97

**NCR#** 7316  
**Defect:** EIN 1428: External Hard Drive (HD) - EIN 4350, S/N 612G9541 is incorrectly listed as EIN 3434,S/N 548G0953 on VCATS report.  
**Action:** Change HD EIN and S/N in VCATS report EIN 1428, dated 06/26/97.  
**Status:** Closed 6/27/97

**NCR#** 7318  
**Defect:** EIN 1442:  
SPARCStation serial number is incorrectly listed as Q549F02FC. Change to 549F02FC.  
EIN 1450, Storage Array serial number is incorrectly listed as 54616D4. Change to 546F16D4.  
Keyboard serial number is incorrectly listed as 9523237816. Change to 9526237816.  
Disk Drives, P/N X765A for Storage Array are listed as 10 items. Unit status panel indicates 14 mounted disks.  
**Action:** Items 1 - 3 were typographical errors made during data entry and have been corrected. Item 4 was determined to be a data entry error, after the P.O #CMM0002207 revealed that four of the fourteen disks were shipped as factory installed items and they were not itemized, nor their serial numbers captured, during receiving. Items 1 through 4 have been corrected in VCATS report EIN 00001442, dated 06/26/97.  
**Status:** Closed 6/27/97

**NCR#** 7319  
**Defect:** EIN 1207; Part numbers P8-S-4D (4.3GB HD) and 013-1186-003 (2GB HD Internal) occur twice in this report, with different serial numbers, however only one of each was accounted for during the audit.  
**Action:** Upon investigation, it was determined that the EIN 1207 VCATS report had not been properly updated to reflect maintenance action which resulted in the replacement of both of these disk drives. The new/replacement disk drives were added to the report along with their correct serial numbers, however, the failed/removed drives had not been removed from the VCATS report. Review by M&O-ILS determined that the EIN 1207 VCATS report was not properly updated after maintenance action had replaced both of the disk drives. Failed/removed drives had not been removed from the VCATS report.  
**Status:** The VCATS report has been corrected and verified. The correct serial numbers now appear in the VCATS database. NCR# 7319 is closed

### Hardware Diagram:

**NCR#** 7307  
**Defect:** PLNHW-EDC-1; change internal disk space from 6GB to 3GB.  
**Action:** Updated Hardware Diagram 420-TD-050-003, dated 06/26/97.  
**Status:** Closed 6/27/97

**NCR#** 7325  
**Defect:** EIN 4310; This report includes two 25.3GB SPARC storage MultiPack disk arrays, which were verified during the physical audit, however the design document (420-TD-050-001 / HW Diagram) indicates a requirement for two 40GB (usable space) arrays, indicating a shortage of external disk storage space.  
**Action:** The physical audit and further investigation by ILS in Landover indicates that the Hardware Diagram is erroneous as there is no shortage of disk, and the diagram should instead reflect two 25GB disk arrays for EIN 00004310. Updated Hardware Diagram 420-TD-050-003, dated 06/26/97.  
**Status:** Closed 6/27/97

### Floor Plan:

**NCR#** 7304  
**Defect:** Change drawing from: T-ACM-3A to T-ACM-1A.  
Change drawing from: MSS-1A to T-MSS-1A.  
Change location of printer, item T-AIT-2 to opposite end of table.  
**Action:** Changed designations on plan.  
**Status:** Closed 6/27/97

### Turnover

Attendees at the Physical Configuration Audit (PCA) of Pre-Release B Hardware turnover meeting at EROS Data Center (EDC) on 18 and 19 June 1997 were:

Joe Spyrison  
Dave C. Morgan  
Jerry Klein  
Felicia Harris  
Giuseppe Calavaro  
John Daucsavage  
Wayne Hanson

## B.4 NSIDC.

### Cable Management Plan:

**NCR#:** **7265**  
**Defect:** Cable NB001; change FDDI & PORT location; from: C1/P10 to: C2/P11  
Cable NB021; change FDDI & PORT location; from: C3/P12 to: C1/P12  
Cable NB020; change room number; from: RM 256 to: RM 252  
Cable NB081; change room number; from: RM 252C to: RM 252  
Cable NB003; is connected one-way; from: Comm Rack only  
Cable NB015; is connected one-way; from: Comm Rack only  
**Action:** All corrections to port numbers and room changes were made.  
In addition, The lack of the connection of cables to TB-PLN-N-1 and TB-SPR-N-2 stems from the lack of Dual Attached FDDI boards. The FDDI board for TB-PLN-N-1 was shipped to NSIDC on 6/26/97.  
The requirement for dual attachment was eliminated for TB-SPR-N-2 because upon discussion with SGI, it was found that SGI Challenge S machines do not support a dual attached FDDI board. The decision was made by the development team to allow TB-SPR-N-2 to remain attached to the network as it was installed i.e. with a single attached FDDI board; Dated 6/26/97.  
Randy Bollinger has updated HW/Network Diagram accordingly; Doc#: 420-TD-049-004; dated 6/26/97.  
**Status:** Closed, 6/27/97

