

Clouds and the Earth's Radiant Energy System (CERES)

Data Management System

CERES Instantaneous SARB (Subsystem 5.0)

Release 5 Test Plan Version 6

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SW Delivered to CM: August 2012
Document Date: August 2012

Document Revision Record

The Document Revision Record contains information pertaining to approved document changes. The table lists the date the Software Configuration Change Request (SCCR) was approved, the Release and Version Number, the SCCR number, a short description of the revision, and the revised sections. The document authors are listed on the cover. The Head of the CERES Data Management Team approves or disapproves the requested changes based on recommendations of the Configuration Control Board.

Document Revision Record

SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
06/07/01	R3V2	267	<ul style="list-style-type: none"> • Indicated in bold, red, italicized print which sections were to be skipped for SCCR #267 testing. • Reordered file name listings and diff statements so that all the files in a given directory can be listed or diffed before files in other directories are listed or diffed. • Redirected output from HDF comparison programs to separate files. • Updated format to comply with standards. 	Secs. 2.2.1, 2.2.2, 3.1, & 3.2 Sec. 3.3 Secs. 3.3.2.4.1, 3.3.2.4.2, & 3.3.2.6 All
12/07/01	R3V3	315	<ul style="list-style-type: none"> • Removed red-lettered statements directing tester to skip indicated sections. • Updated timing information. • Added instructions to execute clean-up script prior to generating any files for a test case. • Added instructions for copying input files from other subsystems to the appropriate directories to instructions for testing the subset mode. • Updated format to comply with standards. 	Secs. 2.0 & 3.0 Sec. 3.3 Sec. 3.3 Sec. 3.3 All
12/20/02	R3V4	408	<ul style="list-style-type: none"> • Removed sections pertaining to the PGE CER5.2P1. • Removed the separate test instructions for the Subset Mode and included evaluation steps for the CRSVB (subsetted CRS) product with those for evaluating the CRSB product. References to "Full-Hour MODE" and "Subset MODE" were also removed. • Added separate test instructions for the Terra satellite. • Updated format to comply with standards. 	Sec. 3.0 Sec. 3.0 Sec. 3.0 All

Document Revision Record

SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
01/27/03	R3V5	419	<ul style="list-style-type: none"> Added sections pertaining to the PGE CER5.3P1. Updated format to comply with standards. 	<p>Sec. 3.0</p> <p>All</p>
07/30/03	R3V6	458	<ul style="list-style-type: none"> Changed PGE5.2 to 5.0P1. Updated run times. Modified filenames. Modified description of script. Updated format to comply with standards. 	<p>Sec. 3.1.2.4</p> <p>Secs. 3.2.1.4, 3.4.1.1.2, & 3.6.1.1.2</p> <p>Secs. 3.2 & 3.6</p> <p>Sec. 3.4.1.1</p> <p>All</p>
09/11/03	R3V7	468	<ul style="list-style-type: none"> Added sections pertaining to new test cases for PGE CER5.0P1. Added sections pertaining to new PGE CER5.4P1. Updated run times. Updated format to comply with standards. 	<p>Secs. 3.2, 3.3, & 3.4</p> <p>Sec. 3.9</p> <p>Secs. 3.2.1.4, 3.3.1.4, & 3.4.1.4</p> <p>All</p>
09/30/03	R3V8	469	<ul style="list-style-type: none"> Changed data date from 2001070500 to 2001071200. Updated format to comply with standards. 	<p>Secs. 3.8.1.1, 3.8.2.1, 3.8.2.2, 3.8.2.3, & 3.8.3</p> <p>All</p>
01/16/04	R3V9	498	<ul style="list-style-type: none"> Removed section for Version 3 MODIS testing of CER5.0P1. Changed testing strings to predefined variables. Updated format to comply with standards. 	<p>Sec. 3.2</p> <p>All</p> <p>All</p>
02/26/04	R3V10	505	<ul style="list-style-type: none"> In the Log and Status File Results sections, the second LogReport in each filename was changed to LogStatus. The Total Run Time was changed. Updated format to comply with standards. 	<p>Secs. 3.1.2.1, 3.2.2.1, 3.3.2.1, 3.5.2.1, 3.7.2.1, & 3.8.2.1</p> <p>Sec. 3.2.1.4</p> <p>All</p>
03/24/04	R3V11	515	<ul style="list-style-type: none"> Modified description of PGE CER5.4P1. Updated SCCR number in tar filenames. Added filenames to list of outputs. Modified runtimes for PGE CER5.4P1. Added comparisons for new filenames. Updated App. B directory structure chart. 	<p>Sec. 1.2.4</p> <p>Sec. 2.1</p> <p>Sec. 3.8.1.1</p> <p>Sec. 3.8.1.1.2</p> <p>Sec. 3.8.2.2</p> <p>Appendix B</p>

Document Revision Record

SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
03/24/04 (Cont'd)	R3V11	515	<ul style="list-style-type: none"> Updated format to comply with standards. 	All
06/28/04	R4V1	541	<ul style="list-style-type: none"> Changed Release 3 to Release 4. Added MYD08 to aerosol filenames. Added tar file name to instructions. Corrected errors in instructions. Changed Date and Instance variables. Changed run time results. Added step for copying input files. Modified 5.0P1 comparison software script. Corrected step for copying input files used in PGE 5.1P1. 	Sec. 1.1 Sec. 1.2.1 Sec. 2.1 Sec. 2.2.2 Secs. 3.2.1.1, 3.3.1.1, 3.5.1.1, & 3.6.1.1 Secs. 3.2.1.4, 3.3.1.4, 3.5.1.1.2, & 3.6.1.1.2 Secs. 3.2.1.1 & 3.3.1.1 Secs. 3.2.2.3 & 3.3.2.3 Secs. 3.4.1.1, 3.5.1.1, 3.6.1.1
06/28/04 (Cont'd)	R4V1	541	<ul style="list-style-type: none"> Correction: changed 5.0 to 5.1. Changed hcmp to HDF Post-Processor. Modified 5.1P1 comparison software script. Added Section 3.6 for PGE 5.1 Aqua test case. Added Section 3.10 for PGE 5.4 Aqua test case. Updated the way HTML code is developed. Updated format to comply with standards. 	Secs. 3.4.1.3, 3.4.1.5, 3.5.2.3, & 3.5.2.5 Secs. 3.4.1.6, 3.5.2.6, 3.7.1.4, & 3.8.2.4 Secs. 3.4.1.4, 3.5.2.4, 3.7.1.3, & 3.8.2.3 Sec. 3.6 Sec. 3.10 Secs. 3.9 & 3.10 All
03/11/05	R4V2	580	<ul style="list-style-type: none"> Added FM1 and FM2 tests for Terra. Updated Test summary for Terra cases. Added FM3 and FM4 tests for Aqua. Updated Test summary for Aqua cases. Updated format to comply with standards. 	Sec. 3.9.1.1 Sec. 3.9.1.1.2 Sec. 3.10.1.1 Sec. 3.10.1.1.2 All

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
10/10/05	R4V3	597	<ul style="list-style-type: none"> Added use of run_make scripts. Changed testing dates; added ./ in front of ASCII, PCF, and runscripts. Updated runtime information. Updated format to comply with standards. 	Sec. 2.0 Secs. 3.3, 3.6, & 3.10 All
05/30/06	R4V4	626	<ul style="list-style-type: none"> Updated filenames. Added note about testing platforms. Updated script names and test case information. Updated test summary table. Added statements pertaining to different test cases on each platform. Updated test case information. Updated script names and test case information. Updated test summary table. Added statements pertaining to different test cases on each platform. Updated format to comply with standards. 	Sec. 2.1 Sec. 2.1 Sec. 3.2.1.1 Sec. 3.2.1.4 Secs. 3.2.2.2 & 3.2.2.3 Sec. 3.2.3 Sec. 3.3.1.1 Sec. 3.3.1.4 Secs. 3.3.2.2, 3.3.2.3, & 3.3.3 All
01/09/07	R4V5	664	<ul style="list-style-type: none"> Updated script names to match testing instructions. Document was converted from FrameMaker to Word. 	Secs. 3.2.1.1, 3.3.1.1, 3.6.1, 3.9.1, & 3.10.1 All
11/12/08	R5V1	692	<ul style="list-style-type: none"> Removed QC section of post processor 5.4P1. Deleted removal script information. Added note about library compilation. Updated paths to reflect new directory structure. Changed perl script names to C shell. Updated test case information. Added unlimit command. New charts of sarb directory structure. 	Secs. 1.2.5 & 3.9.2.2 Sec. 2.1 Sec. 2.2 Secs. 2.2.2, 2.2.4, 3.5.1.1, 3.5.2, 3.5.3, & 3.9 Secs. 3.5.1.1, 3.5.3, 3.9, & App. C Sec. 3.5.1.1, Table 3-3, Sec. 3.9.1.1, Table 3-5, Secs. 3.9.3 3.5.1.1, & 3.9.1.1 App. B

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
11/12/08 (Cont'd)	R5V1	692	<ul style="list-style-type: none"> Updated output comparison procedure for PGE 5.1P1. 	Secs. 3.5.2.4 & 3.5.2.6
1/22/08	R5V2	694	<ul style="list-style-type: none"> Updated paths to reflect new directory structure. Updated test case information. Added PROD environment variable and "unlimit" command. (02/05/2009) 	Secs. 2.2.1, 3.2, & 3.3 Secs. 3.2 & 3.3 Secs. 3.2 & 3.3
7/28/09	R5V3	718	<ul style="list-style-type: none"> Added description of PGE CER5.0P2. Updated tar file information. Added 5.0P2 to list of PGEs. Added compilation of 5.0P2. Added test cases for Terra and Aqua for PGE 5.0P2. 	Subsystem Overview (1.2.3) Sec. 2.1 Sec. 2.2 Sec. 2.2.2 Secs. 3.4 & 3.5
10/07/09	R5V4	728	<ul style="list-style-type: none"> Updated compilation instructions. Updated test case information. Updated directory structure. 	Secs. 2.2, 2.2.1, & 2.2.6 Sec. 3.12.1.1, Table 3-8, Sec. 3.12.3 Secs. 3.12.1 & 3.12.3
10/27/09	R5V5	733	<ul style="list-style-type: none"> Updated tar file name. Updated directory structure. Updated test case information. Updated comparison code information. Updated script names. 	Sec. 2.1 Secs. 2.2.4, 3.8.1.1, 3.8.2, & 3.8.3 Sec. 3.8.1.1, Table 3-6, & Sec. 3.8.3 Secs. 2.2.4 & 3.8.2.6 Secs. 3.8.2.3 & 3.8.2.4
07/25/12	R5V6	917	<ul style="list-style-type: none"> Updated compilation section for PGE CER5.0P2 delivery to <i>AMI</i>. Changed testing and evaluation procedures for CER5.0P2. Removed section for testing Aqua CER5.0P2. That information is now part of Section 3.4. Modified the "Introduction" paragraph. (12/03/2012) 	Sec. 2.2.2 Sec. 3.4 Sec. 3.5 Sec. 1.0

Document Revision Record

SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
07/25/12 (Cont'd)	R5V6	917	<ul style="list-style-type: none">• Formatting issues were fixed. (12/03/2012)• Long hyphens in commands were changed to short hyphens. (12/05/2012)	All Secs. 2.2.3 & 2.2.6

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1.0 Introduction

CERES is a key component of EOS and NPP. The first CERES instrument (PFM) flew on TRMM, four instruments are currently operating on the EOS Terra (FM1 and FM2) and Aqua (FM3 and FM4) platforms, and NPP (FM5) platform. CERES measures radiances in three broadband channels: a shortwave channel (0.3 - 5 μm), a total channel (0.3 - 200 μm), and an infrared window channel (8 - 12 μm). The last data processed from the PFM instrument aboard TRMM was March 2000; no additional data are expected. Until June 2005, one instrument on each EOS platform operated in a fixed azimuth scanning mode and the other operated in a rotating azimuth scanning mode; now all are typically operating in the fixed azimuth scanning mode. The NPP platform carries the FM5 instrument, which operates in the fixed azimuth scanning mode though it has the capability to operate in a rotating azimuth scanning mode.

CERES climate data records involve an unprecedented level of data fusion: CERES measurements are combined with imager data (e.g., MODIS on Terra and Aqua, VIIRS on NPP), 4-D weather assimilation data, microwave sea-ice observations, and measurements from five geostationary satellites to produce climate-quality radiative fluxes at the top-of-atmosphere, within the atmosphere and at the surface, together with the associated cloud and aerosol properties.

The CERES project management and implementation responsibility is at NASA Langley. The CERES Science Team is responsible for the instrument design and the derivation and validation of the scientific algorithms used to produce the data products distributed to the atmospheric sciences community. The CERES DMT is responsible for the development and maintenance of the software that implements the science team's algorithms in the production environment to produce CERES data products. The Langley ASDC is responsible for the production environment, data ingest, and the processing, archival, and distribution of the CERES data products.

1.1 Document Overview

This document, the CERES Release 4 Delivery Test Plan for the CERES Instantaneous Surface and Atmospheric Radiation Budget (SARB) Subsystem (Subsystem 5.0), is part of the CERES Subsystem 5.0 Release 4 delivery package provided to the Langley Atmospheric Science Data Center (ASDC). It provides a description of the CERES Instantaneous SARB Subsystem Release 2 software, and explains the procedures for installing, executing, and testing the software. A section is also included on validating the results of executing the software. A description of acronyms and abbreviations is provided in [Appendix A](#), a directory structure diagram is contained in [Appendix B](#), and a description of the software and data files is contained in [Appendix C](#).

The document is organized as follows:

Section [1.0](#) - Introduction

Section [2.0](#) - Software and Data File Installation Procedures

Section [3.0](#) - Test and Evaluation Procedures

[Appendix A](#) - Acronyms and Abbreviations

[Appendix B](#) - Directory Structure Diagrams

[Appendix C](#) - File Description Tables

1.2 Subsystem Overview

Two PGEs are currently required for the Instantaneous SARB Subsystem. PGE CER5.1P1 is the Main-Processor, which is run on an hourly basis. Prior to processing CER 5.1P1, the monthly pre-processor, CER5.0P1, must be executed. After CER5.0P1 has processed, CER5.1P1 processes for each hour of available data for the month.

1.2.1 CER5.0P1: CERES Instantaneous SARB Subsystem Surface Albedo and Daily MODIS Aerosol Monthly Pre-Processors

PGE CER5.0P1 executes two Instantaneous SARB Subsystem pre-processors: the Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor and the Daily MODIS Aerosol Monthly Pre-Processor.

The Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor produces a single monthly file containing a 10-minute map of surface albedo observations from clear-sky over land FOVs. Two versions of this map are produced. The first version, HMSAL, contains only data derived from the input SSFB files, thus leaving some areas with only default data. The second file, HMPSAL, fills in those areas for which no SSF data were available with data from a default data file. It is this second nonarchival file that is used as input by PGE CER5.1P1 for each hour of the month. An ASCII QC report is also produced.

The Instantaneous SARB Subsystem Daily MODIS Aerosol Monthly Pre-Processor produces a single monthly file, HMAER, of aerosol optical depth data based on the daily MOD08 or MYD08 data files produced from the MODIS instrument. In addition to merging these daily files into a single file for the month, the Aerosol Monthly Pre-Processor also fills in data gaps that may exist for a day over a given region by interpolating data for the same region from the closest days for which data are available.

1.2.2 CER5.0P2: CERES Instantaneous and Synoptic SARB Subsystem Surface Albedo Pre-Processor

PGE CER5.0P2 executes the Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor.

The Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor produces a single monthly file containing surface albedo. This file is used as input by PGE CER7.2.1P1 for each month. An ASCII QC report is also produced.

1.2.3 CER5.1P1: CERES Instantaneous SARB Subsystem Main-Processor

The Product Generation Executive (PGE) CER5.1P1 processes the CERES Instantaneous SARB Subsystem. This PGE consists of a Main-Processor and an Hierarchical Data Format (HDF) Post-Processor. The Instantaneous SARB Subsystem Main-Processor computes vertical longwave, shortwave, and window channel flux profiles that span from the surface to the top of the Earth's atmosphere for each Earth-viewing CERES Field-of-View (FOV). The primary output from the Main-Processor is the binary version of the Clouds and Radiative Swath (CRS)

product, the CRS-Binary (CRSB), which contains vertical flux profile data for all FOVs processed through the SARB Main-Processor. A smaller version of the CRSB which contains data only for FOVs that coincide with the CERES Validation Regions, the CRS Validation-Binary, is also produced. The CRSVB is used by members of the CERES Science Team located at Langley for quick evaluations of the data corresponding to other experiments. An ASCII Quality Control (QC) report is also produced with each run of the Subsystem.

