

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

**Data Management System  
(DMS)**

**Configuration Management Plan  
Version 8**

**for**

**TRMM, Terra, Aqua, and NPP**

**April 2012**

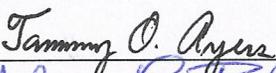
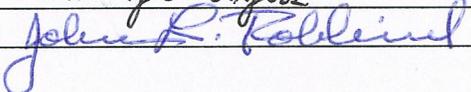
# Clouds and the Earth's Radiant Energy System (CERES)

## Data Management System

### Stakeholder-Commitment Sheet for the CERES Configuration Management Plan

This Stakeholder-Commitment Sheet is to demonstrate that the relevant stakeholders as identified in the CERES Data Management Plan are aware of and support the CERES processes described in the CERES Configuration Management Plan.

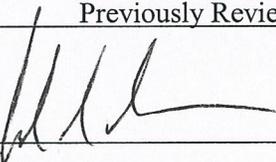
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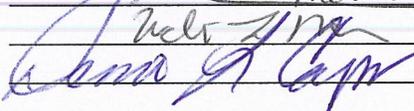
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## Document Revision Record

The Document Revision Record contains information pertaining to approved document changes. The table lists the Version Number, the date of the last revision, a short description of the revision, and the revised sections. The document authors are listed on the cover.

### Document Revision Record

<b>Version Number</b>	<b>Date</b>	<b>Description of Revision</b>	<b>Section(s) Affected</b>
V1	01/1998	<ul style="list-style-type: none"> <li>• Initial version of CERES Configuration Management Plan.</li> <li>• Updated format to comply with standards.</li> </ul>	All All
V2	10/16/2005	<ul style="list-style-type: none"> <li>• Added CM audit information.</li> <li>• Updated format to comply with standards.</li> </ul>	1.7 All
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V6	03/02/2009	<ul style="list-style-type: none"> <li>• Removed references to SAIC or other specific contractor, except in the Document Revision Record where it will be maintained for the historical record.</li> <li>• Modified cover page to follow new standard.</li> <li>• Included updated Stakeholder-Commitment Sheet reflecting new staff.</li> <li>• Modified Preface to follow new standard.</li> <li>• Included new Acknowledgements page.</li> </ul>	All  Cover Page Stakeholder-Commitment Sheet Preface Acknowledgements page

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V6	03/02/2009 (Continued)	<ul style="list-style-type: none"> <li>• Modified Introduction to follow new standard.</li> </ul>	Introduction
V7	07/07/09	<ul style="list-style-type: none"> <li>• Modified wording to further explain the SCCR approval/disapproval process.</li> <li>• Modified table.</li> </ul>	Sec. 2.1.1  Table 1-1
V8	04/19/2012	<ul style="list-style-type: none"> <li>• Completed Annual Review.</li> <li>• Updated Cover.</li> <li>• Updated Introduction.</li> <li>• Made corrections as necessary.</li> </ul>	All Cover Page Introduction Secs. 1.2, 1.3, Table 1-1, Sec. 2.0, Figures 2-1, 2-2, Secs. 2.1.3, 2.5, 3.0, 4.0, Appendices A, B, & C

## **Preface**

The CERES DMS supports the data processing needs of the CERES Science Team to increase understanding of the Earth's climate and radiant environment. The CERES DMT works with the CERES Science Team to develop the software necessary to support the science algorithms. This software, being developed to operate at the Langley ASDC, produces an extensive set of science data products. The DMS consists of 12 subsystems each of which contains one or more PGEs.

The purpose of the Configuration Management Plan is to provide specific guidance on the overall plan for the configuration management of CERES computer files containing software, required data for the CERES data processing, and documentation, all associated with deliveries of the CERES software to the ASDC. The Software Development Plan provides specific guidance and definition of the Software Development Process used by the CERES DMT.

The CERES Data Management Plan provides overall guidance to the CERES DMT.

## Acknowledgements

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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  $\mu\text{m}$ ), a total channel (0.3 - 200  $\mu\text{m}$ ), and an infrared window channel (8 - 12  $\mu\text{m}$ ). 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 CERES CM Plan

The CERES CM Plan discusses the overall plan for the configuration management of the CERES CIs as defined in Section 1.2. CERES CM will provide a user-friendly system to assist users in implementing procedures to perform tasks associated with CERES CM. The procedures explained in this document are based on the current experience of the CERES CM Team. As new situations arise or the system is improved, these procedures will be modified accordingly.

All acronyms used in this document are defined in [Appendix A](#). They are not defined in the text.

This document is organized as follows:

Section [1.0](#) - Introduction

Section [2.0](#) - CERES CM Process

Section [3.0](#) - CERES CM System Home Page - Information Resources and Tools

Section [4.0](#) - Delivery Schedules

[Appendix A](#) - Acronyms

[Appendix B](#) - CERES Subsystem Delivery Procedures

[Appendix C](#) - CM Testing Procedures

## 1.2 CERES CM System

The CERES DMT is developing a DMS to process data from the CERES instruments and produce science data products which will be archived as part of the EOS program. The job of the CERES CM system is to manage CERES computer files containing software, required data for CERES data processing, and documentation all associated with deliveries of the CERES software to the ASDC. These computer files that are under the control of the CERES CM system are referred to as CIs in this document. The management of CERES CIs includes receiving the delivery of CIs from the individual subsystems, moving CIs to the ASDC production environment, testing the CIs as appropriate according to the Test Plan provided by the subsystem, releasing CIs to the ASDC SIT Team, storing CIs, and controlling the configuration of the CERES DMS by overseeing changes and ensuring that they are properly authorized and maintained. The CERES CM system is implemented on the SCF. In this document, CM Server refers to the *AMI* computer system at the ASDC which is part of the SCF.

The configuration control of other CERES DMS documentation as listed in Section 8.1 of the Data Management Plan (see Reference 1) is managed by the CERES Documentation Team.

## 1.3 CERES CM Organization

The CERES DMT is composed of personnel from NASA Langley's Science Directorate and contractors who support the CERES project.

The CERES CM Team is a small group (typically three or less) of analysts who are members of the CERES DMT. The CM Team provides procedures for implementing and implements the CERES CM Plan.

