

**SOFTWARE TEST PLAN
FOR THE
MODERATE RESOLUTION IMAGING SPECTRORADIOMETER
(MODIS)
LEVEL 1B SOFTWARE SYSTEM**

M350-CD-001-001

Preliminary

Developed by
The MODIS Characterization Support Team

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1. SCOPE

1.1 Identification

This Software Test Plan (STP) describes the Formal Qualification Test (SAT) activities and the environment in which those activities will take place for the Moderate Resolution Imaging Spectroradiometer (MODIS) Level 1B Production Software. The MODIS Level 1B production software is composed of three Computer Software Configuration Items (CSCIs):

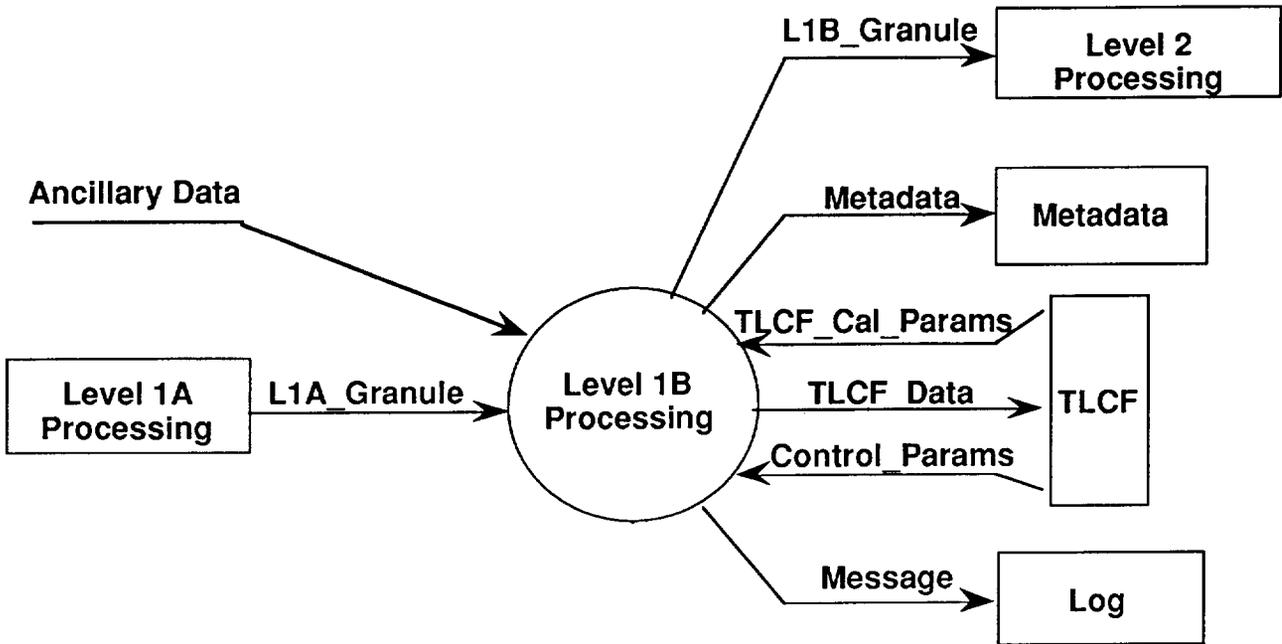
Within Granule Processing
(1) L1B CSCI, L1B-01

Cross Granule Porcessing
(2) Xgran_SD CSCI, L1B-02
(3) Xgran_SRCA CSCI, L1B-03

The *Software Requirements for the Moderate Resolution Imaging Spectroradiometer (MODIS) Level 1B Software System* establishes the MODIS Level 1B software requirements. The *MODIS Level 1B Software Development Plan*, describes the validation and verification procedures, SAT and qualification procedures established to assure that the MODIS Level 1B software fulfills these requirements. Unit testing and integration testing will be performed during development on the MODIS Characterization Support Team (MCST) Computing Resource computers, and the results will be placed in the Software Development Folders. This document addresses the system level SAT activities which take place after delivery of the software to the MODIS Science Data Support Team (SDST) as part of the formal acceptance procedure. Regression testing will take place upon delivery of subsequent updates to the software and will be executed using this STP.