The CRSB serves as input for CERES Subsystem 6.0, and as input to the Instantaneous SARB Subsystem HDF Post-Processor. The HDF Post-Processor reads the CRSB product and converts the data to an HDF format, thus generating the CRS archival product for distribution outside of NASA-Langley.

1.2.4 CER5.1P2: CERES Instantaneous SARB Subsystem Main-Processor

This is a version of CER5.1P1 intended for processing of Aqua data.

1.2.5 CER5.3P1: CERES Instantaneous SARB Subsystem Monthly Post-Processor

The PGE CER5.3P1, the Instantaneous SARB Subsystem HDF Post-Processor, converts an existing CRSB into a CRS, using an executable that is routinely executed with PGE CER5.1P1. This PGE is intended to be used on an as-needed basis only, as the CRSB is converted to HDF format routinely by PGE CER5.1P1. There is no source code or executable that is unique to CER5.3P1. The ASCII filename and PCF generators, and the runscript are unique to CER5.3P1.

1.2.6 CER5.4P1: CERES Instantaneous SARB Subsystem Monthly QC Processor

The PGE CER5.4P1, the Instantaneous SARB Subsystem Monthly QC Processor validates the HDF conversion process of CER5.1P1 by converting up to five hours of CRS files back to binary and comparing the results with the corresponding CRSB files already in existence. The ASCII filename and PCF generators, and the runscript are unique to CER5.4P1.

1.2.7 CER5.4P2: CERES Instantaneous SARB Subsystem Monthly QC Processor

This is a version of CER5.4P1 intended for processing of Aqua data.

2.0 Software and Data File Installation Procedures

This section describes how to install both the SARB library and the Subsystem 5.0 Instantaneous SARB software in preparation for making the necessary test runs at the Langley ASDC. The installation procedures include instructions for uncompressing and untarring the delivered files, properly defining environmental variables, and compiling the Instantaneous SARB programs.

2.1 Installation

Software/Data File Install Procedure:

1. The scripts, makefiles, and Process Control Files (PCF) in the Subsystem 5.0 delivery package expect the following environment variables, found in the `$CERESENV` script, to be defined:

PGSDIR	-	Directory for Toolkit libraries
CERESHOME	-	Top Directory for CERES Software
CERESLIB	-	Directory for CERESlib
PGSINC	-	Pointer to the PGS Include file directory
PGSLIB	-	Directory which contains the Toolkit library file
PGSMMSG	-	Directory which contains Toolkit and CERES Status Message Files
HDFDIR	-	Pointer to the HDF home directory

2. Change directory to the directory where you plan to install the SARB Subsystems. (The following instructions assume that the directory will be `$CERESHOME`.)
3. Uncompress and untar the SARB library and Instantaneous SARB Subsystem files:

Note: Please use the data tar files appropriate for the platform being tested.

```
uncompress InstSARB_data_R5-733.tar.Z
tar -xf InstSARB_data_R5-733.tar
uncompress InstSARB_src_R5-733.tar.Z
tar -xf InstSARB_src_R5-733.tar
```

2.2 Compilation

The status message files for all Instantaneous SARB PGEs are delivered in one directory. Software modules common to more than one PGE are contained in the SARB library. The instructions for compiling these portions of the subsystem follow. Instructions for generating the executable for PGE CER 5.0P1 are contained in Section 2.2.1, PGE CER5.0P2 in Section 2.2.2, PGE CER5.1P1 in Section 2.2.3, PGE CER5.1P2 in Section 2.2.4, PGE CER5.4P1 in Section 2.2.5, and for PGE CER5.4P2 in Section 2.2.6. Note that there are no compilation-related instructions for CER5.3P1.

1. The Status Message Files can be made by typing:

```
cd $CERESHOME/sarb/smf/sarb
./smfcompile_all.csh
```

2.2.1 Compiling PGE 5.0P1

1. The Subsystem 5.0 Monthly Pre-Processor (PGE CER5.0P1) includes two executables that are made by typing:

```
cd $CERESHOME/sarb/CER5.0P1/src/press5_monthly
./run_make clean
```

The resulting executable, **sfcalbhist_drv.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.0P1/bin**.

```
cd $CERESHOME/sarb/CER5.0P1/src/press5_modisaer
./run_make clean
```

The resulting executable, **modis_aer.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.0P1/bin**.

2. The PGE CER5.0P1 Comparison code executable, for use in evaluating the surface albedo history map test run results, can be made by typing:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_make clean
```

The resulting executable, **Monthly_SAH_Compare.exe**, remains in the directory **\$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly**.

3. The PGE CER5.0P1 Comparison code executable, for use in evaluating the monthly map of gridded daily MODIS aerosol data test run results, can be made by typing:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer
./run_make clean
```

The resulting executable, **gmod_compare.exe**, remains in the directory **\$CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer**.

2.2.2 Compiling PGE 5.0P2

Depending where compilation occurs, the executable will contain the platform type in the name. In this document, the variable `$CPUTYPE` will be either `ppc64` or `x86_64`.

NOTE: For full subsystem deliveries, use the following commands to compile all the software:

```
cd $CERESHOME/sarb/CER5.0P2/rcf
./compile-CER5.0P2.pl all
```

1. The PGE 5.0P2 Main-Processor executable can be made on both the *P6* and *x86* platforms by typing:

```
cd $CERESHOME/sarb/CER5.0P2/rcf
./compile-CER5.0P2.pl lib
```

```
cd $CERESHOME/sarb/CER5.0P2/rcf  
./compile-CER5.0P2.pl src
```

The resulting executable, **CER5.0P2_\$CPUTYPE**, is stored in the directory **\$CERESHOME/sarb/CER5.0P2/bin**.

2. Execute the following on either platform to compile the comparison software for the Main-Processor output:

```
cd $CERESHOME/sarb/CER5.0P2/rcf  
./compile-CER5.0P2.pl test
```

The resulting executable, **CER5.0P2Comp_\$CPUTYPE.exe**, remains in the directory **\$CERESHOME/sarb/CER5.0P2/test_suites**.

2.2.3 Compiling PGE 5.1P1

1. The SARB Library for PGE 5.1P1 and 5.4P1 is made by typing:

```
cd $CERESHOME/sarb/CER5.1P1/lib  
make -f Makefile.CRS
```

As this is a software library, no executable is generated. The message “Warning: creating SARBlib_CRS.a” appears at the end of successful compilation. The file, **SARBlib_CRS.a**, remains in the **\$CERESHOME/sarb/CER5.1P1/lib** directory.

2. The Subsystem 5.1 Main-Processor executable can be made by typing:

```
cd $CERESHOME/sarb/CER5.1P1/src/  
make
```

The resulting executable, **InstSARB_Drv.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.1P1/bin/**.

3. Execute the following to compile the comparison software for the Main-Processor output:

```
cd $CERESHOME/sarb/CER5.1P1/test_suites/  
make
```

The resulting executable, **crscomp.exe**, remains in the directory **\$CERESHOME/sarb/CER5.1P1/test_suites/**.

4. The HDF Post-Processor executable can be made by typing:

```
cd $CERESHOME/sarb/CER5.1P1/src/crs_hdf  
make
```

The resulting executable, **crs2hdf.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.1P1/bin**.

5. To compile the software to compare the HDF versions of the CRS file, enter the following at the command line:.

```
cd $CERESHOME/sarb/CER5.1P1/test_suites/crs_hdf
make
```

The Makefile compiles the provided C code and creates an executable, **hcmp**, that compares each Vdata and each SDS on the CRS HDF output file. This executable remains in the directory **\$CERESHOME/sarb/CER5.1P1/test_suites/crs_hdf**.

NOTE: Ignore any warning messages regarding variables that have been declared but never referenced. In no way do these warnings affect execution of the software.

2.2.4 Compiling PGE 5.1P2

1. The SARB Library for PGE 5.1P2 is made by typing:

```
cd $CERESHOME/sarb/CER5.1P2/lib
./run_make.CRS clean
```

As this is a software library, no executable is generated. The message “Warning: creating SARBlib_CRS.a” appears at the end of successful compilation. The file, **SARBlib_CRS.a**, remains in the **\$CERESHOME/sarb/CER5.1P2/lib** directory.

2. The Subsystem 5.1 Main-Processor executable can be made by typing:

```
cd $CERESHOME/sarb/CER5.1P2/src
./run_make clean
```

The resulting executable, **InstSARB_Drv_P2.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.1P2/bin**.

3. Execute the following to compile the comparison software for the Main-Processor output:

```
cd $CERESHOME/sarb/CER5.1P2/test_suites
./run_make clean
```

The resulting executable, **crscomp.exe**, remains in the directory **\$CERESHOME/sarb/CER5.1P2/test_suites**.

4. The HDF Post-Processor executable can be made by typing:

```
cd $CERESHOME/sarb/CER5.1P2/src/crs_hdf
./run_make clean
```

The resulting executable, **crs2hdf.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.1P2/bin**.

2.2.5 Compiling PGE 5.4P1

1. The Subsystem 5.4 Monthly QC Processor (PGE CER5.4P1) includes two executables that are made by typing:

```
cd $CERESHOME/sarb/CER5.4P1/src/hdf2crsb
make
```

The resulting executable, **hdf2crsb.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.4P1/bin**.

```
cd $CERESHOME/sarb/CER5.4P1/src/crsbcomp  
make
```

The resulting executable, **crsbcheck.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.4P1/bin**.

2.2.6 Compiling PGE 5.4P2

1. The Subsystem 5.4 Monthly QC Processor (PGE CER5.4P2) includes two executables that are made by typing:

```
cd $CERESHOME/sarb/CER5.4P2/lib  
make -f Makefile.CRS  
cd $CERESHOME/sarb/CER5.4P2/src/hdf2crsb  
make
```

The resulting executable, **hdf2crsb.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.4P2/bin**.

```
cd $CERESHOME/sarb/CER5.4P2/src/crsbcomp  
make
```

The resulting executable, **crsbcheck.exe**, is stored in the directory **\$CERESHOME/sarb/CER5.4P2/bin**.

3.0 Test and Evaluation Procedures

This section provides general information on how to execute the Subsystem 5.0 PGEs and provides an overview of the test and evaluation procedures. It includes a description of what is being tested and the order in which the tests should be performed.

3.1 PGE CER5.0P1--Monthly Pre-Processor for TRMM only

3.1.1 Stand Alone Test Procedures

3.1.1.1 PCF Generator

The SARB Surface Albedo Monthly Pre-Processor production script, run_press5, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. This PCF for the test case is created by first executing an ASCII file generator, ascii_gen_5.0P1, and then executing the PCF generator, pcfgen_5.0P1.

For production runs, the ASCII file generator, ascii_gen_5.0P1, must be executed to create the ASCII input file for a particular production run. The ASCII file generator requires one command line argument--the date parameter, formatted as YYYYMM, where YYYY is the 4-digit year and MM is the 2-digit month of the data. The PCF generator, pcfgen_5.0P1, is then executed using the newly created ASCII input file name as a command line argument.

1. Generate the ASCII input file for the TRMM test case:

```
cd $CERESHOME/sarb/bin/sarb
cp $CERESHOME/sarb/bin/sarb/ssit-monthly-env-TRMM.pl
  $CERESHOME/sarb/bin/sarb/ssit-monthly-env.pl
```

Set the Date and Instance variables:

```
setenv DATE 199805
setenv INSTANCE TRMM-PFM-VIRS_SSIT-Monthly_999999.199805
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/bin/sarb/ascii_gen_5.0P1.pl $DATE
```

The following file will be generated in \$CERESHOME/sarb/rcf/PCFgen/sarb:
CER5.0P1_PCFin_\$INSTANCE

2. Generate the PCF for the test case:

```
$CERESHOME/sarb/bin/sarb/pcfgen_5.0P1.pl CER5.0P1_PCFin_$INSTANCE
```

The following PCF will be generated in \$CERESHOME/sarb/rcf/pcf/sarb:
CER5.0P1_PCF_\$INSTANCE

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/rcf/pcf/sarb/CER5.0P1_PCF_$INSTANCE
    $CERESHOME/sarb/data/out_exp/data/sarb/CER5.0P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

3.1.1.2 Execution

Execute the production script by typing the script name, run_press5, followed by the name of the PCF generated by pcfgen_5.0P1.

```
cd $CERESHOME/sarb/bin/sarb
./run_press5.pl CER5.0P1_PCF_$INSTANCE
```

When the run script is executed upon the command line, a shell script is sourced in order to set the various environment variables for such runtime parameters as Sampling Strategy, Production Strategy, and Configuration Code.

For TRMM processing, six files will be created by the Monthly Pre-Processor:

```
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE.met
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANCE
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANCE.met
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTANCE
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTANCE.met
```

3.1.1.3 Exit Codes

All CER5.0P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for the executable.

3.1.1.4 Test Summary

While the sizes of the input files provided for this SSI&T test case are fairly representative of what may be expected in the production environment, it should be noted that the sizes of the input files can vary, thus varying the amount of required disk space.

Total Run Time:	TBD for TRMM data
Memory:	TBD for TRMM data
Required Disk Space:	TBD for TRMM data

3.1.2 Evaluation Procedures

3.1.2.1 Log and Status File Results

The Error and Status Log Files, CER5.0P1_LogReport_\$INSTANCE and CER5.0P1_LogStatus_\$INSTANCE are located in directory \$CERESHOME/sarb/data/runlogs/sarb after PGE CER5.0P1 has been executed.

3.1.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.0P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory `$CERESHOME/sarb/data/out_exp/data/sarb`, using the diff command:

```
cd $CERESHOME/sarb/data/ancillary/dynamic/sarb
diff CER_HMSAL_$INSTANCE.met
    $CERESHOME/sarb/data/out_exp/data/sarb/CER_HMSAL_$INSTANCE.met

diff CER_HMPSAL_$INSTANCE.met
    $CERESHOME/sarb/data/out_exp/data/sarb/CER_HMPSAL_$INSTANCE.met

cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
diff CER_MQCSA_$INSTANCE.met
    $CERESHOME/sarb/data/out_exp/data/sarb/CER_MQCSA_$INSTANCE.met
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.1.2.3 Execution of Comparison Software for PGE CER5.0P1

This section provides information on how to compile and execute the comparison software for PGE CER5.0P1, the Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor.

1. Execute the following to run comparison software for PGE CER5.0P1 surface albedo history output:

```
cd $CERESHOME/sarb/test_suites/sarb/src/press5_monthly
./run_msah_compare CER_HMSAL_$INSTANCE
```

NOTE: The script `run_msah_compare` removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/test_suites/sarb/src/press5_monthly/CER_HMSAL_$INST
ANCE\_test_suites_results
```

2. Repeat the execution of the comparison software for another file produced by the monthly pre-processor:

```
./run_msah_compare CER_HMPSAL_$INSTANCE
```

NOTE: The script `run_msah_compare` removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/test_suites/sarb/src/press5_monthly/CER_HMPSAL_$INSTAN  
TANCE\_test_suites_results
```

3. Compare the Quality Control Report against the expected output:

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb  
diff CER_MQCSA_$INSTANCE  
$CERESHOME/sarb/data/out_exp/data/sarb/CER_MQCSA_$INSTANCE
```

The only differences should be in the Processing Date information in the Quality Control Report Header.

3.1.2.4 Evaluation of PGE CER5.0P1 Comparison Software Output

This section provides the procedure for evaluating the output from PGE CER5.0P1.

1. Examine the comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/test_suites/sarb/src/press5_monthly/CER_HMSAL_$INSTAN  
CE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Steps 2 and 3.

2. Examine the second comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/test_suites/sarb/src/press5_monthly/CER_HMPSAL_$INSTAN  
CE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 3.