The CERES CCB is comprised of all members of the CERES DMT. The DMT Lead serves as the CCB Chairperson and, as such, leads a discussion on all new and open SCCRs during the biweekly CPOB meetings. CCB members that are in attendance at the CPOB meeting may offer advice to the CCB chairperson, but it is the CCB chairperson that is the decision making authority concerning CERES CIs.

## 1.4 CM Definitions

### 1.4.1 Configuration Control

Configuration control for CERES is the systematic process of maintaining and tracking the life cycle of a CI. It includes the procedures that are established for requesting and submitting a change to a CI, and it allows for the retrieval of a CI at any time during its life cycle.

### 1.4.2 Configuration Identification

The name and version number of a particular CERES CI establishes a specific configuration identification for that CI. Each CERES CI has a unique filename or configuration identification. [Table 1-1](#) contains a list of CERES CIs and their associated configuration identification. In the table elements of the configuration identifications are defined. The Release Number, R#, defines

which mission is associated with the CI, i.e., 1, pre-launch development; 2, TRMM; 3, Terra; 4, Aqua.

Table 1-1. CI Tracking

CI	Configuration Identification
Requirements Log (Excel)	SS_req_log_V##.xls
Preliminary Delivery Memo (Word or PDF)	SS_pre_del_memo_R#-SCCR.(doc) or (pdf)
Final Delivery Memo (Word or PDF)	SS_del_memo_R#-SCCR.(doc) or (pdf)
Test Plan (Word or PDF)	SS_test_plan_R#V##-SCCR.(doc) or (pdf)
Operator's Manual (Word or PDF)	SS_opman_R#V##-SCCR.(doc) or (pdf)
Compressed Ancillary Data Tar File	SS_anc_R#-SCCR.tar.Z
Ancillary Data List File	SS_anc_R#-SCCR.list
Compressed Source Code Tar File	SS_src_R#-SCCR.tar.Z
Source Code List File	SS_src_R#-SCCR.list
Compressed Other Data Tar File	SS_data_R#-SCCR.tar.Z
Other Data List File	SS_data_R#-SCCR.list
Data Products Catalog section (Word or PDF)	DPC_PROD_R#V#.(doc) or (pdf)
Collection Guide (Word or PDF)	PROD_CG_R#V#.(doc) or (pdf)

**Key**

- SS** - instrument, erbelike, clouds, inversion, InstSARB, TISAgrid, TISAavg, SynSARB, ggeo, RegridMOA, CERESlib
- R#** - Release number (example, Release 5 is represented by R5)
- V##** - Version number (example, Version 2 is represented by V2)
- PROD** - BDS, ES8, ES9, ES4, SSF, CRS, FSW, SFC, ISCCP-D2like-Day/Nit, SYN, AVG, ZAVG, SRBAVG, ISCCP-D2like-GEO, INSTR, IES, EID-6, CRH, SYNI, GGEO, TSI, MOA, CID\_VIRS, CID\_MODIS, CID\_VIIRS, SURFMAP, GEO, APD, GAP, MWH, OPD

**1.4.3 Baselines**

A baseline is a configuration identification that is associated with a specific time in a CIs life cycle. CM maintains a baseline for each subsystem delivery. During CERES software development (see Reference 2) updates are made to the subsystems baselines. Following the updates the software version that successfully passes all subsystem, CM, and ASDC testing and has been promoted to the operational production environment becomes the starting baseline for the next delivery. This baseline is stored in the CM repository.

**1.5 CERES CM Responsibilities**

It is the responsibility of the CERES CM Team to design and implement a CM system that provides the level of configuration management that is appropriate for the CERES project. The CERES CM System provides procedures for accepting, moving, testing, releasing, storing, and controlling CERES CIs and their updates. These procedures are described in Section 2.1 through Section 2.6 of this document.

The CERES CM Team is responsible for establishing baselines for the CERES CIs and

maintaining updates to these baselines (see Section 2.6). Configuration control and configuration identification is also the responsibility of the CERES CM Team.

### **1.6 CERES CM Audits**

During CM Testing the successful compilation of the software and execution of the test cases from the subsystem Test Plan acts as a configuration audit of the delivered files to demonstrate that the integrity of the configuration baseline is being maintained.

## 2.0 CERES CM Process

The CERES CM Team manages CIs for each of the following CERES subsystems that fall under the domain of the CERES CM System.

<u>Subsystem Number</u>	<u>Subsystem Name</u>
1.0	Instrument
2.0 & 3.0	ERBE-like
4.1 - 4.4	Clouds
4.5 & 4.6	Inversion
5.0	Instantaneous SARB
6.0 & 9.0	TISA Gridding
7.1, 8.0, & 10.0	TISA Averaging
7.2	Synoptic SARB
11.0	GGEO
12.0	MOA
CERESlib	CERES Library
Perl_Lib	Perl Library

There are procedures in place to ensure that each CI managed by the CERES CM System is properly introduced into the system, relocated as required to the Langley ASDC and to the appropriate CM storage location, and that updates to the CIs are controlled and records of these updates maintained. More specifically, there are six currently supported CM functions.

1. Receive CI from Subsystem
2. Move CI to the ASDC
3. Test CI in the production environment
4. Release CI to the ASDC
5. Store CI in CM storage repository

## 6. Control and maintain records of updates to CI

The CM procedures used to help implement the six CM functions are described below in Section 2.1 through Section 2.6.

The CERES subsystem and coefficients delivery schedules are available on the Web through the CM Home page. Section 4.0 contains more information on schedules.

In addition to these scheduled deliveries, there will, of course, be unscheduled deliveries that must be made to correct or update CIs that have previously been delivered. These unscheduled deliveries are made when circumstances dictate.

The scheduled deliveries are somewhat more systematic. Over a three-week period the following activities take place.

3 weeks before the ASDC delivery date

The preliminary *Delivery Memo* is sent from the responsible subsystem to CM. An SCCR must be submitted before CM will accept the preliminary *Delivery Memo* (see Section 2.1.1 for SCCR information).

CM forwards the preliminary *Delivery Memo* to the ASDC.

1 week before the ASDC delivery date

The subsystem emails the Test Plan and/or Operator's Manual associated with this delivery if updates were necessary to the Documentation Team.

The subsystem delivers the final *Delivery Memo* and the *Delivery Package* containing the CIs to CM.