1.2 System Overview

The MODIS Level 1B software implements the calibration algorithms documented in the MODIS Level 1B Algorithm Baseline Theoretical Document (ATBD). Figure 1 is the context diagram for the software system.



Level 1B Processing Context

Figure 1. MODIS Level 1B Context Diagram

The L1B CSCI (L1B-01) generates MODIS Level 1B standard data product which contains the calibrated MODIS sensor data, in scientific units. This product is archived at the Goddard Space Flight Center (GSFC) Distributed Active Archive Center (DAAC).

The Xgran_SD CSCI (L1B-02) processes the data acquired during each period when Solar Diffuser (SD) door is open to calculate and store an average coefficient for the event, and to determine and store the trend values for the entire population of average Solar Diffuser coefficients. Xgran_SD CSCI (L1B-02) also generates a special data product containing the raw SD and Solar Diffuser Stability Monitor (SDSM) data which is archived at the GSFC DAAC.

The Xgran_SRCA CSCI (L1B-03) processes the data acquired during each period of SpectroRadiometric Calibration Assembly (SRCA) activity according to the mode in which the SRCA was active. The radiometric and spectral data are used to monitor MODIS sensor calibration. The spatial calibration information describes spatial misregistration of the detectors caused by shifts in the focal planes. Xgran_SRCA CSCI (L1B-03) generates a special data product containing the raw SRCA data which is archived at the GSFC DAAC.

1.3 Document Overview

The purpose of this document is to describe the Formal Qualification Test Plan for the MODIS Level 1B CSCIs. It contains the following information as specified in *Defense System Software Development, DOD-STD-2167A*.

- | | |
|-----------|---|
| Section 1 | This section identifies the MODIS Level 1B CSCIs, contains a brief system overview and summarizes the purpose and contents of this document. |
| Section 2 | This section contains a list of referenced documents. |
| Section 3 | This section specifies the test environment that will be used in the testing of the MODIS Level 1B CSCIs. It includes a description of the hardware, software and personnel resources needed for installation, testing and control. |
| Section 4 | This section identifies the formal qualification tests. |
| Section 5 | This section describes the data reduction and analysis procedures to be used during and following the tests. |
| Section 6 | This section contains an alphabetical listing of acronyms and abbreviations, and their meanings as used in this document. |

1.4 Relationship to Other Plans

The MODIS Level 1B Software Development Plan, Draft, 11 August 1994, serves as the parent document for this STP.

2.0 RELATED DOCUMENTATION

The following documents are referenced in this specification.

2.1 Parent Documents

- (a) *MODIS Calibration Support Team Management Plan*, NASA Technical Memorandum, under development, MODIS Technical Report Series.
- (b) *Software Requirements for the Moderate Resolution Imaging Spectroradiometer (MODIS) Level 1B Software System, Version 1*, Release 1, June 28, 1995.
- (c) *MODIS Level 1B Software Design Document*, Preliminary, June 30, 1995

2.2 Applicable Documents

- (a) *MODIS Level 1B Software Development Plan*, Draft, 11 August 1994.
- (b) *MODIS Software Management Plan*, NASA Technical Memorandum, DRAFT, MODIS Technical Report Series, May 25, 1995.
- (c) *MODIS Software Development Standards and Guidelines*, Version 1, February 15, 1995.
- (d) *Product Specification DIDS, Detailed Design*, NASA DID P400, NASA Software Documentation Standard, Software Engineering Program, NASA-STD-1200-91.
- (e) *Defense System Software Development*, DOD-STD-2167A, 29 Feb 1988

2.3 Information Documents

- (a) *MODIS Algorithm Theoretical Basis Document*, December 22, 1994.
- (b) *Structured Analysis and System Specification*, Tom DeMarco, Yourdon Press, 1979.
- (c) *Introduction to Software Verification and Validation*, James S. Collofello, Arizona State University, SEI Curriculum Module SEI-CM-13-1.1, December 1988

3. SOFTWARE TEST ENVIRONMENT

3.1 Software Items

The software items required to perform the formal qualification testing and their purpose are listed in Tables 1 and 2. Table 1 identifies the items to be supplied by MCST. Table 2 identifies the items to be supplied by SDST. There are no security issues because the data and the software are unclassified.