3. E-mail the file
\$CERESHOME/sarb/test_suites/sarb/src/press5_monthly/CER_HMSAL_\$INSTANCE_test_suites_results and
\$CERESHOME/sarb/test_suites/sarb/press5_monthly/CER_HMPSAL_\$INSTANCE_test_suites_results to ceresdmt+sarb@larc.nasa.gov

3.1.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/bin/sarb  
cp $CERESHOME/sarb/bin/sarb/ssit-monthly-env-TRMM.pl  
  $CERESHOME/sarb/bin/sarb/ssit-monthly-env.pl  
./rm_script_5.0P1.pl CER5.0P1_PCF_$INSTANCE
```

2. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.2 PGE CER5.0P1--Monthly Pre-Processor for Terra

3.2.1 Stand Alone Test Procedures

3.2.1.1 PCF Generator

The SARB Surface Albedo Monthly Pre-Processor production script, `run_press5.pl`, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. This PCF for the test case is created by first executing an ASCII file generator, `ascii_gen_5.0P1.pl`, and then executing the PCF generator, `pcfgen_5.0P1.pl`.

For production runs, the ASCII file generator, `ascii_gen_5.0P1.pl`, must be executed to create the ASCII input file for a particular production run. The ASCII file generator requires one command line argument--the date parameter, formatted as YYYYMM, where YYYY is the 4-digit year and MM is the 2-digit month of the data. The PCF generator, `pcfgen_5.0P1.pl`, is then executed using the newly created ASCII input file name as a command line argument.

1. Move the SSFB and MOA input files to the appropriate input directories by typing:

```
cd $CERESHOME/sarb/data/input/sarb
./sarb_datamove_200707.csh
```

Warning messages may state that the files cannot be created because they already exist. These messages can be ignored.

2. Generate the ASCII input file for the Terra test case:

```
cd $CERESHOME/sarb/CER5.0P1/rcf
```

For FM1:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Terra-FM1.pl
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl
setenv DATE 200707
setenv INSTANCE Terra-FM1-MODIS_Edition2F_999999.200707
```

For FM2:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Terra-FM2.pl
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl
setenv DATE 200707
setenv INSTANCE Terra-FM2-MODIS_Edition2F_999999.200707
```

Specify non-production testing:

```
setenv PROD no
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.0P1/rcf/ascii_gen_5.0P1.pl $DATE
```

The following file will be generated in **\$CERESHOME/sarb/CER5.0P1/rcf/pcf:**
CER5.0P1_PCFin_\$INSTANCE

3. Generate the PCF for the test case:

```
$CERESHOME/sarb/CER5.0P1/rcf/pcfgen_5.0P1.pl  
CER5.0P1_PCFin_$INSTANCE
```

The following PCF will be generated in **\$CERESHOME/sarb/CER5.0P1/rcf/pcf:**
CER5.0P1_PCF_\$INSTANCE

4. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.0P1/rcf/pcf/CER5.0P1_PCF_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.0P1/CER5.0P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

3.2.1.2 Execution

Execute the production script by typing the script name, run_press5.pl, followed by the name of the PCF generated by pcfgen_5.0P1.pl.

Remove default limits on available memory:

```
unlimit
```

```
cd $CERESHOME/sarb/CER5.0P1/rcf  
./run_press5.pl CER5.0P1_PCF_$INSTANCE
```

When the run script is executed upon the command line, a shell script is sourced in order to set the various environment variables for such runtime parameters as Sampling Strategy, Production Strategy, and Configuration Code.

Eight files will be created by the Monthly Pre-Processor:

```
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE.met  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANCE  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANCE.met  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMAER_$INSTANCE  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMAER_$INSTANCE.met  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTANCE  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTANCE.  
met
```

3.2.1.3 Exit Codes

All CER5.0P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for the executable.

3.2.1.4 Test Summary

While the sizes of the input files provided for this SSI&T test case are fairly representative of what may be expected in the production environment, it should be noted that the sizes of the input files can vary, thus varying the amount of required disk space. Please note that the run time for this test is not typical for this PGE. Typical run times are on the order of 3 or 4 hours.

Table 3-1. Test Summary for PGE 5.0P1

	Warlock		Linux Cluster	
	FM1	FM2	FM1	FM2
Run Time	5:26 hours	4:42 hours	1:38 hours	1:51 hours
Memory	35448 K	35448 K	35448 K	35448 K
Required Disk Space	167971.53 MB	167971.53 MB	167971.53 MB	167971.53 MB

3.2.2 Evaluation Procedures

3.2.2.1 Log and Status File Results

The Error and Status Log Files, **CER5.0P1_LogReport_\$INSTANCE** and **CER5.0P1_LogStatus_\$INSTANCE** are located in directory **\$CERESHOME/sarb/runlogs/** after PGE CER5.0P1 has been executed.

3.2.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.0P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory **\$CERESHOME/sarb/data_exp/CER5.0P1**, using the diff command:

```
cd $CERESHOME/sarb/data/ancillary/dynamic/sarb
```

For FM1:

```
diff CER_HMSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMSAL_$INSTANCE.met
```

```
diff CER_HMPSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMPSAL_$INSTANCE.met
```

```
diff CER_HMAER_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMAER_$INSTANCE.met
```

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
diff CER_MQCSA_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE.met
```

For FM2:

```
diff CER_HMSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMSAL_$INSTANCE.met
```

```
diff CER_HMPSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMPSAL_$INSTANCE.met
```

```
diff CER_HMAER_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMAER_$INSTANCE.met
```

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
diff CER_MQCSA_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE.met
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.2.2.3 Execution of Comparison Software for PGE CER5.0P1

This section provides information on how to compile and execute the comparison software for PGE CER5.0P1, the Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor.

1. Execute the following to run comparison software for PGE CER5.0P1 output:

For FM1:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMSAL_$INSTANCE
```

For FM2:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMSAL_$INSTANCE
```

NOTE: The script run_msah_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_$IN
STANCE\_test_suites_results
```

2. Repeat the execution of the comparison software for another file produced by the monthly pre-processor:

For FM1:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMPSAL_$INSTANCE
```

For FM2:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMPSAL_$INSTANCE
```

NOTE: The script run_msah_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMPSAL_$IN
STANCE\_test_suites_results
```

3. Execute the following to run comparison software for PGE CER5.0P1 aerosol history output:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer
./run_gmod_compare CER_HMAER_$INSTANCE
```

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer/CompareResults_C
ER_HMAER_$INSTANCE
```

4. Compare the Quality Control Report against the expected output:

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
```

For FM1:

```
diff CER_MQCSA_$INSTANCE
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE
```

For FM2:

```
diff CER_MQCSA_$INSTANCE
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE
```

The only differences should be in the Processing Date information in the Quality Control Report Header.

3.2.2.4 Evaluation of PGE CER5.0P1 Comparison Software Output

This section provides the procedure for evaluating the output from PGE CER5.0P1.

1. Examine the comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_$I
NSTANCE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Steps 2, 3, and 4.

2. Examine the second comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMPSAL_
$INSTANCE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Steps 3 and 4.

3. Examine the third comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer/CompareResults
_CER_HMAER_$INSTANCE
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 4.

4. E-mail the file

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_$INST
ANCE\_test_suites_results and $CERESHOME/sarb/CER5.0P1/test_suites/
press5_monthly/CER_HMPSAL_$INSTANCE\_test_suites_results to
Thomas.E.Caldwell@nasa.gov.
```

3.2.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.0P1/rcf
```

For FM1:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Terra-FM1.pl  
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl  
setenv INSTANCE Terra-FM1-MODIS_Edition2F_999999.200707
```

For FM2:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Terra-FM2.pl  
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl  
setenv INSTANCE Terra-FM2-MODIS_Edition2F_999999.200707
```

```
./rm_script_5.0P1.pl CER5.0P1_PCF_$INSTANCE
```

2. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.3 PGE CER5.0P1--Monthly Pre-Processor for Aqua

3.3.1 Stand Alone Test Procedures

3.3.1.1 PCF Generator

The SARB Surface Albedo Monthly Pre-Processor production script, run_press5.pl, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. This PCF for the test case is created by first executing an ASCII file generator, ascii_gen_5.0P1.pl, and then executing the PCF generator, pcfgen_5.0P1.pl.

For production runs, the ASCII file generator, ascii_gen_5.0P1.pl, must be executed to create the ASCII input file for a particular production run. The ASCII file generator requires one command line argument--the date parameter, formatted as YYYYMM, where YYYY is the 4-digit year and MM is the 2-digit month of the data. The PCF generator, pcfgen_5.0P1.pl, is then executed using the newly created ASCII input file name as a command line argument.

1. Link the SSFB, MOA, and MODIS input files to the appropriate input directories by typing:

```
cd $CERESHOME/sarb/data/input/sarb
./sarb_datamove_200707.csh
```

Warning messages may state that the files cannot be created because they already exist. These messages can be ignored.

2. Generate the ASCII input file for the Aqua test case:

```
cd $CERESHOME/sarb/CER5.0P1/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Aqua-FM3.pl
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl
setenv DATE 200707
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.200707
```

For FM4:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Aqua-FM4.pl
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl
setenv DATE 200707
setenv INSTANCE Aqua-FM4-MODIS_Edition2C_999999.200707
```

Specify non-production testing:

```
setenv PROD no
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.0P1/rcf/ascii_gen_5.0P1.pl $DATE
```

The following file will be generated in **\$CERESHOME/sarb/CER5.0P1/rcf/pcf:**
CER5.0P1_PCFin_\$INSTANCE

3. Generate the PCF for the test case:

```
$CERESHOME/sarb/CER5.0P1/rcf/pcfgen_5.0P1.pl  
CER5.0P1_PCFin_$INSTANCE
```

The following PCF will be generated in **\$CERESHOME/sarb/CER5.0P1/rcf/pcf:**
CER5.0P1_PCF_\$INSTANCE

4. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.0P1/rcf/pcf/CER5.0P1_PCF_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.0P1/CER5.0P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

3.3.1.2 Execution

Execute the production script by typing the script name, run_press5, followed by the name of the PCF generated by pcfgen_5.0P1.pl.

Remove default limits on available memory:

```
unlimit
```

```
cd $CERESHOME/sarb/CER5.0P1/rcf  
./run_press5.pl CER5.0P1_PCF_$INSTANCE
```

When the run script is executed upon the command line, a shell script is sourced in order to set the various environment variables for such runtime parameters as Sampling Strategy, Production Strategy, and Configuration Code.

Eight files will be created by the Monthly Pre-Processor:

```
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMSAL_$INSTANCE.  
met  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANC  
E  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMPSAL_$INSTANC  
E.met  
$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMAER_$INSTANCE
```

```

$CERESHOME/sarb/data/ancillary/dynamic/sarb/CER_HMAER_$INSTANCE
.met
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTAN
CE
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_MQCSA_$INSTAN
CE.met

```

3.3.1.3 Exit Codes

All CER5.0P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for the executable.

3.3.1.4 Test Summary

While the sizes of the input files provided for this SSI&T test case are fairly representative of what may be expected in the production environment, it should be noted that the sizes of the input files can vary, thus varying the amount of required disk space.

Table 3-2. Test Summary for PGE 5.0P1

	Warlock		Linux Cluster	
	FM3	FM4	FM3	FM4
Run Time	4:03 hours	4:21 hours	1:25 hours	1:27 hours
Memory	36672 k	35448 k	35448 k	35448 k
Required Disk Space	93.97 GB	93.97 GB	93.97 GB	93.97 GB

3.3.2 Evaluation Procedures

3.3.2.1 Log and Status File Results

The Error and Status Log Files, CER5.0P1_LogReport_\$INSTANCE and CER5.0P1_LogStatus_\$INSTANCE are located in directory \$CERESHOME/sarb/runlogs/ after PGE CER5.0P1 has been executed.

3.3.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.0P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory \$CERESHOME/sarb/data_exp/CER5.0P1, using the diff command:

```
cd $CERESHOME/sarb/data/ancillary/dynamic/sarb
```

For FM3:

```
diff CER_HMSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMSAL_$INSTANCE.met
```

```
diff CER_HMPSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMPSAL_$INSTANCE.met
```

```
diff CER_HMAER_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMAER_$INSTANCE.met
```

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
diff CER_MQCSA_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE.met
```

For FM4:

```
diff CER_HMSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMSAL_$INSTANCE.met
```

```
diff CER_HMPSAL_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMPSAL_$INSTANCE.met
```

```
diff CER_HMAER_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_HMAER_$INSTANCE.met
```

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
diff CER_MQCSA_$INSTANCE.met
    $CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE.met
```

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

3.3.2.3 Execution of Comparison Software for PGE CER5.0P1

This section provides information on how to compile and execute the comparison software for PGE CER5.0P1, the Instantaneous SARB Subsystem Surface Albedo Monthly Pre-Processor.

1. Execute the following to run comparison software for PGE CER5.0P1 output:

For FM3:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMSAL_$INSTANCE
```

For FM4:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly
./run_msah_compare CER_HMSAL_$INSTANCE
```

NOTE: The script run_msah_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_$INSTANCE\_test_suites_results
```

2. Repeat the execution of the comparison software for another file produced by the monthly pre-processor:

For FM3:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly  
./run_msah_compare CER_HMPSAL_$INSTANCE
```

For FM4:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly  
./run_msah_compare CER_HMPSAL_$INSTANCE
```

NOTE: The script run_msah_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMPSAL_$INSTANCE\_test_suites_results
```

3. Execute the following to run comparison software for PGE CER5.0P1 aerosol history output:

```
cd $CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer  
./run_gmod_compare CER_HMAER_$INSTANCE
```

One file will be created:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer/CompareResults_CER_HMAER_$INSTANCE
```

4. Compare the Quality Control Report against the expected output:

```
cd $CERESHOME/sarb/data/out_comp/qa_reports/sarb
```

For FM3:

```
diff CER_MQCSA_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE
```

For FM4:

```
diff CER_MQCSA_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.0P1/CER_MQCSA_$INSTANCE
```

The only differences should be in the Processing Date information in the Quality Control Report Header.

3.3.2.4 Evaluation of PGE CER5.0P1 Comparison Software Output

This section provides the procedure for evaluating the output from PGE CER5.0P1.

1. Examine the comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_  
$INSTANCE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Steps 2, 3, and 4.

2. Examine the second comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMPSAL_  
$INSTANCE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Steps 3 and 4.

3. Examine the third comparison report file for the Monthly Pre-Processor:

more

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_modisaer/CompareResults  
_CER_HMAER_$INSTANCE
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 4.

4. E-mail the file:

```
$CERESHOME/sarb/CER5.0P1/test_suites/press5_monthly/CER_HMSAL_  
$INSTANCE\_test_suites_results and $CERESHOME/sarb/CER5.0P1/test_suites/  
press5_monthly/CER_HMPSAL_$INSTANCE\_test_suites_results to  
Thomas.E.Caldwell@nasa.gov.
```

3.3.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.0P1/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Aqua-FM3.pl  
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl  
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.200707
```

For FM4:

```
cp $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env-Aqua-FM4.pl  
  $CERESHOME/sarb/CER5.0P1/rcf/ssit-monthly-env.pl  
setenv INSTANCE Aqua-FM4-MODIS_Edition2C_999999.200707
```

```
./rm_script_5.0P1.pl CER5.0P1_PCF_$INSTANCE
```

2. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.4 PGE CER5.0P2--Monthly Pre-Processor for Terra

3.4.1 Stand-alone Test Procedures for *P6* and *x86* platforms

3.4.1.1 Execution

CER5.0P2: Terra-FM1

Command Line Instructions:

unlimit

setenv PROD no (read input locally)

cd \$CERESHOME/sarb/CER5.0P2/rcf

source sarb-5.0P2-FM1-env.csh

**cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-
MODIS_Edition3_999999.200207**

cd \$CERESHOME/sarb/CER5.0P2/rcf

CER5.0P2_pcfgen.pl -date 200207

run-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-MODIS_Edition3_999999.200207

SGE Testing Instructions:

setenv PROD no (read input locally)

cd \$CERESHOME/sarb/CER5.0P2/rcf

source sarb-5.0P2-FM1-env.csh

**cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-
MODIS_Edition3_999999.200207**

**cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-
MODIS_Edition3_999999.200207**

cd \$CERESHOME/sarb/CER5.0P2/rcf

CER5.0P2-SGE_Driver.pl -date 200207

Exit Codes

0 - Normal Exit,

200 - Fatal Error.