The week of the ASDC delivery

The finalized *Test Plan* is delivered by Documentation to CM. Using the finalized Test Plan, CM tests the delivered software.

CM delivers the *Delivery Package* and associated documentation to the ASDC SIT Team.

The CM procedures used to perform the six CM functions are described below in Section 2.1 through Section 2.6.

### 2.1 Receive CI from Subsystem

This is the first of the six functions performed by the CM Team that make up the CERES CM process as discussed in the previous section. This function is composed of the following three steps;

- SCCRs must be submitted prior to a software delivery. Section 2.1.1 describes the submission through approval process for SCCRs.
- A preliminary Delivery Memo must be completed and submitted prior to a software delivery as described in Section 2.1.2.
- CIs are actually received as a result of the subsystem teams using cm\_move.csh as described in Section 2.1.3.

Subsystem personnel should follow the CERES Subsystem Delivery Procedures (see [Appendix B](#)) which describes in more detail all of the steps in this section.

### 2.1.1 SCCR

Regarding SCCRs, these are the steps that must be taken prior to a CI being received by CERES CM for delivery to the ASDC. See the CERES CM SCCR Help Page ([http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl?page=ccr\\_help](http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl?page=ccr_help)) for more information on completing an SCCR.

The DMT Lead serves as the CCB Chairperson and is the approval authority for SCCRs. The DMT Lead has authorized the CM Team Lead or a specified back up to designate the SCCR as approved or disapproved using the CERES CM on-line tool.

1. An SCCR is completed and submitted using the on-line SCCR form (<http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl?option=create>). An email is automatically sent by the CERES CM on-line tool to the CERES CM Team, the ASDC SIT Team, the DMT, and appropriate Science Team members, notifying them that an SCCR has been submitted and listing the contents of the SCCR in the email for their review.
2. The CERES CM Team presents the SCCR to the CCB for approval. If the SCCR is disapproved, the CI change process terminates, and the SCCR is designated as disapproved. An email stating that the SCCR has been disapproved is automatically sent by the CERES CM on-line tool to the CERES CM Team, the ASDC SIT Team, and the DMT.
3. If the SCCR is approved, the SCCR is designated as approved, an email announcing the approval is automatically sent by the CERES CM on-line tool to the CERES CM Team, the DMT, and the ASDC SIT Team, and the changes requested on the SCCR can be made to the appropriate CIs by the appropriate software developer. This email sent by the on-line tool serves as the official CERES communication that the SCCR has been approved by the CCB Chairperson.

See [Figure 2-1](#) for more information on the SCCR process.

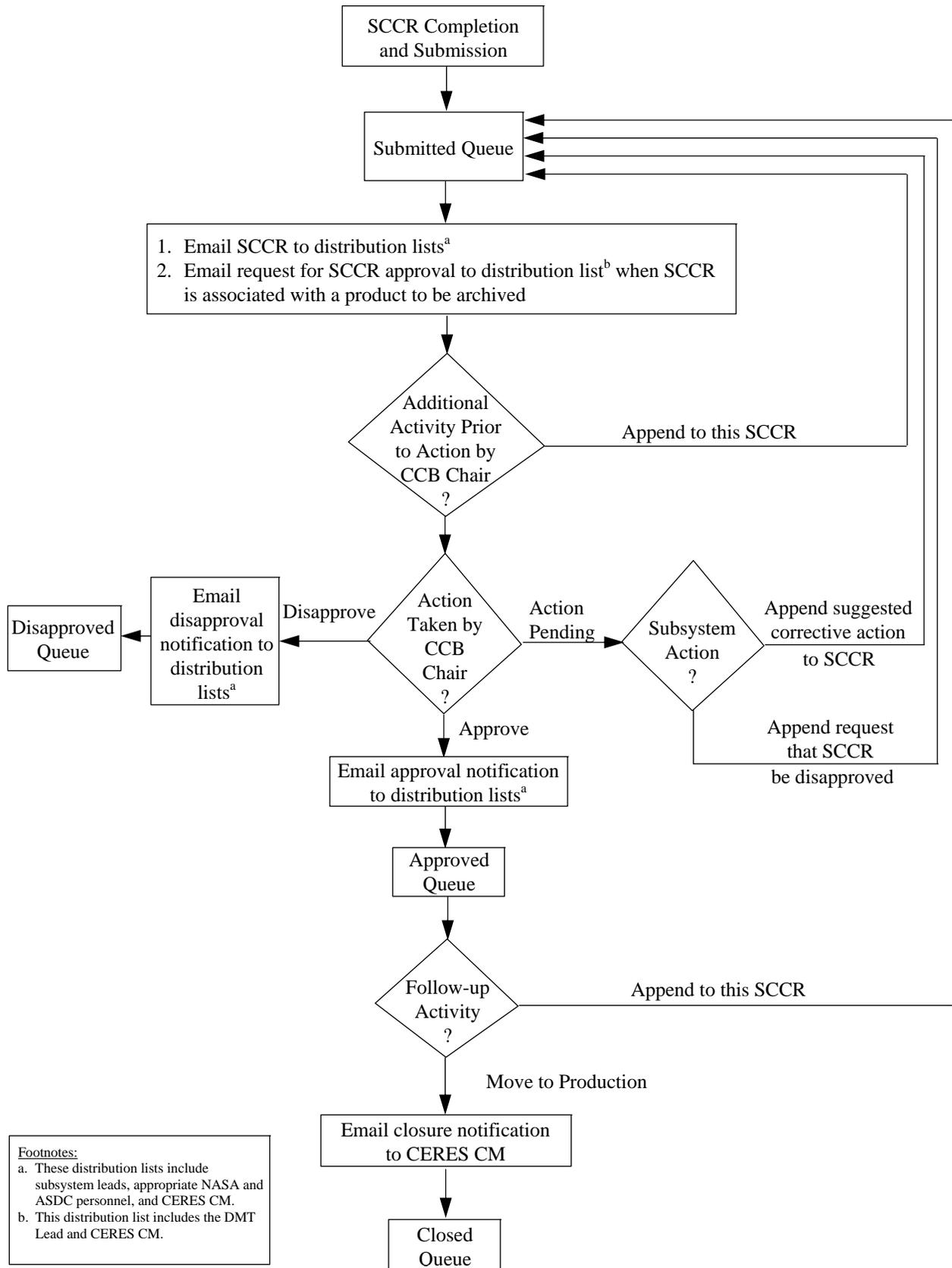


Figure 2-1. SCCR Process

### 2.1.2 Preliminary Delivery Memo

About 3 weeks before the delivery of a CI is due to the ASDC, the responsible subsystem team creates a Delivery Memo based on the template available on the CERES CM Web site (<http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl>) and sends it to CM ([larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov)) as an email attachment. After reviewing the memo for accuracy, CM forwards the preliminary *Delivery Memo* to the ASDC. The memos are stored on individual workstations that are routinely backed up and are only accessible to the CERES CM Team.