Software Item	Purpose
MODIS Level 1B Within Granule c source code	L1B-01 Within Granule calibration implementation code
MODIS Level 1B SD Cross Granule c source code	L1B-02 Solar Diffuser Cross Granule implementation code
MODIS Level 1B SRCA Cross Granule c source code	L1B-02 SRCA Cross Granule implementation code
MODIS look up data tables Black Body Radiance data table Irradiance of the Sun data table A (thermal gain) data table B (thermal offset) data table Blackbody Reflected Radiance data table Solar Diffuser Coefficients data table Detector BRDF data table Q (thermal nonlinear term) data table Blackbody Emissivity data table Blackbody Term data table Calibration parameters data table Reflective Detector Information data table Within Orbit Variability data table Blackbody Rho data table Earth-view Rho data table RSR (Relative Spectral Response) data table Solar Diffuser Coefficients History data table Solar Diffuser Trend Information data table Solar Diffuser Stability Monitor data table BRDF data table	Test data for input to L1B-01, L1B-02 and L1B-03
MODIS Level 1B data product	Verification for L1B-01
MODIS Level 1A data product	Input for L1B-01
Cross Granule Working Files	Input for L1B-02 and L1B-03
Log files	Verification of L1B-01, L1B-02 and L1B-03

Table 1. Software Items to be Supplied by MCST

Software Item	Purpose
Product Generation Executive (PGE)	Processing shell which initiates and controls execution of the MODIS Level 1B CSCIs
UNIX Operating system Version specified by SDST at time of SAT	Operating system software for UNIX computer network in SDST TLCF
PGS Toolkit	Provide memory management tools for Level 1B CSCIs. Provide means to transmit processing status and information from Level 1B CSCIs to production system operator. Provide access to disk files for Level 1B CSCIs.
Heirarchical Data Format (HDF) software	Provide file format capability for L1B-01 data product

Table 2. Software Items to be Supplied by SDST

3.2 Hardware and Firmware Items

The hardware items required to perform the formal qualification testing and their purpose are listed in Table 3.

Hardware Item	Purpose
A minimum of 4 Gbytes of disk storage	Provide storage for MODIS Level 1B test data, source code, executables and output for SAT
UNIX workstation, model and configuration TBD	Platform on which L1B-01, L1B-02 and L1B-03 will be tested
Postscript printer vendor and model TBD	Provide hardcopy device
Tape drive type TBD	Provide means to load source code and test data onto test platform for SAT.
Magnetic tape compatible with tape drive TBD	Provide means to transport source code and test data from MCST to SDST

Table 3. Hardware Items to Support SAT

3.3 Proprietary Nature and Government Rights

The source code which makes up the MODIS Level 1B CSCIs and all data files used for testing become the property of NASA upon successful completion of the System Acceptance Testing (SAT) at SDST. All hardware in the test environment is supplied by NASA and belongs to the U. S. Government.

3.4 Installation, Testing and Control

MCST will hold a test readiness review and a dry run of the actual tests on the development system prior to delivery to validate the SAT procedure. SDST personnel will install the three CSCIs on the SDST TLCF and create executable modules which will be tested by MCST personnel in coordination with SDST personnel according to this STP and the Software Test Description (STD).

SDST is responsible for maintenance of the test environment.

4.0 FORMAL QUALIFICATION TEST IDENTIFICATION

4.1 MODIS L1B CSCI (L1B-01)

The following sections describe the scope of testing for the MODIS L1B CSCI.

4.1.1 General Test Requirements

The following general requirements apply to the formal qualification tests of the MODIS L1B CSCI.

A random selection of at least 10% of the code shall be inspected for conformance to syntax and standards defined in *MODIS Software Development Standards and Guidelines*, in accordance with the *MODIS Level 1B Software Development Plan* and the *MODIS Software Management Plan* .

Size and execution time shall be measured.

Testing shall be performed using nominal, extreme and erroneous input.

Error detection, error recovery and error reporting shall be tested.

External interfaces shall be validated

4.1.2 Test Classes

The following classes of tests will be performed during SAT of the MODIS L1B CSCI (L1B-01):

Expected value testing - values from the expected classes of the input domain will be used to test nominal performance. This class of testing supports measurement of size and execution time, functionality using nominal input, and validation of external interfaces.