CER5.0P2: Terra-FM2

Command Line Instructions:

unlimit

setenv PROD no (read input locally)

cd \$CERESHOME/sarb/CER5.0P2/rcf

source sarb-5.0P2-FM2-env.csh

**cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM2-
MODIS_Edition3_999999.200207**

```
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2_pcfgen.pl -date 200207
run-CER5.0P2.pl CER5.0P2_PCF_Terra-FM2-MODIS_Edition3_999999.200207
```

SGE Testing Instructions:

```
setenv PROD no (read input locally)
cd $CERESHOME/sarb/CER5.0P2/rcf
source sarb-5.0P2-FM2-env.csh
cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM2-
  MODIS_Edition3_999999.200207
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2-SGE_Driver.pl -date 200207
```

Exit Codes

0 - Normal Exit,
200 - Fatal Error.

CER5.0P2: Aqua-FM3

Command Line Instructions:

```
unlimit
setenv PROD no (read input locally)
cd $CERESHOME/sarb/CER5.0P2/rcf
source sarb-5.0P2-FM3-env.csh
cleanup-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM3-
  MODIS_Edition3_999999.200207
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2_pcfgen.pl -date 200207
run-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM3-MODIS_Edition3_999999.200207
```

SGE Testing Instructions:

```
setenv PROD no (read input locally)
cd $CERESHOME/sarb/CER5.0P2/rcf
source sarb-5.0P2-FM3-env.csh
cleanup-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM3-
  MODIS_Edition3_999999.200207
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2-SGE_Driver.pl -date 200207
```

Exit Codes

0 - Normal Exit,
200 - Fatal Error.

CER5.0P2: Aqua-FM4**Command Line Instructions:****unlimit**

```
setenv PROD no (read input locally)
cd $CERESHOME/sarb/CER5.0P2/rcf
source sarb-5.0P2-FM4-env.csh
cleanup-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM4-
  MODIS_Edition3_999999.200207
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2_pcfgen.pl -date 200207
run-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM4-MODIS_Edition3_999999.200207
```

SGE Testing Instructions:

```
setenv PROD no (read input locally)
cd $CERESHOME/sarb/CER5.0P2/rcf
source sarb-5.0P2-FM4-env.csh
cleanup-CER5.0P2.pl CER5.0P2_PCF_Aqua-FM4-
  MODIS_Edition3_999999.200207
cd $CERESHOME/sarb/CER5.0P2/rcf
CER5.0P2-SGE_Driver.pl -date 200207
```

Exit Codes

0 - Normal Exit,
200 - Fatal Error.

3.4.1.2 Test Summary**CER5.0P2: Edition2**

Total Run Time: 3 min

3.4.2 Evaluation Procedures

This section provides information on how to execute the comparison software for the SARB Subsystem PGE CER5.0P2.

CER5.0P2: Terra-FM1

To compare the created output data:

```
unlimit  
cd $CERESHOME/sarb/CER5.0P2/rcf  
source sarb-5.0P2-FM1-env.csh  
cd $CERESHOME/sarb/CER5.0P2/test_suites  
compare_CER5.0P2_files.pl
```

CER5.0P2: Terra-FM2

To compare the created output data:

```
unlimit  
cd $CERESHOME/sarb/CER5.0P2/rcf  
source sarb-5.0P2-FM2-env.csh  
cd $CERESHOME/sarb/CER5.0P2/test_suites  
compare_CER5.0P2_files.pl
```

CER5.0P2: Aqua-FM3

To compare the created output data:

```
unlimit  
cd $CERESHOME/sarb/CER5.0P2/rcf  
source sarb-5.0P2-FM3-env.csh  
cd $CERESHOME/sarb/CER5.0P2/test_suites  
compare_CER5.0P2_files.pl
```

CER5.0P2: Aqua-FM4

To compare the created output data:

```
unlimit  
cd $CERESHOME/sarb/CER5.0P2/rcf  
source sarb-5.0P2-FM4-env.csh  
cd $CERESHOME/sarb/CER5.0P2/test_suites  
compare_CER5.0P2_files.pl
```

3.4.2.1 Log and Status File Results

There are five Log files associated with this PGE. The first three listed below are required by the Toolkit. The Toolkit Log files contain all error and/or status messages produced by the PGE during processing.

1. Report Log File:
\$CERESHOME/sarb/runlogs/CER5.0P2/CER5.0P2_LogReport_\$\$\$5_\$PS5_\$CC5.200207
 The Report Log File contain RegridMOA-related informational messages. These messages may be strictly informative (Error Type = Status or Warning) or may indicate a fatal condition that results in premature PGE termination (Error Type = Fatal).
2. Status Log File:
\$CERESHOME/sarb/runlogs/CER5.0P2/CER5.0P2_LogStatus_\$\$\$5_\$PS5_\$CC5.200207
 The Status Log File contains all messages created by the Toolkit and RegridMOA-related messages that can lead to abnormal ending of the Preprocessor. If an abnormal exit is encountered by the PGE, this file should be examined for '_E_', (error) or '_F_' (fatal) message types.
3. User Log File:
\$CERESHOME/sarb/runlogs/CER5.0P2/CER5.0P2_LogUser_\$\$\$5_\$PS5_\$CC5.200207
 The User Log File is not used at this time, but exists to satisfy the Toolkit requirements. Typically the _U_ and _N_ (User information and Notice) will be written to User Log File and Status Log File.
4. PCF Log File:
\$CERESHOME/sarb/CER5.0P2/rcf/pcf/CER5.0P2_PCF_\$\$\$5_\$PS5_\$CC5.200207.log

This log file is created when the PCF is generated and contains a listing of all the environment variables set when the PCF was created along with a listing of all the files used to create this PCF. There is also a listing of any missing optional and mandatory files. The list of existing output data files will only be created if the PGE is run more than once without clean-up.

3.4.2.2 Metadata Evaluation

TBD

3.4.2.3 Evaluation of Comparison Software Output

All comparisons done in Section 3.4.1.1 by the test script should look like the following:

Comparing files:

```
CER_SAH_$$$5_Edition3A_300301.200207
CER_SAH_$$$5_$PS5_$CC5.200207
SUCCESSFUL
```

If an error in a file comparison is found the following message will be displayed:

Comparing files:

```
CER_SAH_$$$5_Edition3A_300301.200207
CER_SAH_$$$5_$PS5_$CC5.200207
ERROR: Check comparison file
```

The comparison file will be here:

```
{$CERESHOME}/sarb/CER5.0P2/test_suites  
CER_SAH_$SS5_$PS5_$CC5.200207.compare
```

3.4.3 Solutions to Possible Problems

All SARB data should be deleted before rerunning any of the above tests. This can be done by using the following commands:

```
cd $CERESHOME/sarb/CER5.0P2/rcf
```

Then depending on which test case you want to delete:

```
source sarb-5.0P2-env.csh  
cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-  
MODIS_Edition3_999999.200207  
source sarb-5.0P2-env.csh  
cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-  
MODIS_Edition3_999999.200207  
source sarb-5.0P2-env.csh  
cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-  
MODIS_Edition3_999999.200207  
source sarb-5.0P2-env.csh  
cleanup-CER5.0P2.pl CER5.0P2_PCF_Terra-FM1-  
MODIS_Edition3_999999.200207
```

3.5 PGE CER5.1P1--Main-Processor TRMM Test Case

3.5.1 Stand Alone Test Procedures

The Main-Processor production script, runsarb, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.1P1, and then executing the PCF generator, pcfgen_5.1P1.

In the production environment, ascii_gen_5.1P1 and pcfgen_5.1P1 must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.1P1, requires one command line argument--the date parameter, formatted as YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data. The PCF generator, pcfgen_5.1P1, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, runsarb, followed by the name of the PCF generated by pcfgen_5.1P1.

3.5.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/bin/sarb
cp $CERESHOME/sarb/bin/sarb/ssit-main-env-TRMM.pl
$CERESHOME/sarb/bin/sarb/ssit-main-env.pl
```

Set the Date and Instance variables:

```
setenv DATE 1998050100
setenv INSTANCE TRMM-PFM-VIRS_SSIT_999999.1998050100
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/bin/sarb/ascii_gen_5.1P1.pl $DATE
```

The following file will be generated in **\$CERESHOME/sarb/rcf/PCFgen/sarb:**

```
CER5.1P1_PCFin_$INSTANCE
```

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/bin/sarb
$CERESHOME/sarb/bin/sarb/pcfgen_5.1P1.pl CER5.1P1_PCFin_$INSTANCE
```

The following PCF will be generated in **\$CERESHOME/sarb/rcf/pcf/sarb:**

```
CER5.1P1_PCF_$INSTANCE
```

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/rcf/pcf/sarb/CER5.1P1_PCF_$INSTANCE
$CERESHOME/sarb/data/out_exp/data/sarb/CER5.1P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Copy the SSFA input files provided with this delivery to the directories to which the PCF is pointing by typing:

```
cd $CERESHOME/sarb/data/input/sarb
./CER5.1P1_InputFileMover.csh copyfiles
```

5. Execute the Full-Hour Mode test case by typing:

```
cd $CERESHOME/sarb/bin/sarb
./runsarb.pl CER5.1P1_PCF_$INSTANCE
```

Six files will be created by the Main-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE.met
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE.met
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE
.met
```

Two files will be created by the HDF Post-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
```

3.5.1.1.1 Exit Codes

All CER5.1P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.5.1.1.2 Test Summary

Total Run Time:	TBD for TRMM data
Memory:	TBD for TRMM data
Required Disk Space:	TBD for TRMM data

3.5.1.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.1P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory **\$CERESHOME/sarb/data/out_exp/data/sarb**, using the diff command.

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

```
diff
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE.me
t $CERESHOME/sarb/data/out_exp/data/sarb/CER_CRSB_$INSTANCE.met
```

```
diff
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE.m
et
$CERESHOME/sarb/data/out_exp/data/sarb/CER_CRSVB_$INSTANCE.met
```

```
diff $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
$CERESHOME/sarb/data/out_exp/data/sarb/CER_CRS_$INSTANCE.met
```

```
diff
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTAN
CE.met
$CERESHOME/sarb/data/out_exp/data/sarb/CER_HQCR_$INSTANCE.met
```

3.5.1.3 Execution of Comparison Software for the Main-Processor

This section provides information on how to compile and execute the comparison software for the Instantaneous SARB Subsystem 5.1.

1. Execute the following to compare the binary output from the Main-Processor Full-Hour Mode test case. Note that this software does not compare the HDF version of the CRS.

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5
./run_crsb_compare CER_CRSB_$INSTANCE
```

One file will be created:

```
$CERESHOME/sarb/test_suites/sarb/src/mainss5/CER_CRSB_$INSTANCE\tes
t_suites_results
```

NOTE: The message “lib-4961 : WARNING” is repeated many times during the execution of this code. The cause is currently unknown. The results do not appear to be affected, however.

NOTE: The script run_crsb_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

2. Compare the Quality Control Report for the Mode against the expected output:

First, try to remove old output files IF they exist:

```
cd $CERESHOME/sarb/data/out_exp/data/sarb
rm CER5.1P1_MainQC_FullHour_diff
```

diff

```
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_${INSTAN
CE}$CERESHOME/sarb/data/out_exp/data/sarb/CER_HQCR_${INSTANCE} >
$CERESHOME/sarb/data/out_exp/data/sarb/CER5.1P1_MainQC_FullHour_d
iff
```

The only differences should be in the Processing Date information in the Quality Control Report Header. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm.

3.5.1.4 Execution of Comparison Software for the HDF Post-Processor

Execute comparison software for the test case

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf
./run_crshdf_compare CER_CRS_${INSTANCE} > CER5.1P1_FullOut
```

3.5.1.5 Evaluation of Main-Processor Comparison Software Output

This section provides the procedure for evaluating the output from the Instantaneous SARB Subsystem 5.1.

1. Examine the comparison report files for the Main-Processor:

more

```
$CERESHOME/sarb/test_suites/sarb/src/mainss5/CER_CRSB_${INSTANCE}\_
test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 2.

2. E-mail the files:

```
$CERESHOME/sarb/test_suites/sarb/mainss5/CER_CRSB_${INSTANCE}.Diag and
$CERESHOME/sarb/data/out_exp/sarb/CER5.1P1_MainQC_FullHour_diff to
ceresdmt+sarb@larc.nasa.gov.
```

3.5.1.6 Evaluation of the CRS HDF Product

1. During the executions of the HDF Post-Processor, if the SDS data or Vdata field data on the newly created HDF file,

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_${INSTANCE} matches
the data on the provided CRS HDF file of the same name on
$CERESHOME/sarb/data/out_exp/data/sarb, 'OK.' is appended to the end of the
output line as follows:
```

```
Comparing SDS "....." data... OK.
or
Comparing Vfield "....." data... OK.
```

The only differences between the two HDF output files should be the dates on Vfields: “CRS_DATE” on the “CRS_Header_Vdata” Vdata and “CERPRODUCTIONDATETIME” on the “CERES_metadata” Vdata. If CERESLIB has changed, the date may be different in the “LOCALVERSIONID” on the “CERES_metadata” Vdata. Another possible acceptable difference is in the “INST_SARBVER” Vdata.

To examine the output produced by the HDF Post-Processor for the Full-Hour Mode, type

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf  
more CER5.1P1_FullOut
```

3.5.2 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/bin/sarb
```

For the Full-Hour Mode test case:

```
cp $CERESHOME/sarb/bin/sarb/ssit-main-env-TRMM.pl  
$CERESHOME/sarb/bin/sarb/ssit-main-env.pl  
./rm_script_5.1P1.pl CER5.1P1_PCF_$INSTANCE
```

2. Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.
3. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.6 PGE CER5.1P1--Main-Processor Terra Test Case

3.6.1 Stand Alone Test Procedures

The Main-Processor production script, runsarb, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.1P1, and then executing the PCF generator, pcfgen_5.1P1.

In the production environment, ascii_gen_5.1P1 and pcfgen_5.1P1 must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.1P1, requires one command line argument--the date parameter, formatted as YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data. The PCF generator, pcfgen_5.1P1, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, runsarb, followed by the name of the PCF generated by pcfgen_5.1P1.

Since the Main-Processor can execute in two different modes, as discussed in Section 1.2.2, a test case for each mode is provided.

3.6.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/CER5.1P1/rcf
```

For FM1:

```
source ssit-main-env-Terra-FM1.csh  
setenv DATE 2006050100  
setenv INSTANCE Terra-FM1-MODIS_Edition2B_999999.2006050100
```

For FM2:

```
source ssit-main-env-Terra-FM2.csh  
setenv DATE 2006050100  
setenv INSTANCE Terra-FM2-MODIS_Edition2B_999999.2006050100
```

Remove any existing output files:

```
$CERESHOME/sarb/CER5.1P1/rcf//rm_script_5.1P1  
CER5.1P1_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.1P1/rcf/ascii_gen_5.1P1 $DATE
```

The following file will be generated in **\$CERESHOME/sarb/CER5.1P1/rcf/pcf:**
CER5.1P1_PCFin_\$INSTANCE

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/CER5.1P1/rcf  
$CERESHOME/sarb/CER5.1P1/rcf/pcfgen_5.1P1  
CER5.1P1_PCFin_$INSTANCE
```

The following PCF will be generated in **\$CERESHOME/sarb/CER5.1P1/rcf/pcf/:**
CER5.1P1_PCF_\$INSTANCE

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.1P1/rcf/pcf/CER5.1P1_PCF_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.1P1/CER5.1P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Copy the SSFA input files provided with this delivery to the directories to which the PCF is pointing by typing:

```
cd $CERESHOME/sarb/data/input/sarb  
./CER5.1P1_InputFileMover.csh copyfiles
```

5. Remove default limits on available memory:

```
unlimit
```

6. Execute the Full-Hour Mode test case by typing:

```
cd $CERESHOME/sarb/CER5.1P1/rcf  
./runsarb.pl CER5.1P1_PCF_$INSTANCE
```

Six files will be created by the Main-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE.met  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE.met  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE  
.met
```

Two files will be created by the HDF Post-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
```

3.6.1.1.1 Exit Codes

All CER5.1P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.6.1.1.2 Test Summary

Table 3-3. Test Summary for PGE 5.1P1

	Linux Cluster	
	FM1	FM2
Run Time	2:55 hours	2:55 hours
Memory	115296 k	115196 k
Required Disk Space	1364.55 MB	1364.55 MB

3.6.2 Evaluation Procedures

3.6.2.1 Log and Status File Results

The Error and Status Log Files for the Full-Hour Mode test case, CER5.1P1_LogReport_\${INSTANCE} and CER5.1P1_LogStatus_\${INSTANCE} are located in directory `$CERESHOME/sarb/runlogs` after PGE CER5.1P1 has been executed.