### 2.1.3 Moving CIs into the CERES CM system (cm\_move.csh)

The next step is to move the CIs contained in a delivery package into the CERES CM system. An understanding of the CERES CM directory structure will be useful in following the movement of the subsystem CIs once they are entered into the CERES CM system. [Figure 2-2](#) shows the CERES CM directory structure on the CM Server.

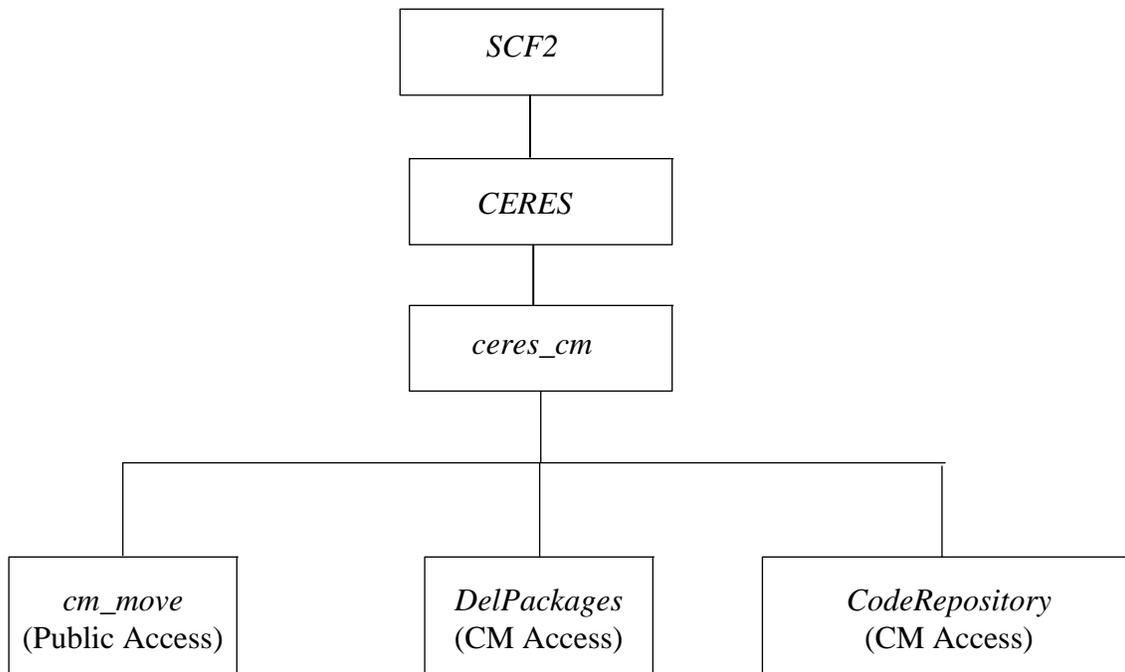


Figure 2-2. CM Directory Structure on the CM Server

The five categories of deliveries a subsystem can make to CERES CM are described in [Table 2-1](#).

Table 2-1. Delivery Categories

Delivery Category	Description of Delivery Package	Required Documentation
Full Subsystem	Includes all PGEs with associated source, scripts, ancillary, input, and expected output data files that comprise the complete subsystem delivery.	Preliminary and final Delivery Memos and, if applicable, updated Test Plan and Operator's Manual.
PGE(s) Specific	Includes all files necessary for the PGE(s) being delivered.	Preliminary and final Delivery Memos and, if applicable, updated Test Plan and Operator's Manual.
Delta	Includes only scripts and/or data files.	Preliminary and final Delivery Memos and, if applicable, updated Test Plan and Operator's Manual.
Coefficient	Includes only instrument gain, spectral response function, S'COOL data, GGEO coefficient, or other types of files that need to be periodically delivered.	No formal documentation required.
Sample Read Package	Includes any updates necessary to support reading an output data product whose format was changed.	DPC pages for which the subsystem team is responsible.

The Sample Read Package is provided to the ASDC User Services and is distributed to a user when a CERES data product is ordered from the ASDC. Guidelines on the content to be included in the Sample Read Package are defined by the ASDC User Services.

The cm\_move script was prepared by CERES CM for subsystem teams to use to deliver CIs (source code, ancillary data, and other data) to CM for Full Subsystem, PGE(s) Specific, and Delta deliveries. These CIs are included in tar files by the subsystem teams as detailed in the CERES Subsystem Delivery Procedures (see [Appendix B](#)) prior to invoking the cm\_move script. In addition, the subsystem teams also use cm\_move for Coefficient and Sample Read Package deliveries. As a result of the subsystem team invoking the cm\_move script, these CIs are initially stored in the cm\_move directory as described in [Figure 2-2](#) and an email is automatically sent to the CM Team notifying them that the cm\_move has been performed. A Unix cron job runs hourly and moves the files from the cm\_move directory to the DelPackages directory. Once in the DelPackages directory, it also changes the file permissions and ownership so that only members of the CM Team have write permission.

If the subsystem Test Plan and/or Operator's Manual were updated for a delivery, those CIs are delivered to the CERES Documentation Team ([larc-ceresdoc@lists.nasa.gov](mailto:larc-ceresdoc@lists.nasa.gov)) as Word file attachments in an email from the subsystem team. These document files are stored permanently in the document repository.

The subsystem team creates the final Delivery Memo from the preliminary Delivery Memo and sends it to CM ([larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov)) as an email attachment. These files are stored on individual workstations that are routinely backed up and are only accessible to the CERES CM Team.