Boundary value testing - values from the boundaries of the input domain and derived test cases from the output domain will be used to perform testing of extreme input and to support error detection, recovery and reporting.

Stress testing - maximum capacity of the input domain, including concurrent execution of multiple processes, will be used to test external interfaces, error handling and size and execution time.

Erroneous input - erroneous values in the input domain will be used to perform testing of functionality and error handling.

Timing testing - wall clock time, CPU time and I/O time will be recorded.

Data validation testing - output data will be validated by comparison with a baseline and by acceptable results in downstream applications.

Desk check testing - both code and output will be manually inspected and analyzed.

4.1.3 Test Levels

SAT of the MODIS Level 1B Within Granule CSCI will be accomplished at the

system level to evaluate conformance to system performance requirements;

CSCI to CSCI level to evaluate conformance to CSCI requirements and to evaluate compliance with external interface requirements;

CSCI level to validate output;

Computer Software Unit (CSU) level to evaluate conformance to coding standards.

4.1.4 Test Definitions

The following subparagraphs identify and describe each formal qualification test to be conducted on L1B-01. Test personnel must have limited access to the SDST disk file system. Test personnel must have access to SDST TLCF workstation during performance of these tests. All problems will be reported on an Incident Report (IR) form and brought under SDST control.

4.1.4.1 External Interfaces Test (TST-01.01)

- a. Purpose. The purpose of this test is to ensure that the requirements for handling external interfaces by the L1B CSCI are satisfied and that these interfaces function as designed.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI to CSCI level.
- d. Test Class. Expected Value, Boundary Value, Data Validation.
- e. Qualification Method. Demonstration, Inspection
- f. SRS Reference. IF01, IF04, IF05, IF06, IF07, IF08, IF09, IF10, IF12, IF13, IF18
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of comparisons of output files with the baseline.

4.1.4.2 Functional Performance Test (TST-01.02)

- a. Purpose. The purpose of this test is to verify nominal performance in the absence of error conditions.
- b. Special Requirements. None.
- c. Test Level. System level, CSCI level, and CSU level.
- d. Test Class. Expected Value, Erroneous Input, Data Validation, Desk Check.
- e. Qualification Method. Demonstration, Inspection.

- f. SRS Reference. IF03, IF07, FN01, FN03 - FN13, FN15 - FN21, FN23 - FN25
- g. Type of Data Recorded Observed behavior during demonstration and results of inspection of code, operating system logs and comparison of log files with the baseline.

4.1.4.3 Execution Time Test (TST-01.03)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI level.
- d. Test Class. Stress, Timing.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded Observed behavior during demonstration, inspection of output logs containing verification of wall clock times and completion status.

4.1.4.4 Error Handling Test (TST-01.04)

- a. Purpose. The purpose of this test is to ensure that the requirements for error handling and reporting are satisfied.
- b. Special Requirements. None.
- c. Test Level. System level, CSCI level and CSU level.
- d. Test Class. Expected Value, Boundary Value, Erroneous Input, Stress, Data Validation, Desk Check.
- e. Qualification Method. Demonstration, Inspection.

- f. SRS Reference. IF10, IF12, IF13, IF19, PR01, PR03
- g. Type of Data Recorded Observed behavior during demonstration and results of inspection of output logs and code.

4.1.4.5 Sizing Test (TST-01.05)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI level.
- d. Test Class. Boundary Value, Stress.
- e. Qualification Method. Demonstration, Inspection
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of operating system logs and output files.

4.2 Xgran_SD CSCI (L1B-02)

The following sections describe the scope of testing for L1B-02.

4.2.1 General Test Requirements

The following general requirements apply to the formal qualification tests of the Xgran_SD CSCI.

A random selection of at least 10% of the code will be inspected for conformance to syntax and standards defined in *MODIS Software Development Standards and Guidelines*, in accordance with the *MODIS Level 1B Software Development Plan* and the *MODIS Software Management Plan* .

Size and execution time will be measured.

Testing will be performed using nominal, extreme and erroneous input.

Error detection, error recovery and error reporting will be tested.