3.6.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.1P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory `$CERESHOME/sarb/data_exp/CER5.1P1`, using the diff command:

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

```
diff
  $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_${INSTANCE}.me
  t $CERESHOME/sarb/data_exp/CER5.1P1/CER_CRSB_${INSTANCE}.met
```

```
diff
  $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_${INSTANCE}.
  met
  $CERESHOME/sarb/data_exp/CER5.1P1/CER_CRSVB_${INSTANCE}.met
```

```
diff $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_${INSTANCE}.met
  $CERESHOME/sarb/data_exp/CER5.1P1/CER_CRS_${INSTANCE}.met
```

diff

```
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTAN  
CE.met
```

```
$CERESHOME/sarb/data_exp/CER5.1P1/CER_HQCR_$INSTANCE.met
```

3.6.2.3 Execution of Comparison Software for the Main-Processor

This section provides information on how to compile and execute the comparison software for the Instantaneous SARB Subsystem 5.1.

1. Execute the following to compare the binary output from the Main-Processor test case. Note that this software does not compare the HDF version of the CRS.

```
cd $CERESHOME/sarb/CER5.1P1/test_suites  
./run_crsb_compare CER_CRSB_$INSTANCE
```

One file will be created:

```
$CERESHOME/sarb/CER5.1P1/test_suites/CER_CRSB_$INSTANCE\_test_suites  
s_results
```

NOTE: The message “lib-4961 : WARNING” is repeated many times during the execution of this code. The cause is currently unknown. The results do not appear to be affected, however.

NOTE: The script run_crsb_compare removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

2. Compare the Quality Control Report for the Full-Hour Mode against the expected output: First, try to remove old output files IF they exist:

```
cd $CERESHOME/sarb/data_exp/CER5.1P1  
rm CER5.1P1_MainQC_FullHour_diff
```

diff

```
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTAN  
CE $CERESHOME/sarb/data_exp/CER5.1P1/CER_HQCR_$INSTANCE >  
$CERESHOME/sarb/data_exp/CER5.1P1/CER5.1P1_MainQC_FullHour_diff
```

Examine the output file:

more

```
$CERESHOME/sarb/data_exp/CER5.1P1/CER5.1P1_MainQC_FullHour_diff
```

The only differences should be in the Processing Date information in the Quality Control Report Header. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm.

3.6.2.4 Execution of Comparison Software for the HDF Post-Processor

Execute comparison software for the test case:

```
cd $CERESHOME/sarb/CER5.1P1/test_suites/crs_hdf
./run_crshdf_compare CER_CRS_$INSTANCE
```

If the comparison is unsuccessful, an output file listing the differences will be created:

```
$CERESHOME/sarb/CER5.1P1/test_suites/crs_hdf/CER_CRS_$INSTANCE\test_suites_results
```

3.6.2.5 Evaluation of Main-Processor Comparison Software Output

This section provides the procedure for evaluating the output from the Instantaneous SARB Subsystem 5.1.

1. Examine the comparison report files for the Main-Processor:

```
more
  $CERESHOME/sarb/CER5.1P1/test_suites/CER_CRSB_$INSTANCE\_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 2.

2. E-mail the files
\$CERESHOME/sarb/CER5.1P1/test_suites/CER_CRSB_\$INSTANCE.Diag, and
\$CERESHOME/sarb/data_exp/CER5.1P1/CER5.1P1_MainQC_FullHour_diff to
 ceresdmt+sarb@larc.nasa.gov@larc.nasa.gov.

3.6.2.6 Evaluation of the CRS HDF Product

1. During the executions of the HDF Post-Processor, if the SDS data or Vdata field data on the newly created HDF file,
\$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_\$INSTANCE matches the data on the provided CRS HDF file of the same name on
\$CERESHOME/sarb/data_exp/CER5.1P1, this message will appear when running the comparison software:

DONE: Files are the same

If this message does not appear, then notify responsible personnel.

3.6.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.1P1/rcf
```

For FM1:

```
source $CERESHOME/sarb/CER5.1P1/rcf/ssit-main-env-Terra-FM1.csh
setenv INSTANCE Terra-FM1-MODIS_Edition2B_999999.2006050100
```

For FM2:

```
source $CERESHOME/sarb/CER5.1P1/rcf/ssit-main-env-Terra-FM2.csh
setenv INSTANCE Terra-FM2-MODIS_Edition2B_999999.2006050100
```

```
./rm_script_5.1P1 CER5.1P1_PCF_$INSTANCE
```

2. Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.
3. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.7 PGE CER5.1P2--Main-Processor Aqua Test Case

3.7.1 Stand Alone Test Procedures

The Main-Processor production script, runsarb, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.1P2.pl, and then executing the PCF generator, pcfgen_5.1P2.pl.

In the production environment, ascii_gen_5.1P2.pl and pcfgen_5.1P2.pl must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.1P2.pl, requires one command line argument--the date parameter, formatted as YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data. The PCF generator, pcfgen_5.1P2.pl, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, runsarb.pl, followed by the name of the PCF generated by pcfgen_5.1P2.pl.

Since the Main-Processor can execute in two different modes, as discussed in Section 1.2.2, a test case for each mode is provided.

3.7.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/CER5.1P2/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env-Aqua-FM3.pl  
  $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env.pl  
setenv DATE 2006071500  
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.2006071500
```

For FM4:

```
cp $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env-Aqua-FM4.pl  
  $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env.pl  
setenv DATE 2006071500  
setenv INSTANCE Aqua-FM4-MODIS_Edition2C_999999.2006071500
```

Remove any existing output files:

```
$CERESHOME/sarb/CER5.1P2/rcf/rm_script_5.1P2.pl  
  CER5.1P2_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.1P2/rcf/ascii_gen_5.1P2.pl $DATE
```

The following file will be generated in **\$CERESHOME/sarb/CER5.1P2/rcf/pcf:**
CER5.1P2_PCFin_\$INSTANCE

2. Copy the SSFA input files provided with this delivery to the directories to which the PCF is pointing by typing:

```
cd $CERESHOME/sarb/data/input/sarb  
./CER5.1P2_InputFileMover.csh copyfiles
```

3. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/CER5.1P2/rcf  
$CERESHOME/sarb/CER5.1P2/rcf/pcfgen_5.1P2.pl  
CER5.1P2_PCFin_$INSTANCE
```

The following PCF will be generated in **\$CERESHOME/sarb/CER5.1P2/rcf/pcf:**
CER5.1P2_PCF_\$INSTANCE

4. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.1P2/rcf/pcf/CER5.1P2_PCF_$INSTANCE  
$CERESHOME/sarb/data_exp/CER5.1P2/CER5.1P2_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

5. Execute the Full-Hour Mode test case by typing:

```
cd $CERESHOME/sarb/CER5.1P2/rcf  
./runsarb.pl CER5.1P2_PCF_$INSTANCE
```

Six files will be created by the Main-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_$INSTANCE.met  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_$INSTANCE.met  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTANCE  
.met
```

Two files will be created by the HDF Post-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE  
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
```

3.7.1.1.1 Exit Codes

All CER5.1P2 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0 for each of the two executables.

3.7.1.1.2 Test Summary

Table 3-4. Test Summary for PGE 5.1P2

	Warlock		Linux Cluster	
	FM3	FM4	FM3	FM4
Run Time	4:56 hours	6:01 hours	1:21 hours	1:18 hours
Memory	126056 k	152536 k	126152 k	126152 k
Required Disk Space	1364.55 MB	1364.55 MB	1364.55 MB	1364.55 MB

3.7.2 Evaluation Procedures

3.7.2.1 Log and Status File Results

The Error and Status Log Files for the Full-Hour Mode test case, CER5.1P2_LogReport_\${INSTANCE} and CER5.1P2_LogStatus_\${INSTANCE} are located in directory \$CERESHOME/sarb/runlogs after PGE CER5.1P2 has been executed.

3.7.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.1P2 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory \$CERESHOME/sarb/data_exp/CER5.1P2, using the diff command:

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

diff

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSB_${INSTANCE}.met
t $CERESHOME/sarb/data_exp/CER5.1P2/CER_CRSB_${INSTANCE}.met
```

diff

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRSVB_${INSTANCE}.met
et $CERESHOME/sarb/data_exp/CER5.1P2/CER_CRSVB_${INSTANCE}.met
```

```
diff $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_${INSTANCE}.met
$CERESHOME/sarb/data_exp/CER5.1P2/CER_CRS_${INSTANCE}.met
```

diff

```
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_${INSTANCE}.met
CE.met
$CERESHOME/sarb/data_exp/CER5.1P2/CER_HQCR_${INSTANCE}.met
```

3.7.2.3 Execution of Comparison Software for the Main-Processor

This section provides information on how to compile and execute the comparison software for the Instantaneous SARB Subsystem 5.1.

1. Execute the following to compare the binary output from the Main-Processor test case. Note that this software does not compare the HDF version of the CRS.

```
cd $CERESHOME/sarb/CER5.1P2/test_suites/  
./run_crsb_compare.pl CER_CRSB_$INSTANCE
```

One file will be created:

```
$CERESHOME/sarb/CER5.1P2/test_suites  
/CER_CRSB_$INSTANCE\_test_suites_results
```

NOTE: The message “lib-4961 : WARNING” is repeated many times during the execution of this code. The cause is currently unknown. The results do not appear to be affected, however.

NOTE: The script run_crsb_compare.pl removes any output files left over from previous executions if they exist. If a file the script is attempting to remove does not exist, a message is written to the screen.

2. Compare the Quality Control Report for the Full-Hour Mode against the expected output:

First, try to remove old output files IF they exist:

```
cd $CERESHOME/sarb/data_exp/CER5.1P2  
rm CER5.1P2_MainQC_FullHour_diff  
diff  
$CERESHOME/sarb/data/out_comp/qa_reports/sarb/CER_HQCR_$INSTAN  
CE $CERESHOME/sarb/data_exp/CER5.1P2/CER_HQCR_$INSTANCE >  
$CERESHOME/sarb/data_exp/CER5.1P2/CER5.1P2_MainQC_FullHour_diff
```

Examine the output file:

```
more  
$CERESHOME/sarb/data_exp/CER5.1P2/CER5.1P2_MainQC_FullHour_diff
```

The only differences should be in the Processing Date information in the Quality Control Report Header. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm.

3.7.2.4 Execution of Comparison Software for the HDF Post-Processor

Execute comparison software for the test case:

```
cd $CERESHOME/sarb/CER5.1P2/test_suites/crs_hdf  
./run_crshdf_compare.pl CER_CRSB_$INSTANCE > CER5.1P2_FullOut
```

3.7.2.5 Evaluation of Main-Processor Comparison Software Output

This section provides the procedure for evaluating the output from the Instantaneous SARB Subsystem 5.1.

1. Examine the comparison report files for the Main-Processor:

more

```
$CERESHOME/sarb/CER5.1P2/test_suites/CER_CRSB_${INSTANCE}_test_suites_results
```

If all goes well, there will be a line indicating that no mismatches were found when comparing the results produced by the Langley ASDC with those produced by the CERES team. Some mismatches might occur due to computer precision, thus, there is no need for immediate alarm. Just perform Step 2.

2. E-mail the files **\$CERESHOME/sarb/CER5.1P2/test_suites/CER_CRSB_\${INSTANCE}.Diag**, and **\$CERESHOME/sarb/data_exp/CER5.1P2/CER5.1P2_MainQC_FullHour_diff** to **ceresdmt+sarb@larc.nasa.gov@larc.nasa.gov**.

3.7.2.6 Evaluation of the CRS HDF Product

During the executions of the HDF Post-Processor, if the SDS data on the newly created HDF file, **\$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRB_\${INSTANCE}** matches the data on the provided CRS HDF file of the same name on **\$CERESHOME/sarb/data_exp/CER5.1P2**, There will be no messages printed in the file, **\$CERESHOME/sarb/CER5.1P2/test_suites/crs_hdf/CER5.1P2_FullOut**. **Only if the two HDF files are different will there be any messages in this file.**

To examine the output produced by the HDF Post-Processor for the Full-Hour Mode, type:

```
cd $CERESHOME/sarb/CER5.1P2/test_suites/crs_hdf  
more CER5.1P2_FullOut
```

3.7.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.1P2/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env-Aqua-FM3.pl  
$CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env.pl  
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.2006071500
```

For FM4:

```
cp $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env-Aqua-FM4.pl  
  $CERESHOME/sarb/CER5.1P2/rcf/ssit-main-env.pl  
setenv INSTANCE Aqua-FM4-MODIS_Edition2C_999999.2006071500
```

```
./rm_script_5.1P2.pl CER5.1P2_PCF_$INSTANCE
```

2. Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.
3. A “No match” indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.8 PGE CER5.3P1--HDF Post-Processor TRMM Test Case

3.8.1 Stand Alone Test Procedures

The HDF Post-Processor production script, `runsarb_post`, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, `ascii_gen_5.3P1`, and then executing the PCF generator, `pcfgen_5.3P1`.

In the production environment, `ascii_gen_5.3P1` and `pcfgen_5.3P1` must be executed to create the PCF for each production run. The ASCII file generator, `ascii_gen_5.3P1`, requires one command line argument--the date parameter, formatted as `YYYYMMDDHH`, where `YYYY` is the 4-digit year, `MM` is the 2-digit month, `DD` is the 2-digit day and `HH` is the 2-digit hour of the data. The PCF generator, `pcfgen_5.3P1`, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, `runsarb_post`, followed by the name of the PCF generated by `pcfgen_5.3P1`.

3.8.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/bin/sarb
cp $CERESHOME/sarb/bin/sarb/ssit-post-env-TRMM.pl
  $CERESHOME/sarb/bin/sarb/ssit-post-env.pl
```

Set the Date and Instance variables:

```
setenv DATE 1998050100
setenv $INSTANCE TRMM-PFM-VIRS_SSIT_999999.1998050100
$CERESHOME/sarb/bin/sarb/rm_script_5.3P1.pl CER5.3P1_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/bin/sarb/ascii_gen_5.3P1.pl $DATE
```

The following file will be generated in `$CERESHOME/sarb/rcf/PCFgen/sarb:`

```
CER5.3P1_PCFin_$INSTANCE
```

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/bin/sarb
$CERESHOME/sarb/bin/sarb/pcfgen_5.3P1.pl CER5.3P1_PCFin_$INSTANCE
```

The following PCF will be generated in `$CERESHOME/sarb/rcf/pcf/sarb:`

```
CER5.3P1_PCF_$INSTANCE
```

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/rcf/pcf/sarb/CER5.3P1_PCF_$INSTANCE
    $CERESHOME/sarb/data/out_exp/data/sarb/CER5.3P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Execute the test case by typing:

```
cd $CERESHOME/sarb/bin/sarb
./runsarb_post.pl CER5.3P1_PCF_$INSTANCE
```

Two files will be created by the HDF Post-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE
    $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
```

3.8.1.1.1 Exit Codes

All CER5.3P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0.

3.8.1.1.2 Test Summary

Total Run Time:	1:42 Minutes
Memory:	157928 k
Required Disk Space:	346 MB

3.8.1.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.3P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory **\$CERESHOME/sarb/data/out_exp/data/sarb**, using the diff command.