## 2.2 Move CI to the ASDC

Once the delivered tar files are in the DelPackages directory on the CM Server, the CM Team moves the CIs to the /SPG\_ops/delivery/CERES/incoming directory in the ASDC production environment using ftp. The associated subsystem documentation (Test Plan, Operator's Manual) is moved to the ASDC production environment after the files have been reviewed and standardized by the Documentation Team.

## 2.3 Test CI

The CM Team compiles and tests the delivered software according to the instructions in the subsystem Test Plan. This ensures that all of the necessary files for this baseline were delivered and that the testing results created in the ASDC production environment are scientifically equivalent to what the subsystem team produced at the SCF. As a delta delivery is comprised of only scripts and/or data files, the CM Team only tests a delta delivery if the subsystem team requests it. The operational testing performed on a delta delivery by the ASDC SIT Team will ensure that the proper files were delivered. The steps followed by the CM Team to perform this function are detailed in the CM Testing Procedures (see [Appendix C](#)). If the CM Team encounters any problems compiling or testing the delivered software, the subsystem team is notified. The subsystem team may need to take one of the following actions: correct the Test Plan, provide modified software or data files as an update to the existing delivery, or cancel the delivery. The CM Team also tracks the defects discovered during CM testing along with the causes of these defects and records the occurrence of defects in TRLs. TRLs are stored by the CERES CM Team on individual, regularly backed-up workstations. CERES CM testing is resumed in the first two cases when the appropriate update is received.

## 2.4 Release CI to the ASDC

After successfully testing the delivered software, it is released to the ASDC for operational testing. The CM Team sends a Release Notification email, including the final Delivery Memo as an attachment, to the ASDC SIT Team. An example Release Notification can be found in the CM Testing Procedures (see [Appendix C](#)).

## 2.5 Move CI to CM storage repository

After the delivered software is promoted to the operational production environment, the ASDC SIT Team sends a Promotion Notification email to the CM Team and appropriate subsystem team. Based on this email, the CM Team closes the SCCR associated with the delivery, creates the final tar files, and stores them in the appropriate subsystem subdirectory in the CodeRepository directory on the CM Server. Once this is done, the original tar files are deleted from the DelPackages directory.

## 2.6 Control and maintain records of updates to CI

Baselines for each release of CERES CIs are established after the CM Team stores the CIs in the appropriate directory on the CM Server as described in the previous section. The approved SCCR for this software delivery is the fundamental record for this baseline. Should further updates to the baseline be required, the appropriate subsystem submits a new SCCR documenting the software modifications, and the process begins again.

### 3.0 CERES CM System Home Page - Information Resources and Tools

The CERES Configuration Management System Home Page is located at <http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl>. On this page are lists of CM related information and software tools. Tools available for managing SCCRs are found along the top of the Web page. These tools are,

- Create SCCR
- View SCCR
- Modify SCCR
- User Registration
- CM Admin – This area is accessible only to members of the CM Team. The tools to approve, disapprove, update, and close an SCCR are found here.

The main section of the **CERES Configuration Management System** contains the following information.

#### General Information

- CM Plan (PDF)
- Lessons Learned
- PGE Sizes
- SEC Presentation (PDF)
- Toolkit Information
- Documentation Guidelines

#### Delivery Information

- CM Schedules
- Subsystem Delivery Procedures (PDF)
- S'COOL Delivery Procedures (PDF)
- CM Naming Conventions
- CERESlib Change Procedures

#### Documentation

- Delivery Memos
- Delivery Memo Sample
- Delivery Memo Template
- Test Plans
- Test Plan Guidelines (PDF)
- Test Plan Sample

**Contacts**

- CM Team
- Documentation Team

#### **4.0 Delivery Schedules**

The CERES DMT Production Coordinator (NASA) meets periodically with the CERES PI to develop data processing priorities for CERES data to be run at the ASDC. In addition, data from SCCRs are used to populate the CERES Subsystem Delivery Schedule and the CERES Coefficients Delivery Schedule as well as the SCCR Dashboard Database from which the SCCR Status-Update Worksheet is generated; this worksheet is a key support document used during the CPOB meetings to track the progress of software deliveries. The schedules contain information regarding the various deliveries such as subsystem making a delivery, when the preliminary delivery memo is due, when the delivery is due to CERES CM, when the delivery is to be released by CERES CM to the ASDC, whether there is an associated CERESlib delivery needed, whether there are new PGEs associated with the delivery, and what the certified platforms are for the delivery.

This schedule information as shown in the previous section can be found on the CERES CM page under Delivery Information.

## References

1. CERES DMS Data Management Plan Version 5 for TRMM, Terra, and Aqua, March 2009, URL: <http://ceres.larc.nasa.gov/docs.php>
2. CERES DMS Software Development Plan Version 5 for TRMM, Terra, and Aqua, March 2009, URL: <http://ceres.larc.nasa.gov/docs.php>

## Appendix A Abbreviations and Acronyms

<i>AMI</i>	ASDC Modernization through Integration
ASDC	Atmospheric Sciences Data Center
CCB	Configuration Control Board
CERES	Clouds and the Earth's Radiant Energy System
CI	Configuration Item
CM	Configuration Management
DMS	Data Management System
DMT	Data Management Team
DPC	Data Products Catalog
EOS	Earth Observing System
ERBE	Earth Radiation Budget Experiment
FM	Flight Model
FTP	File Transfer Protocol
GGEO	Gridded Geostationary Narrowband Radiances
MOA	Meteorological, Ozone, and Aerosols (data product)
NASA	National Aeronautics and Space Administration
NPP	National Polar-orbiting Operational Environmental Satellite System (NPOESS) Preparatory Project
PDF	Portable Document Format
PGE	Product Generation Executive
PI	Principal Investigator
SARB	Surface and Atmospheric Radiation Budget
SCCR	Software Configuration Change Request
SCF	Science Computing Facility
S'COOL	Students' Cloud Observations On-Line
SEC	System Engineering Committee
SGI	Silicon Graphics Incorporated
SIT	Software Integration and Testing
SSI&T	Science Software Integration and Test
SW	Shortwave
TISA	Time Interpolation and Space Averaging
TOT	Total
TRL	Test Results Log

TRMM      Tropical Rainfall Measuring Mission  
URL        Universal Resource Locator

