

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

## **Data Management System**

### **Operator's Manual**

#### **CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product (Subsystem 9.0)**

**CER9.0P1, CER9.0P2, CER9.0P3, CER9.0P4, CER9.0P5, CER9.0P6,  
CER9.0P7, CER9.0P8, CER9.1P1, CER9.1P2, CER9.2P2, CER9.3P2,  
CER9.4P2, CER9.2P3, CER9.3P3, and CER9.4P3**

**Release 5  
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## 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
09/25/01	R3V3	298	<ul style="list-style-type: none"> <li>• Updated Sample Input file listings for CER6.1, CER6.2, and CER6.3.</li> <li>• Updated format to comply with standards.</li> </ul>	Apps. C.1, C.2, & C.3 All
03/15/02	R3V4	326	<ul style="list-style-type: none"> <li>• Updated Expected Output File Listing table for each PGE to include log, PCF file names.</li> <li>• Updated format to comply with standards.</li> </ul>	Apps. C.1.6, C.2.6, C.3.6, C.4.6, C.5.6, C.6.6, & C.7.6 All
10/04/02	R3V5	388	<ul style="list-style-type: none"> <li>• Added Input Dataset, SSFA, to Processor Dependencies for PGE CER9.2P1.</li> <li>• Updated format to comply with standards.</li> </ul>	Sec. 5.3.2 All
12/02/02	R3V6	403	<ul style="list-style-type: none"> <li>• Added new CCcodes for PGEs CER9.4P1, and CER6.3P1.</li> <li>• Updated format to comply with standards.</li> </ul>	Secs. 3.2, 3.3, 3.4, 3.5, 3.6, 7.2, 7.3, 7.4, 7.5, & 7.6 All
01/23/03	R3V7	409	<ul style="list-style-type: none"> <li>• Updated number of generated hdf files for TRMM and Terra processing.</li> <li>• Updated format to comply with standards.</li> </ul>	Secs. 3.6 & 7.6 All
02/10/03	R3V8	423	<ul style="list-style-type: none"> <li>• Updated number of generated hdf files from 36 to 60 for Terra processing.</li> <li>• Updated format to comply with standards.</li> </ul>	Sec. 3.6 All
10/29/03	R3V9	476	<ul style="list-style-type: none"> <li>• Added overlap input file information.</li> <li>• Updated Total Run time according to the DAAC estimates.</li> <li>• Updated format to comply with standards.</li> </ul>	Secs. 1.3, 1.6, & 2.3 Sec. 3.2 All
06/04/04	R4V1	535	<ul style="list-style-type: none"> <li>• Added additional overlap file processing information.</li> </ul>	Secs. 1.3, 1.6, 2.3, 5.3, 5.6, & 6.3