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

```
diff $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
    $CERESHOME/sarb/data/out_exp/data/sarb/CER_CRS_$INSTANCE.met
```

3.8.1.3 Execution of Comparison Software for the HDF Post-Processor

Execute comparison software for the test case

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf
./run_crshdf_compare CER_CRS_$INSTANCE > CER5.3P1_FullOut
```

3.8.1.4 Evaluation of the CRS HDF Product

1. During the executions of the HDF Post-Processor, if the SDS data or Vdata field data on the newly created HDF file, **\$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_\$INSTANCE** matches the data on the provided CRS HDF file of the same name on **\$CERESHOME/sarb/data/out_exp/data/sarb**, 'OK.' is appended to the end of the output line as follows:

```
Comparing SDS    "....." data... OK.
                or
Comparing Vfield "....." data... OK.
```

The only differences between the two HDF output files should be the dates on Vfields: "CRS_DATE" on the "CRS_Header_Vdata" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata. Another possible acceptable difference is in the "INST_SARBVER" Vdata.

To examine the output produced by the HDF Post-Processor, type

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf
more CER5.3P1_FullOut
```

3.8.2 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/bin/sarb
```

For the test case:

```
./rm_script_5.3P1.pl CER5.3P1_PCF_$INSTANCE
```

2. Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.
3. A "No match" indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.9 PGE CER5.3P1--HDF Post-Processor Terra Test Case

3.9.1 Stand Alone Test Procedures

The HDF Post-Processor production script, runsarb_post, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.3P1, and then executing the PCF generator, pcfgen_5.3P1.

In the production environment, ascii_gen_5.3P1 and pcfgen_5.3P1 must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.3P1, requires one command line argument--the date parameter, formatted as YYYYMMDDHH, where YYYY is the 4-digit year, MM is the 2-digit month, DD is the 2-digit day and HH is the 2-digit hour of the data. The PCF generator, pcfgen_5.3P1, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, runsarb, followed by the name of the PCF generated by pcfgen_5.3P1.

3.9.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/bin/sarb
cp $CERESHOME/sarb/bin/sarb/ssit-post-env-Terra.pl
  $CERESHOME/sarb/bin/sarb/ssit-post-env.pl
```

Set the Date and Instance variables:

```
setenv DATE 2002072002072002071200
setenv INSTANCE Terra-FM2-MODIS_SSIT_999999.2002072002072002071200
$CERESHOME/sarb/bin/sarb/rm_script_5.3P1 CER5.3P1_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/bin/sarb/ascii_gen_5.3P1.pl $DATE
```

The following file will be generated in \$CERESHOME/sarb/rcf/PCFgen/sarb:

```
CER5.3P1_PCFin_$INSTANCE
```

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/bin/sarb
$CERESHOME/sarb/bin/sarb/pcfgen_5.3P1.pl CER5.3P1_PCFin_$INSTANCE
```

The following PCF will be generated in \$CERESHOME/sarb/rcf/pcf/sarb:

```
CER5.3P1_PCF_$INSTANCE
```

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/rcf/pcf/sarb/CER5.3P1_PCF_$INSTANCE
    $CERESHOME/sarb/data/out_exp/data/sarb/CER5.3P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Copy the SSFA input file provided with this delivery to the directory to which the PCF is pointing by typing:

```
cd $CERESHOME/sarb/data/input/sarb
./CER5.3P1_InputFileMover.csh copyfiles
```

5. Execute the test case by typing:

```
cd $CERESHOME/sarb/bin/sarb
./runsarb_post.pl CER5.3P1_PCF_$INSTANCE
```

Two files will be created by the HDF Post-Processor:

```
$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE
    $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_$INSTANCE.met
```

3.9.1.1.1 Exit Codes

All CER5.3P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0.

3.9.1.1.2 Test Summary

Total Run Time:	2:34 Minutes
Memory:	207808 k
Required Disk Space:	345.20 MB

3.9.2 Evaluation Procedures

3.9.2.1 Log and Status File Results

The Error and Status Log Files for the test case, CER5.3P1_LogReport_\$INSTANCE and CER5.3P1_LogStatus_\$INSTANCE are located in directory **\$CERESHOME/sarb/data/runlogs/sarb** after PGE CER5.3P1 has been executed.

3.9.2.2 Metadata Evaluation

Metadata files which end in extension, '.met', are located in the same directories as their corresponding output files after CER5.3P1 has been executed. Compare the metadata contained in these files with the expected contents of the files with the same names found in directory **\$CERESHOME/sarb/data/out_exp/data/sarb**, using the diff command:

The only differences between the files should be the production times and differences in the directory paths where the tests were run.

```
diff $CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_${INSTANCE}.met
    $CERESHOME/sarb/data/out_exp/data/sarb/CER_CRS_${INSTANCE}.met
```

3.9.2.3 Execution of Comparison Software for the HDF Post-Processor

Execute comparison software for the test case:

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf
./run_crshdf_compare CER_CRS_${INSTANCE} > CER5.3P1_FullOut
```

3.9.2.4 Evaluation of the CRS HDF Product

1. During the executions of the HDF Post-Processor, if the SDS data or Vdata field data on the newly created HDF file, `$CERESHOME/sarb/data/out_comp/data/sarb/CER_CRS_Terra-FM2-MODIS_SSIT_999999.2002072002072002071200` matches the data on the provided CRS HDF file of the same name on `$CERESHOME/sarb/data/out_exp/data/sarb`, 'OK.' is appended to the end of the output line as follows:

```
Comparing SDS " ....." data... OK.
or
Comparing Vfield "....." data... OK.
```

The only differences between the two HDF output files should be the dates on Vfields: "CRS_DATE" on the "CRS_Header_Vdata" Vdata and "CERPRODUCTIONDATETIME" on the "CERES_metadata" Vdata. If CERESLIB has changed, the date may be different in the "LOCALVERSIONID" on the "CERES_metadata" Vdata. Another possible acceptable difference is in the "INST_SARBVER" Vdata.

To examine the output produced by the HDF Post-Processor, type

```
cd $CERESHOME/sarb/test_suites/sarb/src/mainss5/crs_hdf
more CER5.3P1_FullOut
```

3.9.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/bin/sarb
./rm_script_5.3P1.pl CER5.3P1_PCF_${INSTANCE}
```

Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.

2. A "No match" indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.10 PGE CER5.4P1--Monthly QC Processor for Terra

3.10.1 Stand Alone Test Procedures

The Monthly QC Processor production script, run_postss5, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.4P1, and then executing the PCF generator, pcfgen_5.4P1.

In the production environment, ascii_gen_5.4P1 and pcfgen_5.4P1 must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.4P1, requires one command line argument--the date parameter, formatted as YYYYMM, where YYYY is the 4-digit year and MM is the 2-digit month. The PCF generator, pcfgen_5.4P1, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, run_postss5, followed by the name of the PCF generated by pcfgen_5.4P1.

3.10.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/CER5.4P1/bin
```

For FM1:

```
source $CERESHOME/sarb/CER5.4P1/rcf/ssit-post-env-TerraFM1.csh
setenv DATE 200605
setenv INSTANCE Terra-FM1-MODIS_Edition2B_999999.200605
```

For FM2:

```
source $CERESHOME/sarb/CER5.4P1/rcf/ssit-post-env-TerraFM2.csh
setenv DATE 200605
setenv INSTANCE Terra-FM2-MODIS_Edition2B_999999.200605
```

Remove any existing output files:

```
$CERESHOME/sarb/CER5.4P1/rcf/rm_script_5.4P1
CER5.4P1_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.4P1/rcf/ascii_gen_5.4P1 $DATE
```

The following file will be generated in \$CERESHOME/sarb/CER5.4P1/rcf/pcf:
CER5.4P1_PCFin_\$INSTANCE

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/CER5.4P1/rcf
$CERESHOME/sarb/CER5.4P1/rcf/pcfgen_5.4P1
CER5.4P1_PCFin_$INSTANCE
```

The following PCF will be generated in `$CERESHOME/sarb/CER5.4P1/rcf/pcf/`:
CER5.4P1_PCF_\$INSTANCE

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.4P1/rcf/pcf/CER5.4P1_PCF_$INSTANCE
$CERESHOME/sarb/data_exp/CER5.4P1//CER5.4P1_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Remove default limits on available memory:

```
unlimit
```

5. Execute the test case by typing:

```
cd $CERESHOME/sarb/CER5.4P1/rcf
./run_postss5 CER5.4P1_PCF_$INSTANCE
```

3.10.1.1.1 Exit Codes

All CER5.4P1 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0.

3.10.1.1.2 Test Summary

Table 3-5. Test Summary for PGE 5.4P1

	Linux Cluster	
	FM1	FM2
Run Time	4:16 minutes	4:22 minutes
Memory	22488 k	22504 k
Required Disk Space	1353 MB	1353 MB

3.10.2 Evaluation Procedures

3.10.2.1 Log and Status File Results

The Error and Status Log Files for the test case, `CER5.4P1_LogReport_$INSTANCE` and `CER5.4P1_LogStatus_$INSTANCE` are located in directory `$CERESHOME/sarb/runlogs` after PGE CER5.4P1 has been executed.

3.10.2.2 Output Evaluation

The PGE 5.4P1 produces no output files. If a non-zero exit code is returned, please contact the responsible personnel listed in Table 5-1 of the operator's manual.

Please make the corresponding ASCII, PCF, and Log files available to the responsible personnel.

The only difference between the files should be the date when the reports were generated.

3.10.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.4P1/rcf
```

For FM1:

```
source $CERESHOME/sarb/CER5.4P1/rcf/ssit-qc-env-Terra-FM1.csh  
setenv INSTANCE Terra-FM1-MODIS_Edition2B_999999.200605
```

For FM2:

```
source $CERESHOME/sarb/CER5.4P1/rcf/ssit-qc-env-Terra-FM2.csh  
setenv INSTANCE Terra-FM2-MODIS_Edition2B_999999.200605
```

```
./rm_script_5.4P1 CER5.4P1_PCF_$INSTANCE
```

Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.

2. A "No match" indicates there were no files to delete during execution of a script. This message does not indicate a problem.

3.11 PGE CER5.4P2--Monthly QC Processor for Aqua

3.11.1 Stand Alone Test Procedures

The Monthly QC Processor production script, run_postss5, references a Process Control File (PCF) which contains the correct file names and paths for the test procedures. The PCF is created by first executing an ASCII file generator, ascii_gen_5.4P2.pl, and then executing the PCF generator, pcfgen_5.4P2.pl.

In the production environment, ascii_gen_5.4P2.pl and pcfgen_5.4P2.pl must be executed to create the PCF for each production run. The ASCII file generator, ascii_gen_5.4P2.pl, requires one command line argument--the date parameter, formatted as YYYYMM, where YYYY is the 4-digit year and MM is the 2-digit month. The PCF generator, pcfgen_5.4P2.pl, is then executed using the newly created ASCII input file name as a command line argument. Execute the production script by typing the script name, run_postss5.pl, followed by the name of the PCF generated by pcfgen_5.4P2.pl.

3.11.1.1 PCF Generation and Execution

1. Generate the ASCII input file for the test case:

```
cd $CERESHOME/sarb/CER5.4P2/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env-Aqua-FM3.pl
  $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env.pl
setenv DATE 200605
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.200605
```

For FM4:

```
cp $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env-Aqua-FM4.pl
  $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env.pl
setenv DATE 200503
setenv INSTANCE Aqua-FM4-MODIS_Edition2B_999999.200503
```

Remove any existing output files:

```
$CERESHOME/sarb/CER5.4P2/rcf/rm_script_5.4P2.pl
  CER5.4P2_PCF_$INSTANCE
```

Execute the ASCII file generator:

```
$CERESHOME/sarb/CER5.4P2/rcf/ascii_gen_5.4P2.pl $DATE
```

The following file will be generated in \$CERESHOME/sarb/CER5.4P2/rcf/pcf:

```
CER5.4P2_PCFin_$INSTANCE
```

2. Generate the PCF for the test case:

```
cd $CERESHOME/sarb/CER5.4P2/rcf
$CERESHOME/sarb/CER5.4P2/rcf/pcfgen_5.4P2.pl
CER5.4P2_PCFin_$INSTANCE
```

The following PCF will be generated in `$CERESHOME/sarb/CER5.4P2/rcf/pcf:`
CER5.4P2_PCF_\$INSTANCE

3. Compare the PCF for the test case with the PCF provided in this delivery, using the diff command:

```
diff $CERESHOME/sarb/CER5.4P2/rcf/pcf/CER5.4P2_PCF_$INSTANCE
$CERESHOME/sarb/data_exp/CER5.4P2/CER5.4P2_PCF_$INSTANCE
```

The only differences between the files should be in the directory paths where the tests were run.

4. Execute the test case by typing:

```
cd $CERESHOME/sarb/CER5.4P2/rcf
./run_postss5.pl CER5.4P2_PCF_$INSTANCE
```

3.11.1.1.1 Exit Codes

All CER5.4P2 software terminates using the CERES defined EXIT CODES for the Langley TRMM Information System (LaTIS). Successful completion is indicated by an exit code of 0. This test should complete with an exit code of 0.

3.11.1.1.2 Test Summary

Table 3-6. Test Summary for PGE 5.4P2

	Warlock		Linux Cluster	
	FM3	FM4	FM3	FM4
Run Time	11:14 minutes	11:29 minutes	5:58 minutes	6:01 minutes
Memory	37096 k	37128 k	37000 k	37000 k
Required Disk Space	1353 MB	1353 MB	1353 MB	1353 MB

3.11.2 Evaluation Procedures

3.11.2.1 Log and Status File Results

The Error and Status Log Files for the test case, `CER5.4P2_LogReport_$INSTANCE` and `CER5.4P2_LogStatus_$INSTANCE` are located in directory `$CERESHOME/sarb/runlogs/` after PGE CER5.4P2 has been executed.

3.11.2.2 Output Evaluation

The PGE 5.4P2 produces no output files. If a non-zero exit code is returned, please contact the responsible personnel listed in Table 5-1 of the operator's manual.

Please make the corresponding ASCII, PCF, and Log files available to the responsible personnel.

3.11.3 Solutions to Possible Problems

1. All output files must be deleted or renamed in order to run the production software properly again. To use the provided script, type the following:

```
cd $CERESHOME/sarb/CER5.4P2/rcf
```

For FM3:

```
cp $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env-Aqua-FM3.pl  
$CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env.pl  
setenv INSTANCE Aqua-FM3-MODIS_Edition2C_999999.200605
```

For FM4:

```
cp $CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env-Aqua-FM4.pl  
$CERESHOME/sarb/CER5.4P2/rcf/ssit-post-env.pl  
setenv INSTANCE Aqua-FM4-MODIS_Edition2B_999999.200503
```

```
./rm_script_5.4P2.pl CER5.4P2_PCF_$INSTANCE
```

Environment variables, HDFLIB and HDFINC, must point to the NAG 32-bit Toolkit directories during evaluation of the CRS HDF product. These variables must point to the SGI 64-bit Toolkit directories during all other testing procedures.

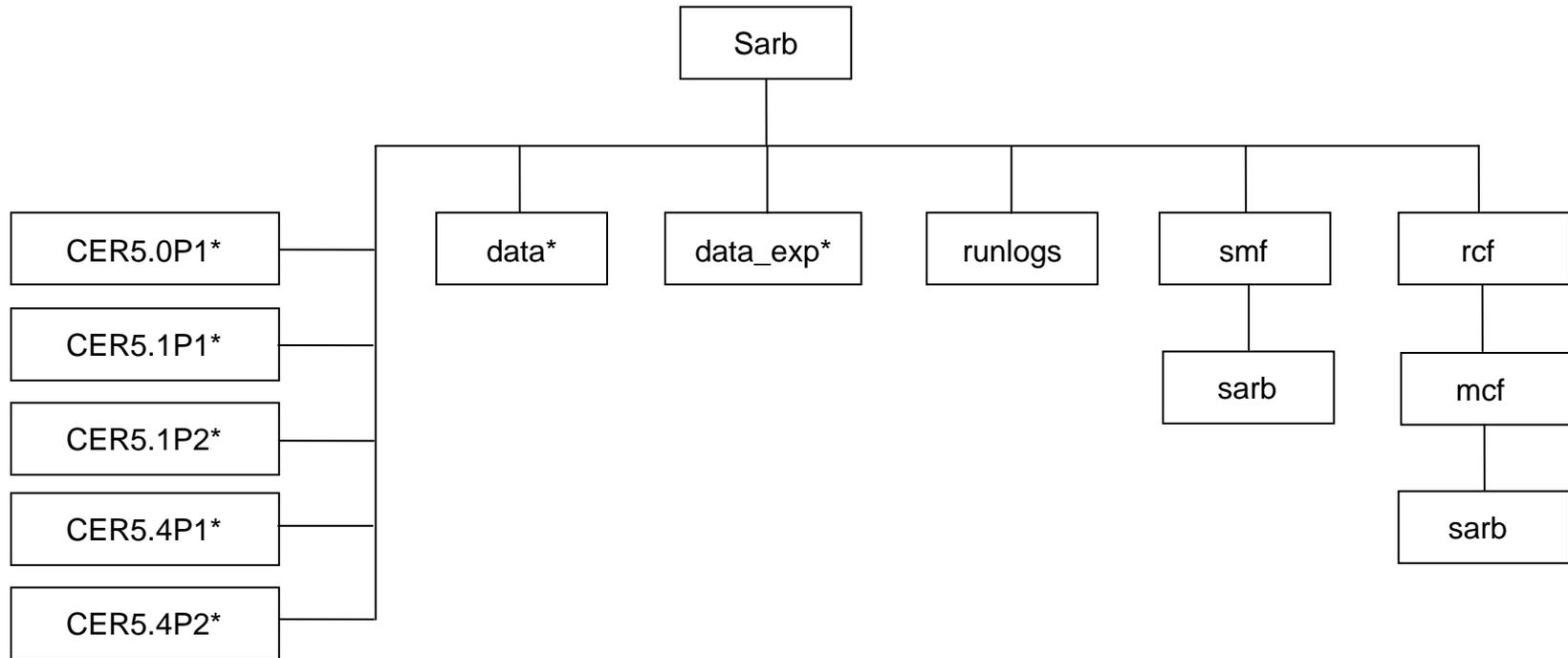
2. A "No match" indicates there were no files to delete during execution of a script. This message does not indicate a problem.