External interfaces will be validated

4.2.2 Test Classes

The following classes of tests will be performed during SAT of the Xgran_SD CSCI:

Expected value testing - values from the expected classes of the input domain will be used to test nominal performance. This class of testing supports measurement of size and execution time, functionality using nominal input, and validation of external interfaces.

Boundary value testing - values from the boundaries of the input domain and derived test cases from the output domain will be used to perform testing of extreme input and to support error detection, recovery and reporting.

Stress testing - maximum capacity of the input domain, including concurrent execution of multiple processes, will be used to test external interfaces, error handling and size and execution time.

Erroneous input - erroneous input will be used to test error handling, error recovery and error reporting.

Output validation testing - output data will be validated by comparison with a baseline and by demonstration.

Desk check testing - both code and output will be manually inspected.

4.2.3 Test Levels

SAT of the Xgran_SD CSCI will be accomplished at the

system level to evaluate conformance to system performance requirements;

CSCI to CSCI level to evaluate compliance with external interface requirements;

CSCI level to evaluate conformance to CSCI requirements;

CSU level to evaluate conformance to coding standards.

4.2.4 Test Definitions

The following subparagraphs identify and describe each formal qualification test to be conducted on L1B-02. Test personnel must have access to the SDST TLCF during performance of these tests. All problems will be reported on an Incident Report (IR) form and brought under SDST control.

4.2.4.1 External Interfaces Test (TST-02.01)

- a. Purpose. The purpose of this test is to ensure that the requirements for handling external interfaces by the Xgran_SD CSCI are satisfied and that these interfaces function as designed.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI to CSCI.
- d. Test Class. Expected Value, Boundary Value, Erroneous Input, Output Validation, Desk Check.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. IF01, IF04, IF05, IF06, IF08, IF09, IF10, IF12, IF13, IF18
- g. Type of Data Recorded. Observed behavior during demonstration and inspection of output.

4.2.4.2 Functional Performance Test (TST-02.02)

- a. Purpose. The purpose of this test is to ensure that the requirements for input from the user and output to the user are satisfied in the absence of error conditions.

- b. Special Requirements. None.
- c. Test Level. System level, CSCI level and CSU level.
- d. Test Class Expected Value, Boundary Value, Erroneous Input, Desk Check.
- e. Qualification Method. Demonstration, Inspection, Output Validation.
- f. SRS Reference. .IF03, FN03, FN04, FN11, FN12, FN16, FN17, FN18, FN19, FN21, PR02
- g. Type of Data Recorded Observed behavior during demonstration, and results of inspection of output.

4.2.4.3 Execution Time Test (TST-02.03)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software..
- b. Special Requirements. None.
- c. Test Level. System level and CSCI level.
- d. Test Class. Stress, Timing.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded Observed behavior during demonstration, inspection of output logs containing verification of wall clock times and completion status.

4.2.4.4 Error Handling Test (TST-02.04)

- a. Purpose. The purpose of this test is to ensure that the requirements for error handling and reporting are satisfied.
- b. Special Requirements. None.

- c. Test Level. System level and CSCI level.
- d. Test Class. Stress, Erroneous Input, Boundary Value, Desk Check, Output Validation.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. IF10, IF12, IF13, IF19, PR01, PR03
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of output.

4.2.4.5 Sizing Test (TST-02.05)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software.
- b. Special Requirements. None.
- c. Test Level. CSCI level.
- d. Test Class. Stress, Boundary Value.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of operating system logs.

4.3 Xgran_SRCA CSCI (L1B-03)

The following sections describe the scope of testing for L1B-03.

4.3.1 General Test Requirements

The following general requirements apply to the formal qualification tests of the Xgran_SRCA CSCI.

A random selection of at least 10% of the code will be inspected for conformance to syntax and standards defined in *MODIS Software Development Standards and Guidelines*, in accordance with the *MODIS Level 1B Software Development Plan* and the *MODIS Software Management Plan* .

Size and execution time will be measured.

Testing will be performed using nominal, extreme and erroneous input.

Error detection, error recovery and error reporting will be tested.