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
06/04/04  (Cont'd)	R4V1	535	<ul style="list-style-type: none"> <li>Updated production script names since each PGE now has a separate script.</li> <li>Updated Total Run times according to the DAAC estimates.</li> <li>Added a footnote to overlap files.</li> <li>Updated overlap file description.</li> <li>Added overlap file information.</li> <li>Updated overlap input file names.</li> <li>Added inversion SS, PS, CC codes.</li> <li>Updated overlap file information.</li> <li>Included more detail description for MOVLP files.</li> <li>Included number of hdf files for Aqua process.</li> <li>Updated format to comply with standards.</li> </ul>	<p>Secs. 1.4, 1.4.3, 2.4, 2.4.3, 5.4, 5.4.3, 6.4, &amp; 6.4.3</p> <p>Secs. 1.2.4, 2.2.4, 3.2.4, 5.2.4, 6.2.4, &amp; 7.2.4</p> <p>Sec. 1.6</p> <p>Secs. 5.3.2 &amp; 5.3.4</p> <p>Sec. 5.6</p> <p>App. C.6</p> <p>Sec. 1.2.2</p> <p>Secs. 1.3.2, 1.3.4, 2.3.2, 5.3.2, 5.3.4, &amp; 6.3.2</p> <p>Sec. 5.6</p> <p>Sec. 7.6</p> <p>All</p>
11/04/04	R4V2	565	<ul style="list-style-type: none"> <li>Added separate Production Strategy, Configuration Code environment variables for PGE(s) CER9.2P1, CER9.3P1, and CER9.4P1.</li> <li>Updated format to comply with standards.</li> </ul>	<p>Secs. 5.2.2, 5.4, 5.6, 5.7, 6.2.2, 6.3-6.7, 7.2.2, &amp; 7.3-7.6</p> <p>All</p>
11/29/04	R4V3	571	<ul style="list-style-type: none"> <li>Separate environment variable scripts were created for each TISA Gridding PGE.</li> <li>Updated format to comply with standards.</li> </ul>	<p>Secs. 1.2, 1.4, 2.2, 2.4, 3.2, 3.4, 4.2, 4.4, 5.2, 5.4, 5.5, 5.6, 6.2, 6.3, 6.4, 7.2, 7.4, 7.5, &amp; 7.6</p> <p>All</p>
09/15/05	R4V4	594	<ul style="list-style-type: none"> <li>Added two flags (manualrun, testrun) to environment variable scripts.</li> <li>Added additional overlap file processing information.</li> </ul>	<p>Secs. 2.2, 3.2, 6.2, &amp; 7.2</p> <p>Secs. 4.3.1 &amp; 4.3.2</p>

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
09/15/05  (Cont'd)	R4V4	594	<ul style="list-style-type: none"> <li>Updated input, output data set file sizes.</li> </ul>	Secs. 1.3, 1.6, 2.3, 2.6, 3.3, 3.6, 4.3, 4.6, 5.3, 5.6, 6.3, 6.6, 7.3, & 7.6
	R4V4	594	<ul style="list-style-type: none"> <li>Updated format to comply with standards.</li> </ul>	All
04/03/08	R5V1	672	<ul style="list-style-type: none"> <li>Added new section to include new PGE CER9.0P1 processing information.</li> </ul>	Secs. 4.0 & C.4
10/21/08	R5V2	684	<ul style="list-style-type: none"> <li>Updated PGE CER9.1 to reflect the directory structure changes.</li> <li>Changed directory path.</li> </ul>	Secs. 5.0 & Table 5-6 App. C.5
10/21/08	R5V3	685	<ul style="list-style-type: none"> <li>Updated PGEs 6.1P1 – 6.3P1 and 9.2P1 – 9.4P1 to reflect the directory structure changes.</li> <li>The word "meta" was added to PGE CER9.0P1 ISCCP-D2like-Day and ISCCP-D2like-Nit output files. (04/22/09)</li> </ul>	Secs. 1.0 – 3.0 & 6.0 – 8.0 Table 4-6
11/25/09	R5V4	746	<ul style="list-style-type: none"> <li>Updated pcf, run scripts directory path location from bin directory to rcf directory for PGE CER9.0P1.</li> <li>Removed Appendix C - Sample ASCII (PCFin) File Listing since PCFin files are no longer required.</li> </ul>	Secs. 4.4.2 – 4.4.5  App. C
11/25/09  Cancelled 06/02/10	R5V5	739	<ul style="list-style-type: none"> <li>Added new PGE information.</li> <li>New PGEs (CER9.2P2, CER9.3P2, CER9.4P2) to support Subsystem 9 Edition3 processing.</li> <li>Modified link in PGEs CER6.2P1 and 6.3P1 exit code tables to read "Appendix B" instead of "Appendix A." (05/19/2010)</li> </ul>	Document Overview Secs. 9.0 – 11.0 Tables 2-5 & 3-4
06/02/10	R5V6	789	<ul style="list-style-type: none"> <li>Replaced previous text for PGEs CER9.2P2, CER9.3P2, and CER9.4P2 with updated information.</li> <li>Replaced previous text for PGEs CER9.2P2, CER9.3P2, and CER 9.4P2 to support Edition3 processing on P4.</li> </ul>	Document Overview  Secs. 9.0 – 11.0
03/22/10	R5V7	763	<ul style="list-style-type: none"> <li>New PGEs (CER9.0P2 and 9.0P3) to support ISCCP-D2like-Mrg processing on AMI (P6).</li> </ul>	Document Overview, Secs. 12.0 & 13.0