## Appendix B CERES Subsystem Delivery Procedures

1. Review CERES Subsystem Delivery Schedule (<http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl?page=schedules>) when the announcement that the schedule has been updated is received. The current schedule is at the top of the list on the Web page.
2. A Software Configuration Change Request (SCCR) should be submitted when you expect or are planning to make changes to your subsystem's software configuration. At the very latest an SCCR must be submitted prior to submitting a preliminary Delivery Memo to CERES CM (CERESlib may be an exception).
3. Prepare and send a preliminary Delivery Memo (Word version) to CERES CM ([larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov)) as scheduled (see [Table B-1](#)). All sections of the Delivery Memo should be completed except D.3.b. Estimate the file sizes for Section C. If you have any questions about how to fill out the Delivery Memo please contact CERES CM. If your Delivery Memo is not in the current format, download the CERES Delivery Memo Template from the CERES CM home page (<http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl>). A sample Delivery Memo is also available on the CERES CM home page.
4. Test Plans and Operator's Manuals only need to be delivered if they have been updated since the last time they were delivered. If changes need to be made to these documents, download the Word file for the document from the Web. Go to the CERES On-Line Documentation page (<http://ceres.larc.nasa.gov/docs.php>) and select the type of document that needs to be updated. Then select the appropriate document from the specific document Web page.

Before you make any changes to your document make sure Track Changes is turned on. You must also select Track Changes from the Options menu and set Insertions to Underline and Deletions to Strikethrough. All of these must be set each time in each document before you make any modifications in order for the final version of your document to have the changes documented.

5. Ensure that the correct output file names are included in and are consistent between the Test Plan and Operator's Manual and that these names accurately reflect the names of the output files that are created by the software.
6. Test Plan Instructions
  - When the code is tested prior to delivery, be sure to use the Test Plan that you intend to send to CERES CM. Once you've completed testing do not change the Test Plan.
  - Be sure that the execution time stated in the Test Plan for each test is accurate as tested on the target platform.

- Be sure to include the output file names for the test case(s) either in the Test Plan or in a file included in the delivery package. If the file names are listed in a file, make sure the file is referred to by name in the Test Plan in the appropriate place (i.e., after the output files are created).
  - Instructions for how and when to execute the clean-up script(s) should be in the Test Plan.
  - List the names of executables created by the compilation instructions.
7. Send Word versions of the Test Plan and Operator's Manual as e-mail attachments to [larc-ceresdoc@lists.nasa.gov](mailto:larc-ceresdoc@lists.nasa.gov). See [Table B-1](#) for information on how the files should be named. If formatting assistance is needed for either the Test Plan or Operator's Manual, please send the document with instructions to [larc-ceresdoc@lists.nasa.gov](mailto:larc-ceresdoc@lists.nasa.gov) or talk to one of the members of the CERES Documentation Team.
  8. Send the Operator's Manual as soon as possible (at least a week or two before delivering to CERES CM). This will shorten operational testing time since the ASDC uses information from the Operator's Manual to write and update scripts used during testing. If information in the Operator's Manual is inaccurate, the testing time will increase.
  9. Clean-up script(s) for test cases which remove the files created by executing the Test Plan commands should be included in the delivery package.
  10. Clean-up script(s) which remove files created during production runs should be included in the delivery package and information on the use of these scripts should be in the Operator's Manual.
  11. Print exit codes to the screen.
  12. Don't deliver object code or executables.
  13. Don't deliver the smf.log file.
  14. Test and create expected output on the target platform. Get an account on the target platform if you don't already have one.
  15. Don't deliver input data for your test cases in other subsystem directories. Include the files somewhere in your subsystem directory structure (e.g., the input directory) and include instructions in the Test Plan for copying (not moving) these files to the appropriate directory (i.e., the directory where the subsystem generating the input data as output data puts the files). Note: Try to provide CERES CM at least 24 hours advance notice if you plan to use input data from archives to create your expected output to ensure the data are staged in the production area before you begin testing. The use of this data also needs to be described in the Test Plan.
  16. Tar File Instructions
    - In general, there will be 3 tar files provided with each delivery: source, ancillary data, and all other data (see [Table B-1](#)).

- Tar files should be created by the subsystem from the **working group level** (/ENG/CERES/sarb/testing/**sarb/...**) and should include all of the directories from the directory structure established by the Langley ASDC whether or not they contain any files.
- Remove extraneous files/directories before creating tar files.
- Tar files should not exceed 1 GB.
- Before compressing tar files do “tar -tvf” to create the list file that will be delivered along with each tar file. The list file contains a list of the contents of the tar file.  
Example: tar -tvf instrument\_src\_R3-237.tar > instrument\_src\_R3-237.list
- Use the UNIX “compress” command to compress the tar files.

17. Make the subsystem delivery on or before the scheduled “Delivery to CERES CM” date according to the latest CERES Subsystem Delivery Schedule (<http://earth-www.larc.nasa.gov/cgi-bin/cgiwrap/cerescm/mysql/cerescm.pl?page=schedules>). If you can’t do this, send e-mail to [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov) as soon as possible.
18. Deliver tar files and tar file listings to CERES CM by using the cm\_move.csh script found in /SCF2/CERES/ceres\_cm/cm\_bin on AMI. For example,  
/SCF2/CERES/ceres\_cm/cm\_bin/cm\_move.csh <tar\_file\_name.tar.Z> <tar\_file\_name.list>
1. Send the Word version of the final Delivery Memo to [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov) (see [Table B-1](#)). All sections should be completed except D.3.b and PDF file sizes.