External interfaces will be validated

4.3.2 Test Classes

The following classes of tests will be performed during SAT of the Xgran_SRCA CSCI:

Expected value testing - values from the expected classes of the input domain will be used to test nominal performance. This class of testing supports measurement of size and execution time, functionality using nominal input, and validation of external interfaces.

Boundary value testing - values from the boundaries of the input domain and derived test cases from the output domain will be used to perform testing of extreme input and to support error detection, recovery and reporting.

Stress testing - maximum capacity of the input domain, including concurrent execution of multiple processes, will be used to test external interfaces, error handling and size and execution time.

Erroneous input - erroneous input will be used to test error handling, error recovery and error reporting.

Output validation testing - output data will be validated by comparison with a baseline and by demonstration.

Desk check testing - both code and output will be manually inspected.

4.3.3 Test Levels

SAT of the Xgran_SRCA CSCI will be accomplished at the

system level to evaluate conformance to system performance requirements;

CSCI to CSCI level to evaluate compliance with external interface requirements;

CSCI level to evaluate conformance to CSCI requirements;

CSU level to evaluate conformance to coding standards.

4.3.4 Test Definitions

The following subparagraphs identify and describe each formal qualification test to be conducted on L1B-03. Test personnel must have access to the SDST TLCP during performance of these tests. All problems will be reported on an Incident Report (IR) form and brought under SDST control.

4.3.4.1 External Interfaces Test (TST-03.01)

- a. Purpose. The purpose of this test is to ensure that the requirements for handling external interfaces by the Xgran_SRCA CSCI are satisfied and that these interfaces function as designed.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI to CSCI.
- d. Test Class. Expected Value, Boundary Value, Erroneous Input. Output Validation, Desk Check.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. IF01, IF04, IF05, IF06, IF08, IF09, IF10, IF12, IF13, IF18, IF19
- g. Type of Data Recorded. Observed behavior during demonstration and inspection of output.

4.3.4.2 Functional Performance Test (TST-03.02)

- a. Purpose. The purpose of this test is to ensure that the requirements for input from the user and output to the user are satisfied in the absence of error conditions.
- b. Special Requirements. None.
- c. Test Level. System level, CSCI level and CSU level.
- d. Test Class. Expected Value, Boundary Value, Erroneous Input, Desk Check.
- e. Qualification Method. Demonstration, Inspection, Output Validation.
- f. SRS Reference. IF03, FN05, FN06, FN07, FN11, FN12, FN16, FN17, FN18, FN19, FN21
- g. Type of Data Recorded. Observed behavior during demonstration, and results of inspection of output.

4.2.4.3 Execution Time Test (TST-03.03)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI level.
- d. Test Class. Stress, Timing.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded. Observed behavior during demonstration, inspection of output logs containing verification of wall clock times and completion status.

4.3.4.4 Error Handling Test (TST-03.04)

- a. Purpose. The purpose of this test is to ensure that the requirements for error handling and reporting are satisfied.
- b. Special Requirements. None.
- c. Test Level. System level and CSCI level.
- d. Test Class. Stress, Erroneous Input, Boundary Value, Desk Check, Output Validation.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. IF10, IF12, IF13, IF19, PR01, PR03
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of output.

4.3.4.5 Sizing Test (TST-03.05)

- a. Purpose. The purpose of this test is provide planning information and to provide a measure of use of computing resources by the software.
- b. Special Requirements. None.
- c. Test Level. CSCI level.
- d. Test Class. Stress, Boundary Value.
- e. Qualification Method. Demonstration, Inspection.
- f. SRS Reference. Team Leader Working Agreement 3.4.2 (f & g)
- g. Type of Data Recorded. Observed behavior during demonstration and results of inspection of operating system logs.

4.4 Test Schedule

Below is the preliminary schedule for SAT, to begin in March, 1996, date TBD.