Appendix A Acronyms and Abbreviations

ASDC	Atmospheric Science Data Center
CERES	Clouds and the Earth's Radiant Energy System
CERESlib	CERES library
CRS	Clouds and Radiation Swath
CRSB	Clouds and Radiation Swath Binary
DAAC	Distributed Active Archive Center
DRIVTAB	Derivative Table
EOS	Earth Observing System
EOS-AM	EOS Morning Crossing Mission
EOS-PM	EOS Afternoon Crossing Mission
ERBE	Earth Radiation Budget Experiment
ERBS	Earth Radiation Budget Satellite
FOV	Field-of-View
GFDL	Geophysical Fluid Dynamics Laboratory
HDF	Hierarchical Data Format
LaTIS	Langley TRMM Information System
MCF	Metadata Control Files
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executive
QC	Quality Control
SAH	Surface Albedo History
SARB	Surface and Atmospheric Radiation Budget
SCF	Science Computing Facility
SMF	Status Message Facility
TRMM	Tropical Rainfall Measuring Mission

Appendix B
Directory Structure Diagrams

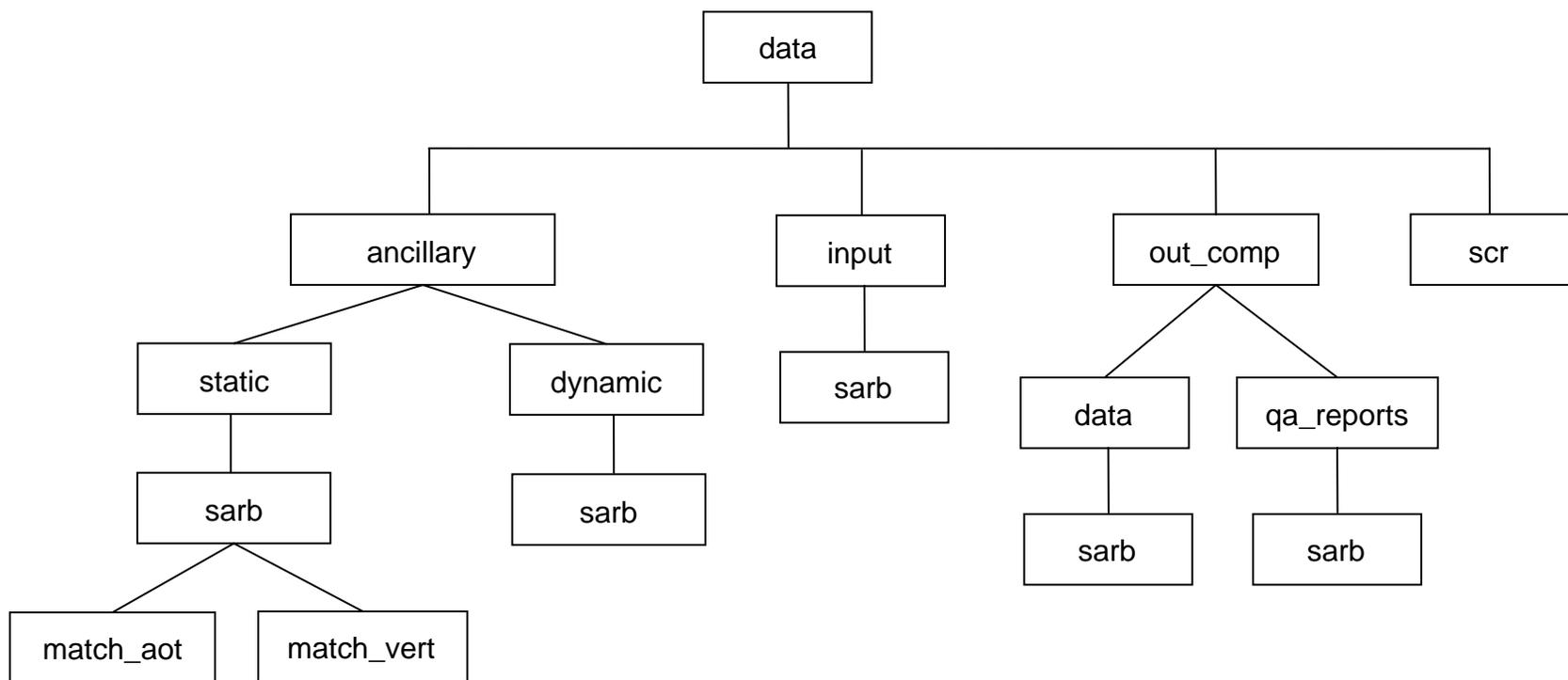
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



* Represents other tables to display subpaths.

Figure B-1. Instantaneous SARB Directory Structure.

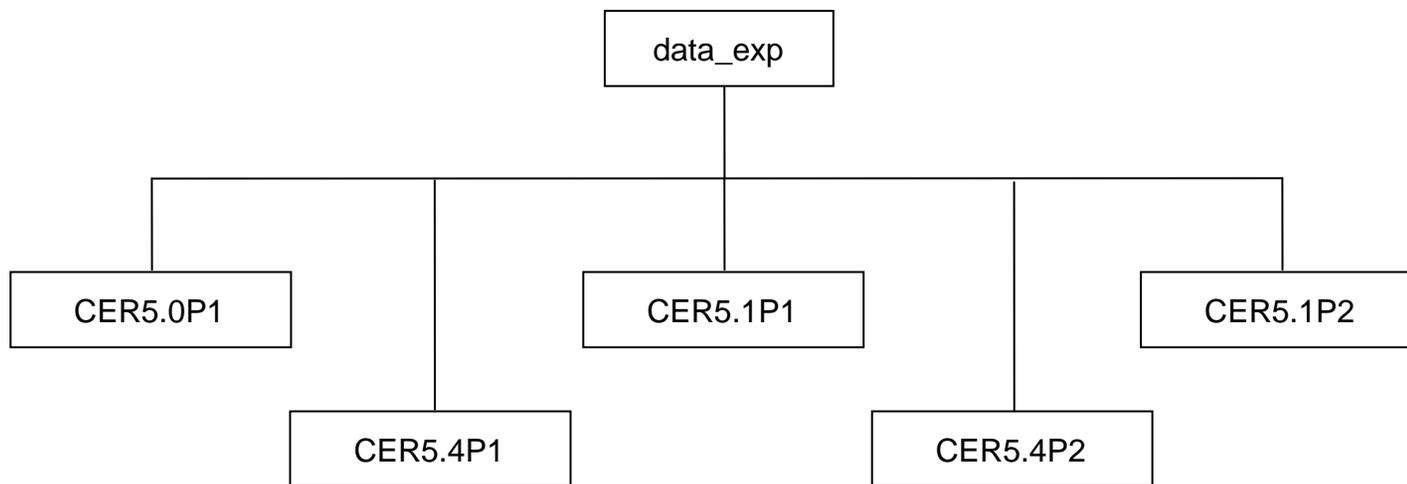
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-2

Figure B-1. Instantaneous SARB Directory Structure.

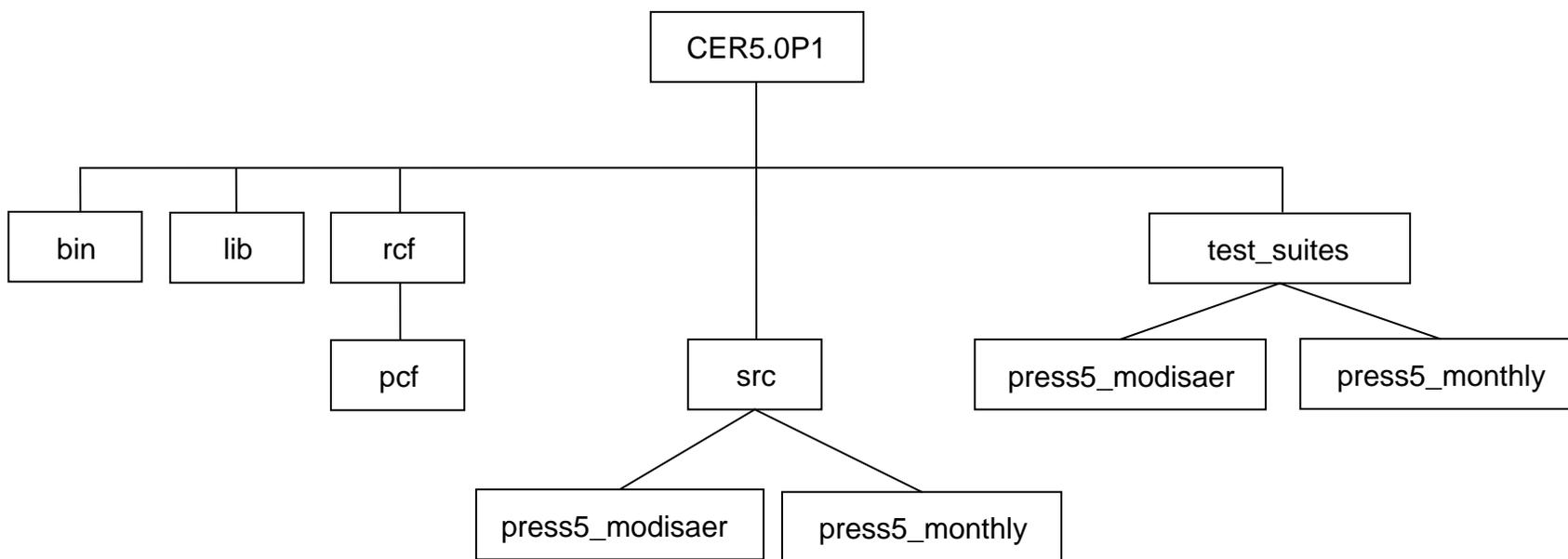
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-3

Figure B-1. Instantaneous SARB Directory Structure.

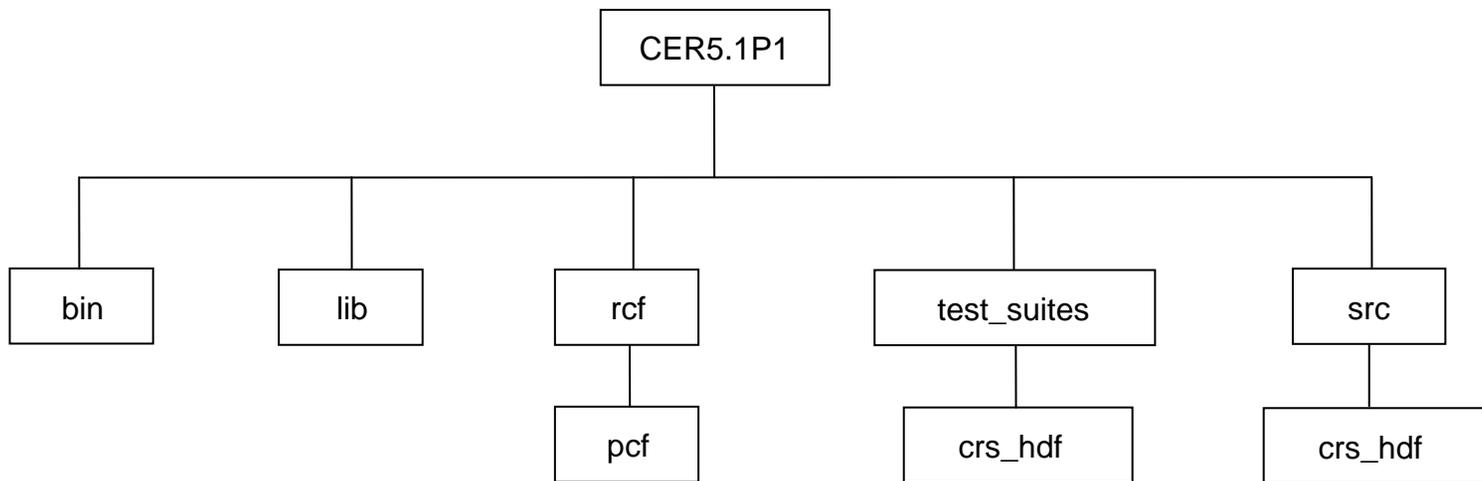
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-4

Figure B-1. Instantaneous SARB Directory Structure.

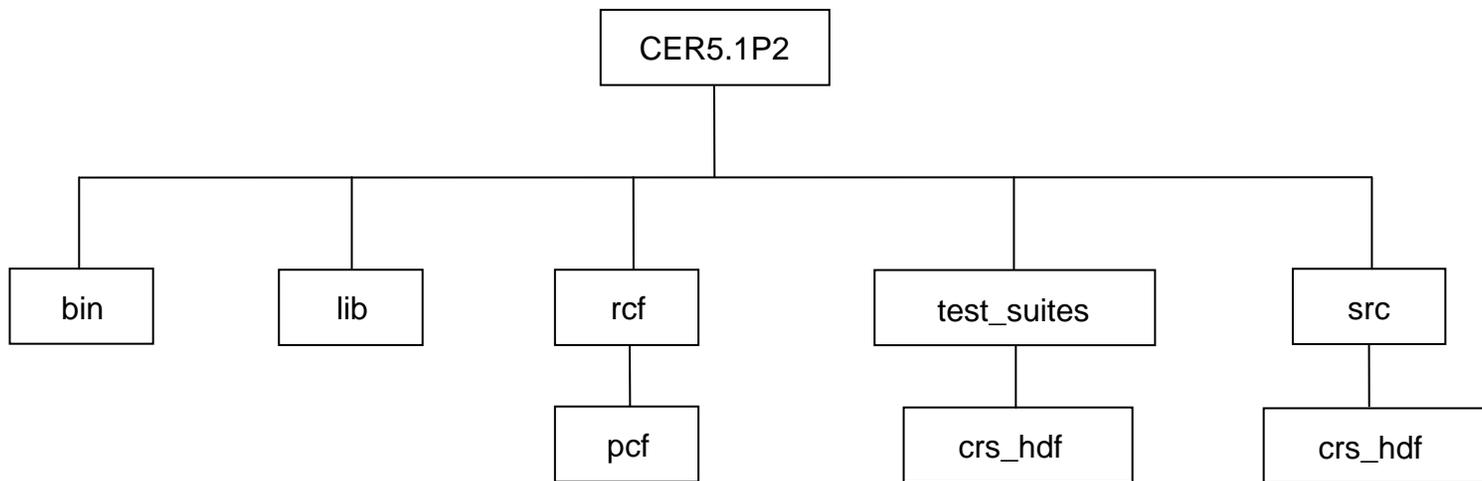
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-5

Figure B-1. Instantaneous SARB Directory Structure.