Table B-1. File Naming Conventions

File	File Name
Preliminary Delivery Memo (Word)	SS_pre_del_memo_R#-SCCR.doc
Final Delivery Memo (Word)	SS_del_memo_R#-SCCR.doc
Preliminary Delivery Memo (PDF)	SS_pre_del_memo_R#-SCCR.pdf
Final Delivery Memo (PDF)	SS_del_memo_R#-SCCR.pdf
Test Plan (Word)	SS_test_plan_R#V##-SCCR.doc
Operator’s Manual (Word)	SS_opman_R#V##-SCCR.doc
Test Plan (PDF)	SS_test_plan_R#V##-SCCR.pdf
Operator’s Manual (PDF)	SS_opman_R#V##-SCCR.pdf
Compressed Ancillary Data Tar File	SS_anc_R#-SCCR.tar.Z
Ancillary Data List File	SS_anc_R#-SCCR.list
Compressed Source Code Tar File	SS_src_R#-SCCR.tar.Z
Source Code List File	SS_src_R#-SCCR.list

Table B-1. File Naming Conventions

File	File Name
Compressed Other Data Tar File	<b>SS_data_R#-SCCR.tar.Z</b>
Other Data List File	<b>SS_data_R#-SCCR.list</b>
Requirements Log (Excel)	<b>SS_req_log_V##.xls</b>

**Key**

- SS** - instrument, erbelike, clouds, inversion, InstSARB, TISAgrid, TISAavg, SynSARB, ggeo, RegridMOA, CERESlib
- R#** - Release number (example, Release 5 is represented by R5)
- V##** - Version number (example, Version 2 is represented by V2)

## Appendix C CM Testing Procedures

(In the examples, the Clouds Subsystem with SCCR # 421 is being used.)

When a pre-delivery memo is received verify the date the software is being delivered to CM is correct and that there is something written in Section G which explains the updates to the code. Also, make sure the correct PGEs are listed for the delivery, particularly if it is less than a full subsystem delivery. Check the correctness of the memo in general, including the Word file name, and run the spelling checker. Create a PDF version of the memo. Send email to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov) with a carbon copy to [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov), with the subject of “Clouds Preliminary Delivery Memo (SCCR nnn)” where nnn is the SCCR number. Include the PDF version of the pre-delivery memo as an attachment.

Preliminary Delivery Memo email example:

Attached is a PDF version of the preliminary Delivery Memo for Clouds (Subsystems 4.1-4.4).

Thanks,  
Tammy

Code delivered by the Subsystems is placed on *AMI* in `/SCF2/CERES/ceres_cm/cm_move` by the `cm_move.csh` script. At 10 minutes past each hour, a cron job executes and moves all files from the `cm_move` directory to `/SCF2/CERES/ceres_cm/DelPackages` - for access only by CM personnel.

Log onto the target platform and set up the CERES environment based on the compiler listed in the Subsystem’s Test Plan. The environment is set up by sourcing the CERES environment script in the home directory.

Note: Be sure that `umask` and `group` are set correctly. The command “`umask 002`” can either be added to your `.cshrc` file or typed on the command line.

FTP the files from *AMI* to the target platform.

On *AMI*:

- `cd /SCF2/CERES/ceres_cm/DelPackages` (or `/SCF2/CERES/ceres_cm/cm_move`, if the cron job has not moved the files to `DelPackages` yet)
- `sftp` to the target platform
- `> cd /SPG_ops/delivery/CERES/incoming`
- `> mput clouds*421*` (put the files delivered by the subsystem - use SCCR # in name)
- `> quit`

Verify that the files were copied correctly by checking the file sizes on the two computers. No error is given if there was a problem with the FTP process.

Before uncompressing and untarring the files, vi the .list files and look through them for any files that obviously shouldn't have been delivered. Search specifically for .tar, .exe, and .o files. TISA Averaging is allowed to have .exe files in their Web directory. If there are files that shouldn't have been delivered, check with the Subsystem personnel and then delete the files from the .list file and also from the directory after untarring the tar file. If a lot of incorrect files are delivered then ask the Subsystem to correct the tar file and redeliver it.

If the tar files are not too big then copy them to /SPG\_ops/verify/CERES, and uncompress and untar them there. However, if the tar files are large (maybe TISA Gridding and TISA Averaging), they can't be untarred in the /SPG\_ops/verify/CERES directory, so they should be uncompress in the /SPG\_ops/delivery/CERES/incoming directory, then untarred directly into the /SPG\_ops/SSIT/CERES directory. First:

- cd /SPG\_ops/SSIT/CERES

Then, repeat the following commands for each compressed tar file:

- uncompress /SPG\_ops/delivery/CERES/incoming/file.tar.Z
- chmod 664 /SPG\_ops/delivery/CERES/incoming/file.tar
- tar xvf /SPG\_ops/delivery/CERES/incoming/file.tar
- compress /SPG\_ops/delivery/CERES/incoming/file.tar

Change directories to the \$CERESHOME directory for SSI&T:

- cd /SPG\_ops/SSIT/CERES
- or
- cd \$CERESHOME

For CERESlib deliveries, remove the files in the /SPG\_ops/SSIT/CERES/lib\_old directory and put the current files that are in /lib into the /lib\_old directory using the following commands:

- rm -rf /SPG\_ops/SSIT/CERES/lib\_old
- mv /SPG\_ops/SSIT/CERES/lib /SPG\_ops/SSIT/CERES/lib\_old

If the delivery is a full subsystem delivery then the files from the previous delivery need to be removed from the SSI&T directory. For example,

- rm -rf /SPG\_ops/SSIT/CERES/clouds (except /SPG\_ops/SSIT/CERES/sarb)

If the delivery is a PGE delivery or a delta delivery then the files from the previous delivery are not removed.

Copy the files from /SPG\_ops/verify/CERES to /SPG\_ops/SSIT/CERES:

- `cp -R /SPG_ops/verify/CERES/clouds .`

If the delivery is a full subsystem delivery then run the `cm_stats.csh` script in /SPG\_ops/SSIT/CERES/ceres\_cm before compiling and testing the code.

If no new Test Plan was delivered, download the latest version from the CERES Test Plan Web page ([http://ceres.larc.nasa.gov/test\\_plans.php](http://ceres.larc.nasa.gov/test_plans.php)); otherwise, use the delivered Test Plan.

Follow the subsystem's test plan to verify that the code works properly on the target platform. Look for any environment variables that are set differently from the standard variables. If the delivery is not a full subsystem delivery only compile and test the delivered PGEs. If the delivery is a delta delivery then the Subsystem decides if it's worth running the Test Plan.

When testing is complete, check the delivery memo for correctness. To fill in Section D.3.b, go to /SPG\_ops/SSIT/CERES/lib/bin and run `local_version.csh`. Create a PDF version of the final Delivery Memo.

Send email to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov) to release the delivery to the ASDC and cc [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov), Jonathan Gleason, the CERES supervisors, and the appropriate subsystem personnel with subject of "Clouds Release Notification (SCCR nnn)."