Activity	Description	Time Required
Establish test environment	Install source code and test data; create executable modules; provide system access for test personnel	8 hours
TST-01.01	External Interfaces Test	4 hours
TST-01.02	Functional Performance Test	4 hours
TST-01.03	Execution Time Test	4 hours
TST-01.04	Error Handling Test	4 hours
TST-01.05	Sizing Test	4 hours
TST-02.01	External Interfaces Test	4 hours
TST-02.02	Functional Performance Test	4 hours
TST-02.03	Execution Time Test	4 hours
TST-02.04	Error Handling Test	4 hours
TST-02.05	Sizing Test	4 hours
TST-03.01	External Interfaces Test	4 hours
TST-03.02	Functional Performance Test	4 hours
TST-03.03	Execution Time Test	4 hours
TST-03.04	Error Handling Test	4 hours
TST-03.05	Sizing Test	4 hours
Review Test Results	Examine results and discuss with SDST	20 hours
Prepare Software Test Report (STR)	Document results of SAT in Software Test Report	40 hours

Table 4. SAT Test Schedule

5.0 DATA RECORDING, REDUCTION AND ANALYSIS

Upon completion of SAT, the test files supplied by MCST and used for SAT become the property of NASA and may be retained at the discretion of SDST. Data recording will consist of recording the test results, the STR, retention of IRs documenting problems during testing, notes taken by test personnel, and hardcopy used for inspection and desk check. No data reduction or analysis activities will occur during SAT.

Problems detected during SAT activities will be recorded on an IR. As IRs are produced, they will be first provided to the SDST Test Manager to be assigned a severity and a priority, then provided to the software developers for correction. After the problem is corrected, the IRs will be placed in the software development folders, which will be updated and maintained in accordance with the guidelines of the *MODIS Level 1B Software Management Plan*. An example of an IR is shown in Figure 2. Following Figure 2 is an explanation of the IR format.

MODIS LEVEL1B INCIDENT REPORT

TO: SDST

LIB RELEASE #:

INCIDENT REPORT #:

PRIORITY:

Critical

Major

Minor

Nuisance

Documentation

CSCI NAME: _____

REPORT DATE: _____

DOCUMENT NAME: _____

EST. COMPLETION DATE: _____

PROBLEM DESCRIPTION:

ANALYST NAME: _____

DATE ASSIGNED: _____

PHONE: _____

DATE COMPLETED: _____

ORGANIZATION: _____

TOTAL ANALYSIS TIME: _____

RECOMMENDED SOLUTION:

IMPACT:

SIGNATURE OF APPROVAL: _____

DATE: _____

CORRECTOR'S NAME: _____

VER/REL. _____

PHONE: _____

CORRECTION DATE: _____

ORGANIZATION: _____

TOTAL CORRECTION TIME: _____

IMPLEMENTATION SOLUTION:

Figure 2. MODIS Level 1B Incident Report Form

L1B Release Number - The L1B release number in which the incident occurred.

Incident Report Number - The incident number assigned for tracking.

Priority - The priority of the IR. Priority levels are critical, major, minor, nuisance, and documentation.

CSCI Name - The name of the CSCI to which the report applies.

Report Date - The date this report was filed.

Document Name - Document name(s) affected by the incident or the documentation where a problem was found.

Estimated Completion Date - The scheduled estimated completion date.

Problem Description - A description of the incident and the conditions, inputs, and equipment configuration under which the incident arises. A description of the activities leading up to the incident occurrence. Sufficient incident information to permit duplication and analysis. Include relationship to other reported incidents. (Note CSU name(s) if known.)

Analyst Name - The name of the individual assigned to analyze the problem.

Date Assigned - The date the analyst was assigned.

Phone - The phone number of the analyst.

Date Completed - The date the analysis was completed.

Organization - The organization of the analyst.

Total Analysis Time - The time required to analyze the reported problem.

Recommended Solution - After analysis of the incident, the recommended solution and alternative solutions (if available). The nature of the recommended solution with a short descriptive phrase. When applicable, supporting rationale and test results.

Impact - The cost, schedule, and interface impacts if the solution is approved. Also, performance impacts if the solution is not approved. As applicable, include the impact on the other systems employment, integrated logistics support, system resource, training, etc.

Signature of Approval - Signature to be designated by the cognizant configuration control authority.

Date - Date signed by approving official.

Corrector's Name - The name of the individual correcting the incident.

Version/Release Number - The version or release in which the incident will be corrected.

Phone Number - The phone number of the individual correcting the incident.

Correction Date - The date the incident was corrected.

Organization - The organization of the individual correcting the incident.

Total Correction Time - The time required to correct the incident.

Implementation Solution - A brief description of the implementation solution to the incident.