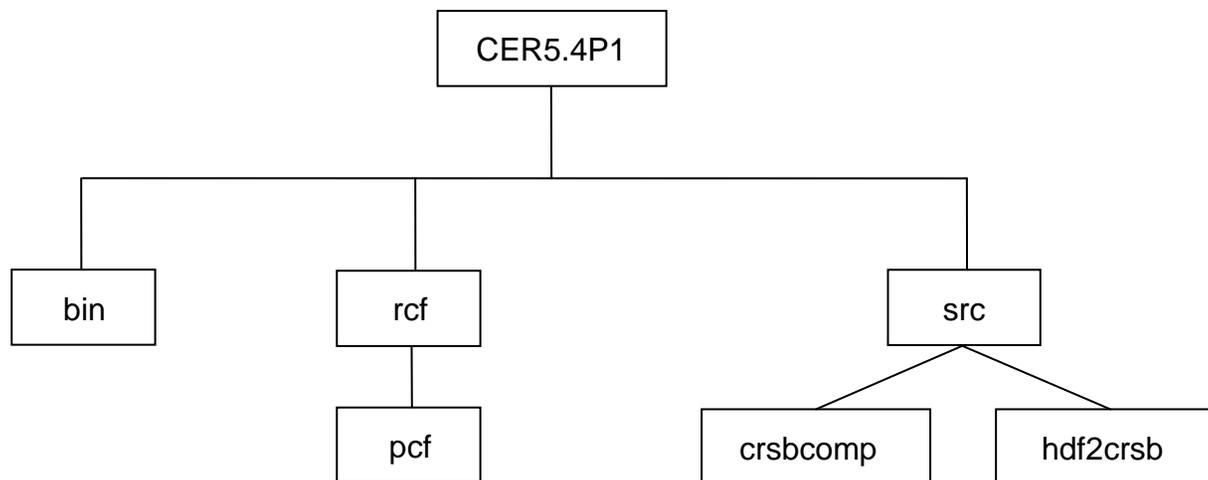
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-6

Figure B-1. Instantaneous SARB Directory Structure.

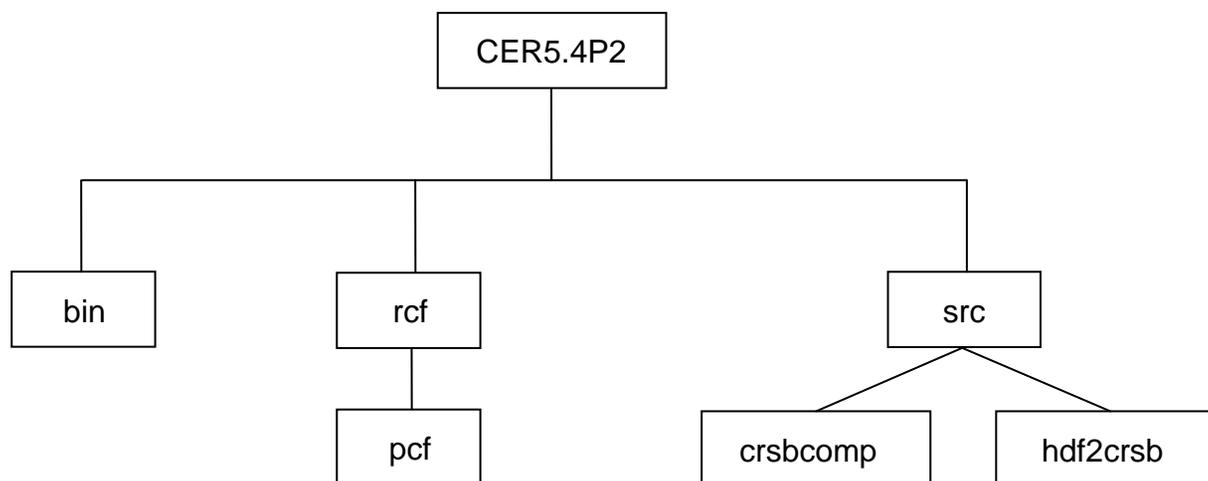
BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-7

Figure B-1. Instantaneous SARB Directory Structure.

BREAKDOWN OF THE INSTANTANEOUS SARB DIRECTORY STRUCTURE



B-8

Figure B-1. Instantaneous SARB Directory Structure.

Appendix C File Description Tables

C.1 Production Scripts and Executables

Table C.1-1. Production Scripts

File Name	Format	Description
ascii_gen_5.1P1.pl	ASCII	Perl script which creates the PCF generator's ASCII file needed by both the Main-Processor and the HDF Post-Processor
ascii_gen_5.2P1	ASCII	C-Shell script which creates the PCF generator's ASCII file needed by the Surface Albedo Daily Pre-Processor
ascii_gen_5.3P1	ASCII	C-Shell script which creates the PCF generator's ASCII file needed by the Monthly HDF Post Processor
ascii_gen_5.0P1.pl	ASCII	Perl script which creates the PCF generator's ASCII file needed by the Surface Albedo Monthly Pre-Processor
ascii_gen_5.4P1	ASCII	C-Shell script which creates the PCF generator's ASCII file needed by the Monthly QC Processor
pcfgen_5.1P1.pl	ASCII	Perl script which creates the PCF for both the Main-Processor and the HDF Post-Processor
pcfgen_5.2P1	ASCII	C-Shell script which creates the PCF for the Surface Albedo Daily Pre-Processor
pcfgen_5.3P1	ASCII	C-Shell script which creates the PCF for the Monthly HDF Post Processor
pcfgen_5.0P1.pl	ASCII	Perl script which creates the PCF for the Surface Albedo Monthly Pre-Processor
pcfgen_5.4P1	ASCII	C-Shellsript which creates the PCF for the Monthly QC Processor
runsarb.pl	ASCII	Perl script which executes both the Main-Processor and the HDF Post-Processor
runsarb_post.pl	ASCII	Perl script which executes the HDF Post-Processor
run_press5.pl	ASCII	Perl script which executes the Surface Albedo Monthly Pre-Processor
run_postss5.pl	ASCII	Perl script which executes the Monthly QC Processor

Table C.1-2. Executables

File Name	Format	Description
InstSARB_Drv.exe ¹	Binary	Main-Processor executable
crs2hdf.exe ¹	Binary	HDF Post-Processor executable
modis_aer.exe	Binary	MODIS Aerosol map executable
sfcalbhist_drv.exe	Binary	Surface Albedo Monthly Pre-Processor executable
sarbmonqc.exe	Binary	Monthly QC Processor executable
hdf2crsb.exe	Binary	HDF to binary conversion executable
crsbcheck.exe	Binary	CRSB comparison executable

¹These files will be generated on execution of Subsystem software and are not included in the tar file.

C.2 Processing Control Files (PCF), Metadata Control Files (MCF) and Status Message Files (SMF)

The Process Control Files are not included in the Software Delivery Package. They will be created by the PCF generator scripts.

Table C.2-1. Metadata Control Files

File Name	Format	Description
mcf_sarbqc	ODL	MCF for Binary QC Report for Main-Processor
mcf_sarbhdf	ODL	MCF for CRS's HDF file for HDF Post-Processor
mcf_sarb	ODL	MCF for Binary CRS file for Main-Processor
mcf_monthly_aer	ODL	MCF for MODIS Aerosol file for MODIS Pre-Processor
mcf_daily_sah	ODL	MCF for Daily Surface Albedo files for Surface Albedo Pre-Processor
mcf_monthly_sahprod	ODL	MCF for Monthly Surface Albedo files for Surface Albedo Monthly Pre-Processor--production use
mcf_monthly_sahcurr	ODL	MCF for Monthly Surface Albedo files for Surface Albedo Monthly Pre-Processor--SSF data only
mcf_monthly_sahqc	ODL	MCF for Monthly Surface Albedo files for Surface Albedo Monthly Pre-Processor Quality Control Report

Table C.2-2. Process Control Files

File Name	Format	Description
CER5.1P1_PCF_TRMM-PFM-VIRS_SSIT_999999.1998050100 ¹	ASCII	Process Control File for Main-Processor - Full-Hour Mode
CER5.1P1_PCF_TRMM-PFM-VIRS_SubsetSSIT_999999.1998050101 ¹	ASCII	Process Control File for Main-Processor - Subset Mods
CER5.3P1_PCF_TRMM-PFM-VIRS_SSIT-New_999999.19980501	ASCII	Process Control File for HDF Post-Processor
CER5.0P1_PCF_TRMM-PFM-VIRS_SSIT-Monthly_999999.1998051	ASCII	Process Control File template for Surface Albedo Monthly Pre-Processor
CER5.4P1_PCF_TRMM-PFM-VIRS_SSIT-Monthly_999999.1998051	ASCII	Process Control File template for Monthly QC Processor

¹These files will be generated on execution of Subsystem software and are not included in the tar file.

Table C.2-3. Status Message Files (SMF)

File Name	Format	Directory	Description
ANCINIT_25725.t	ASCII	smf/sarb	Toolkit Message File
PGS_25725 ¹	ASCII	PGS_message/sarb	Toolkit Message File
FLSALUT_25724.t	ASCII	smf/sarb	Toolkit Message File
PGS_25724 ¹	ASCII	PGS_message/sarb	Toolkit Message File
GADSAER_25715.t	ASCII	smf/sarb	Toolkit Message File
PGS_25715 ¹	ASCII	PGS_message/sarb	Toolkit Message File
GFDLAER_25716.t	ASCII	smf/sarb	Toolkit Message File
PGS_25716 ¹	ASCII	PGS_message/sarb	Toolkit Message File
HCMOCNALB_225723.t	ASCII	smf/sarb	Toolkit Message File
PGS_225723 ¹	ASCII	PGS_message/sarb	Toolkit Message File
IGBPUTIL_25721.t	ASCII	smf/sarb	Toolkit Message File
PGS_25721 ¹	ASCII	PGS_message/sarb	Toolkit Message File
INITSARB_25701.t	ASCII	smf/sarb	Toolkit Message File
PGS_25701 ¹	ASCII	PGS_message/sarb	Toolkit Message File
MSFCALBIO_25722.t	ASCII	smf/sarb	Toolkit Message File

Table C.2-3. Status Message Files (SMF)

File Name	Format	Directory	Description
PGS_25722 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_INGEST_25702.t	ASCII	smf/sarb	Toolkit Message File
PGS_25702 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_SIGMALOAD_25703.t	ASCII	smf/sarb	Toolkit Message File
PGS_25703 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_TUNEDRV_25704.t	ASCII	smf/sarb	Toolkit Message File
PGS_25704 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_FLXRANGE_25705.t	ASCII	smf/sarb	Toolkit Message File
PGS_25705 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_FLMODEL_25706.t	ASCII	smf/sarb	Toolkit Message File
PGS_25706 ¹	ASCII	PGS_message/sarb	Toolkit Message File
SARBMETA_25726.t	ASCII	smf/sarb	Toolkit Message File
PGS_25726 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_MODISAERRD_25751.t		smf/sarb	Toolkit Message File
PGS_25751		PGS_message/sarb	Toolkit Message File
SARBIOUTIL_25750.t		smf/sarb	Toolkit Message File
PGS_25750		PGS_message/sarb	Toolkit Message File
SSFAAOT_25727.t		smf/sarb	Toolkit Message File
PGS_25727		PGS_message/sarb	Toolkit Message File
PGS_SFCALBCALC_25707.t	ASCII	smf/sarb	Toolkit Message File
PGS_25707 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_SFCALBINGEST_25708.t	ASCII	smf/sarb	Toolkit Message File
PGS_25708 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_DERIVLOAD_25709.t	ASCII	smf/sarb	Toolkit Message File
PGS_25709 ¹	ASCII	PGS_message/sarb	Toolkit Message File
PGS_WRAPSARB_25710.t	ASCII	smf/sarb	Toolkit Message File

Table C.2-3. Status Message Files (SMF)

File Name	Format	Directory	Description
PGS_25710 ¹	ASCII	PGS_message/sarb	Toolkit Message File
postproc_mod_26513.t	ASCII	smf/sarb	Toolkit Message File
PGS_26513	ASCII	PGS_message/sarb	Toolkit Message File

¹These files will be generated on execution of Subsystem software and are not included in the tar file.

C.3 Ancillary Input Data

Table C.3-1. Ancillary Input Data

File Name	Format	Description	Static/Dynamic
SS5_DrivTab_19990315	Binary	Derivative tables	Static
IGBP_Ver3.0	Binary	IGBP map	Static
SigTab_Instantaneous_20040625	ASCII	Sigma tables	Static
ControlFile_20040625	ASCII	Control parameters for CER5.1P1	Static
CollinsAer_1998TRMM_Ver3.0	Binary	Collins-based assimilated aerosol climatology	Static
SS5_HuCoxMunk_OcnAlb	Binary	Coefficients for Hu-Cox-Munk surface albedo over ocean retrieval	Static
SS5_ZJin_OcnAlb_20031101	Binary	Coefficients for Zhonghai Jin surface albedo over ocean retrieval	Static
SS5_GFDLAerClim_200006	Binary	Geophysical Fluid Dynamics Laboratory (GFDL) Aerosol climatology	Static
flsa0404_lut.2s.coef	Binary	Surface Albedo look up table for Fu-Liou model	Static
flsa3_lut.4s.coef_19991215	Binary	Surface Albedo look up table for Fu-Liou model	Static

Table C.3-1. Ancillary Input Data

File Name	Format	Description	Static/Dynamic
flsa200508c.fubin.tab	Binary	Binary Look-Up-Table file of broadband surface albedos including dependencies for sun angle, cloud fraction and properties	Static
flsa4_lut.2s.coef_19991215	Binary	Surface Albedo look up table for Fu-Liou model	Static
MATCH_TERRA_AOTS_MODIS.yyyymmdd (in match_aot/match_aots_yyyymm/)	Binary	Match aerosol data for Terra processing	Static
MATCH_TERRA_AOTS_CLIM_MODIS.mm (in match_aot)	Binary	Match climatology aerosol data for Terra processing	Static
MATCH_TERRA_VERTS_MODIS.yyyymmdd (in match_vert/match_verts_yyyymm)	Binary	Vertical profile Match aerosol data for Terra processing	Static

C.4 Output Temporary Data Files (Production Results)

Table C.4-1. Output Temporary Data Files

File Name	Format	Description
CER5.1P1_PCFin_TRMM-PFM-VIRS_SSIT_999999.1998050100 ¹	ASCII	ASCII file created by the ASCII file generator to be used to produce PCF generator used by both the Main-Processor and the HDF Post-Processor for the Full-Hour Mode.
CER5.1P1_PCFin_TRMM-PFM-VIRS_SubsetSSIT_999999.1998050101 ¹	ASCII	ASCII file created by the ASCII file generator to be used to produce PCF generator used by both the Main-Processor and the HDF Post-Processor for the Subset Mode.
CER5.3P1_PCFin_TRMM-PFM-VIRS_SSIT-New_999999.19980501 ¹	ASCII	ASCII file created by the ASCII file generator to be used to produce PCF generator used by the HDF Post-Processor.
CER5.0P1_PCFin_TRMM-PFM-VIRS_SSIT-Monthly_999999.199805 ¹	ASCII	ASCII file created by the ASCII file generator to be used to produce PCF generator used by the Surface Albedo Monthly Pre-Processor.

Table C.4-1. Output Temporary Data Files

File Name	Format	Description
CER5.4P1_PCFin_TRMM-PFM-VIRS_SSIT-Monthly_999999.199805 ¹	ASCII	ASCII file created by the ASCII file generator to be used to produce PCF generator used by the Monthly QC Processor.

¹These files will be generated on execution of Subsystem software and are not included in the tar file.

C.5 SSF HDF Read Software

Table C.5-1. CRS HDF Read Software Files

File Name	Format	Description
CRS_readhdf_daacv3.c	ASCII	Main program which accesses the HDF reading functions
CRS_readHDFfuncs_daacv3.c	ASCII	C functions that are linked with 'readhdf.c' and calls the HDF functions
CRS_HDFread_daacv3.h	ASCII	Header file for 'readhdf.c' and the HDF libraries
compile_CRS_readhdf_daacv3	ASCII	Script to compile the C programs in a UNIX environment. The script must be modified for different platforms to properly compile the programs and correctly link the HDF libraries
CRS_README	ASCII	Informational file