### VCATS Report:

**NCR#:** **7267**  
**Defect:** EIN# 1263 SUN Workstation; change serial number; from: 541F0956 to: 543F0956 Room Location; change room number; from: 252D to: 252  
**Action:** VCATS report changed with correct serial and room number, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** **7268**  
**Defect:** EIN# 3203 Keyboard; change serial number; from: 1Z070965 to: 12070965 Memory; VCATS shows 192MB whereas Interrogation shows 128MB  
**Action:** VCATS report changed with correct serial number and amount of RAM, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** **7269**  
**Defect:** EIN# 3192 VCATS shows 15 x 4.3 GB HD for RAID whereas 20 x 4.3 GB HD were counted.  
**Action:** VCATS report changed to correct number of RAID Drives, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** **7270**  
**Defect:** EIN# 1273 SUN Workstation; change serial number; from: 541F039C to: 541F03C9 Monitor; change serial number; from: 9537133944 to: 9537FC0934  
**Action:** VCATS report changed to correct serial numbers, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** **7271**  
**Defect:** EIN# 1269 SUN Workstation; change serial number; from: 541F094E to: 543F094E  
**Action:** VCATS report changed to correct serial number, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** 7272  
**Defect:** EIN# 1448 VCATS shows 384MB whereas Interrogation shows 256MB  
Note: Site name is in lowercase; "nsidc" verses "NSIDC"  
**Action:** VCATS report changed to correct amount of RAM, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** 7273  
**Defect:** EIN# 4567  
VCATS shows 384MB whereas Interrogation shows 256MB  
VCATS shows 4GB HD whereas Interrogation shows 6GB HD Note: GB HD  
needs an internal audit for final verification.  
**Action:** VCATS report changed to correct amount of RAM and GB, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** 7274  
**Defect:** EIN# 4572 VCATS shows 384MB whereas Interrogation shows 256MB  
VCATS shows 4GB HD whereas Interrogation shows 1.5 GB HD Note: GB  
HD needs an internal audit for final verification  
**Action:** 6/25/97 Randy Bollinger, M&O/SEO Lead Engineer The MSS-NSIDC-1  
diagram actually has 2GB of storage rather than the 1.5GB described in the  
defect above. The 2GB amount is the actual physical device amount, the 1.5GB  
found during the interrogation was the usable (i.e available) amount.  
VCATS report changed to correct amount of RAM and GB, dated 6/24/97.  
**Status:** Closed, 6/27/97

**NCR#:** 7275  
**Defect:** EIN# 4858 Room number; change from: 252C to: 252  
**Action:** VCATS report changed with correct room number, dated 6/24/97  
**Status:** Closed, 6/27/97

**NCR#:** 7276  
**Defect:** EIN# 1262 Room number; change from: 256 to: 252  
**Action:** VCATS report changed with correct room number, dated 6/24/97  
**Status:** Closed, 6/27/97

### Network Diagram:

**NCR#:** 7264  
**Defect:** Doc#: 420-TD-049-003; Dated 6/11/97 PLNHW-NISDC-2; change FDDI  
Cable; from: C1 to: C2 AITHW-NISDC-1; change FDDI Cable; from: C3 to:  
C1  
Additional comments: 6/26/97: Reference: NCR# 7265; the requirement for  
dual attachment for TB-SPR-N-2 has been eliminated from Diagram. Diagram  
has been updated to show 1 FDDI cable.  
Note: Attachment "IP Address Assignment (Host)" needs to be updated with  
the same changes; dated 6/13/97.  
**Action:** Correction to port numbers were made. Doc#: 420-TD-049-004; dated 6/26/97  
**Status:** Closed, 6/27/97

### Hardware Diagram:

**NCR#:** 7277  
**Defect:** Doc#: 420-TD-051-003  
CSS-NSIDC-1: Diagram shows 4GB HD whereas Interrogation shows 6GB  
MSS-NSIDC-1: Diagram shows 4GB HD whereas Interrogation shows 1.5GB  
**Action:** Hardware Diagram changed to correct amount of GB.  
6/25/97 Randy Bollinger, M&O/SEO Lead Engineer

The MSS-NSIDC-1 diagram actually has 2GB of storage rather than the 1.5GB described in the defect above. The 2GB amount is the actual physical device amount, the 1.5GB found during the interrogation was the usable (i.e available) amount.. Doc.#: 420-TD-051-004; Dated 6/26/97.

Hardware Diagram changed to correct amount of GB.

**Status:** Closed, 6/27/97

### **Floor Plan:**

**NCR#:** 7263

**Defect:** T-AIT-3; change room number; from: RM 256 to: RM 252  
T-AIT-1; change room number; from: RM 252D to: RM 252  
T-SPR-3; change room number; from: RM 252C to: RM 252

**Action:** Floor plan changed with correct room numbers, dated 6/24/97

**Status:** Closed, 6/27/97

### **Turnover**

Attendees at the Physical Configuration Audit (PCA) of Pre-Release B Hardware turnover meeting at National Snow and Ice Data Center (NSIDC) on June 16 and 17, 1997 were:

Giuseppe Calavaro  
Felicia Harris  
Lonney Head  
Jerry Klein  
David Morgan  
Joe Spyrison  
Vincent Troisi  
Lisa Monro-Cline  
Ron Weaver

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# Abbreviations and Acronyms

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CCB	Configuration Change Board
CCR	Configuration Change Request
COTS	Commercial Off-the-Shelf
DAAC	Distributed Active Archived Center
ECS	EOSDIS Core System
EDC	EROS Data Center (DAAC)
EOSDIS	Earth Observing System Data and Information System
ESDIS	Earth Science Data and Information System
GSFC	Goddard Space Flight Center (DAAC)
I&T	Integration and Test
LaRC	Langley Research Center (DAAC)
M&O	Maintenance and Operations
NCR	Nonconformance Report
NSIDC	National Snow and Ice Data Center (DAAC)
PCA	Physical Configuration Audit
QA	Quality Assurance
SSI&T	Science Software Integration and Test
VCATS	Vendor Costs and Tracking System

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