6. NOTES

6.1 Acronyms and Abbreviations

ATBD	Algorithm Baseline Theoretical Document
CRT	Cathode Ray Tube
CSC	Computer Software Component
CSCI	Computer Software Configuration Item
CSU	Computer Software Unit
DAAC	Distributed Active Archive Center
DID	Data Item Description
GSFC	Goddard Space Flight Center
HDF	Heirarchical Data Format
IR	Incident Report
Mbytes	Megabytes
MCST	MODIS Characterizxation Support TEam
MODIS	Moderate Resolution Imaging Spectroradiometer
NASA	National Aeronautic and Space Agency
OSF	Open Software Foundation
PGE	Product Generation Executive
PGS	Product Generation System
SAT	System Acceptance Testing
SDP	Science Data Product
BSDST	Science Data Support Team
SRS	Software Requirements Specification
STD	Software Test Description
STP	Software Test Plan
STR	Software Test Report
TBD	To Be Determined
TLCF	Team Leader Compute Facility

6.2 Glossary

7.0 APPENDICES

7.1 MODIS Level 1B Requirements Traceability Matrix

Requirement	Test
IF01 Initiate Execution --	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF02 Deleted	
IF03 Terminate Execution upon Completion	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
IF04 Input Data	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF05 Ancillary Input Data	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF06 Input Data Limitation	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF07 Create Level 1B Data Product	External Interfaces Tests TST-01.01 Functional Performance Test TST-01.02
IF08 Create Metadata	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF09 Append Metadata	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF10 MODIS Processing Log	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01 Error Handling Tests TST-01.04, TST-02.04, TST-03.04
IF11 Concurrent Execution	
IF12 Termination Report	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01 Error Handling Tests TST-01.04, TST-02.04, TST-03.04
IF13 Alarm Messages.	Error Handling Tests TST-01.04, TST-02.04, TST-03.04

Requirement	Test
IF14 Overlapping Data	
IF15 Sun Angles	
IF16 Pixel Angles	
IF17 Lunar Vector	
IF18 Normal Termination.	External Interfaces Tests TST-01.01, TST-02.01, TST-03.01
IF19 Abnormal Termination	Error Handling Tests TST-01.04, TST-02.04, TST-03.04
FN01 Processing Scope.	Functional Performance Test TST-01.02
FN02 Reprocessing	
FN03 Solar Diffuser	Functional Performance Tests TST-01.02, TST-02.02
FN04 Solar Diffuser Stability Monitor	Functional Performance Tests TST-01.02, TST-02.02
FN05 SRCA Radiometric Mode	Functional Performance Tests TST-01.02, TST-03.02
FN06 SRCA Spatial Mode	Functional Performance Tests TST-01.02, TST-03.02
FN07 SRCA Spectral Mode	Functional Performance Tests TST-01.02, TST-03.02
FN08 Space View	Functional Performance Test TST-01.02
FN09 Black Body	Functional Performance Test TST-01.02
FN10 Lunar Look	Functional Performance Test TST-01.02
FN11 Calibration Coefficients	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN12 Calibration Updates	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN13 Earth View Data	Functional Performance Test TST-01.02
FN14 Deleted	
FN15 Engineering Data.	Functional Performance Test TST-01.02
FN16 Quality Assurance	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02

Requirement	Test
FN17 Input Data Verification	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN18 Metadata Contents	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN19 Data Format	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN20 Data Contents	Functional Performance Test TST-01.02
FN21 Calibration Sources	Functional Performance Tests TST-01.02, TST-02.02, TST-03.02
FN22 Non-Nominal Conditions	
FN23 Radiance Sensor Data	Functional Performance Test TST-01.02
FN24 Infrared Sensor Data	Functional Performance Test TST-01.02
FN25 Reflectance Sensor Data	Functional Performance Test TST-01.02
PR01 Error Recovery	Error Handling Tests TST-01.04, TST-02.04, TST-03.04
PR02 Trending	Functional Performance Test TST-02.02
PR03 Error Abort	Error Handling Test TST-01.04
OR01 Scope	
OR02 Toolkits	
OR03 Maintainability	
OR04 Portability	
OR05 Reliability	
OR06 Evolution	