Release Notification email example:

```
=====
CERES CM Release Notification
=====
```

Clouds (Subsystems 4.1-4.4) is now available on *AMI-P* for SGE and operational testing. Attached is a PDF version of the Clouds Delivery Memo. This delivery is in reference to SCCR #421.

The following files were delivered to /SPG\_ops/delivery/CERES/incoming:

```
clouds_anc_R3-421.list
clouds_anc_R3-421.tar.Z
clouds_data_R3-421.list
clouds_data_R3-421.tar.Z
clouds_opman_R3V10-421.pdf
clouds_src_R3-421.list
```

clouds\_src\_R3-421.tar.Z  
clouds\_test\_plan\_R3V10-421.pdf

The delivered tar files were copied to /SPG\_ops/verify/CERES and un-tarred. The /SPG\_ops/verify/CERES/clouds directory which was the result of the un-tarring was recursively copied to /SPG\_ops/SSIT/CERES. In /SPG\_ops/SSIT/CERES/clouds, the code was successfully compiled and tested according to the subsystem's Test Plan.

Thanks,  
Tammy

Note that if the delivery was a delta delivery for which no testing was done, then change the last line of the above email to "No testing was done for this delta delivery."

Also note that for CERESlib deliveries the first sentence of the Release Notification is changed to "CERESlib is now available on *AMI-P*" since no operational testing is done.

If a new version of the Test Plan was delivered, create a PDF version of the document and deliver it to the ASDC two ways. First, FTP the PDF file to /SPG\_ops/delivery/CERES/incoming on the target platform. Second, attach the PDF file to an email with the subject "Clouds Test Plan (SCCR nnn)." Send the email to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov) and cc [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov).

Test Plan Delivery email example:

Attached is a PDF version of the Clouds Test Plan for your review. I have also placed a copy of this Test Plan on *AMI* in /SPG\_ops/delivery/CERES/incoming. Please provide any comments to Vertley by February 17. This Test Plan is in reference to SCCR #421.

Thanks,  
Tammy

Note that the date for comments in the Test Plan email is two weeks from the release date.

If a new version of the Operator's Manual was delivered, create a PDF version of the document and deliver it to the ASDC two ways. First, FTP the PDF file to /SPG\_ops/delivery/CERES/incoming on the target platform. Second, attach the PDF file to an email with the subject "Clouds Operator's Manual (SCCR nnn)." Send the email to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov) and cc [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov).

Operator's Manual Delivery email example:

Attached is a PDF version of the Clouds Operator's Manual. I have also placed this file on *AMI* in /SPG\_ops/delivery/CERES/incoming. This Operator's Manual is in reference to SCCR #421.

Thanks,  
Tammy

Remove the files associated with the just released delivery from /SPG\_ops/verify/CERES.

Close the appropriate SCCR after receiving notification that the delivery was promoted to production.

Notes:

1. A cron job runs at ten minutes past each hour to change ownership of the tar files to tammy and changes group to cerescm and moves the files from /SCF2/CERES/ceres\_cm/cm\_move to /SCF2/CERES/ceres\_cm/DelPackages. If the files have not been moved to DelPackages, get the files from the cm\_move directory before testing.
2. Instrument Gains Files Delivery email example (send to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov), cc [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov), Jonathan Gleason, Denise Cooper, and the CERES supervisors):

```
=====
CERES CM Delivery Notification
=====
```

The updated gains for Terra FM1 and FM2 for the period beginning March 1, 2002 through December 31, 2002 and for Aqua FM3 and FM4 for the period beginning January 1, 2003 through April 30, 2003 are now available on *AMI-P*.

The following files were delivered to /SPG\_ops/delivery/CERES/incoming:

```
instrument_gains_20030219.list
instrument_gains_20030219.tar.Z
```

The delivered tar file was copied to /SPG\_ops/verify/CERES and un-tarred. The /SPG\_ops/verify/CERES/instrument directory which was the result of the un-tarring was recursively copied to /SPG\_ops/SSIT/CERES.

Once the files have been promoted to production, CER1.3P3 can be processed for Terra for data from March 2002 through September 2002. NOTE: The Aqua gains are not expected to change, which is why they have been extended through April 2003. Since Denise will be out of town most of April, this will allow production of Aqua Edition1/Beta2 products to continue for Instrument. However, there may be changes in the Spectral Response Functions, so ERBE-Like should not be run for March and April 2003 before checking with Ed Kizer to determine if he will have any updates.

Thanks,  
Tammy

- ERBE-like Spectral Response Function Files Delivery email example (send to [larc-asdc-cerestst@lists.nasa.gov](mailto:larc-asdc-cerestst@lists.nasa.gov), cc [larc-cerescm@lists.nasa.gov](mailto:larc-cerescm@lists.nasa.gov), Jonathan Gleason, Dale Walikainen, and the CERES supervisors):

=====  
CERES CM Delivery Notification  
=====

The updated Spectral Response Function files for Terra FM1 and FM2 for the period beginning October 1, 2001 through February 28, 2002 are now available on *AMI-P*.

The following files were delivered to /SPG\_ops/delivery/CERES/incoming:

erbelike\_srf\_Terra\_20030129.list  
erbelike\_srf\_Terra\_20030129.tar.Z

The delivered tar file was copied to /SPG\_ops/verify/CERES and un-tarred. The /SPG\_ops/verify/CERES/erbelike directory which was the result of the un-tarring was recursively copied to /SPG\_ops/SSIT/CERES.

Once the files have been promoted to production, CER2.4P1 can be processed for Terra FM1 and FM2 for the dates shown above.

-----  
NOTE: Only run CER2.4P1 for the 15th of the month.  
-----

CER2.4P1 should be run with FM1 SW and TOT channel srf changes only.

Where xxx = 12

Example: gen\_pcf.CER2.4P1 20011015 12

CER2.4P1 should be run with FM2 TOT channel srf changes only.

Where xxx = 2

Example: gen\_pcf.CER2.4P1 20011015 12

CER2.2P1, CER2.3P1, and CER2.3P2 should then be

run with the following options: A F M T

Where snow = A, adm = F, spcor = M, and swoff = T

Example: gen\_pcf.CER2.2 20011012 A F M T

Thanks,  
Tammy