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
03/22/10  (Cont'd)	R5V7	763	<ul style="list-style-type: none"> <li>Added "Available Through Ordering Tool" column and removed "meta" from expected output tables.</li> <li>"No" was changed to "Yes" in the "Available Through Ordering Tool" column for CER_FSW, CER_SFC, and CER_SFC output files.</li> <li>Added Subsystem 11 environment variables. (03/01/2011)</li> <li>Added Subsystem 11 input information. (03/01/2011)</li> <li>Added PGE execution procedures in SGE. (03/01/2011)</li> <li>Added platform option in the command line to run using SGE. (03/10/2011)</li> <li>Added QA file information. (12/09/2011)</li> <li>Modified ISCCP file name, Freq/PGE column, and added "nnn" footnote. (03/28/2012)</li> <li>Modified D2like-MrgQA to read D2likeMrgQA in the expected output files. (03/30/2012)</li> </ul>	<p>All Expected Output Tables</p> <p>Tables 3-5, 8-5, &amp; 11-5</p> <p>Sec. 13.2.2</p> <p>Sec. 13.3</p> <p>Sec. 13.4.2</p> <p>Secs. 12.4.2 &amp; 13.4.2</p> <p>Table 13-6</p> <p>Table 12-6</p> <p>Table 13-6</p>
07/25/12	R5V8	914	<ul style="list-style-type: none"> <li>Modified scripts names and directory paths. Removed file names that no longer generate in <i>AMI-P6</i> environment.</li> <li>Modified scripts names and directory paths. Removed file names that no longer generate in <i>AMI-P6</i> environment.</li> <li>Modified scripts names and directory paths. Removed file names that no longer generate in <i>AMI-P6</i> environment.</li> <li>Modified scripts names and directory paths. Removed file names that no longer generate in <i>AMI-P6</i> environment.</li> </ul>	<p>Secs.5.1.1, 5.2.2, 5.3.1, 5.3.2, 5.4, 5.5.2, 5.5.3, &amp; Table 5.6</p> <p>Secs.9.1.1, 9.2.2, 9.3.1, 9.3.2, 9.3.3, 9.3.4, 9.4, 9.4.1, 9.4.2, 9.5.2, &amp; Table 9.6</p> <p>Secs.10.1.1, 10.2.2, 10.3.1, 10.3.2, 10.4, 10.4.1, 10.4.2, 10.5.2, &amp; Tables 10.6 &amp; 10.7</p> <p>Secs.11.1.1, 11.2.2, 11.3.1, 11.4, 11.4.1, 11.4.2, 11.5.2, &amp; Tables 11.6 &amp; 11.7</p>

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
07/25/12 (Cont'd)	R5V8	914	<ul style="list-style-type: none"> <li>Removed PGEs CER6.1P1, CER6.2P1, CER6.3P1, CER9.1P1 (trmm only), CER9.2P1, CER9.3P1, and 9.4P1. (11/16/2012)</li> <li>Target PGE was changed from CER9.3P1 to CER9.3P2. (11/16/2012)</li> <li>Added back in PGE CER9.1P1 which was deleted by mistake. (12/06/2012)</li> <li>Added new environment variables. (12/18/2012)</li> <li>Updated file paths. (12/18/2012)</li> <li>Added commands to run process using SGE. (12/18/2012)</li> <li>Added SKIP_HR variable. (12/20/2012)</li> <li>Added -force option constraints. (01/09/2013)</li> <li>Removed CERES from the file names. (01/09/2013)</li> </ul>	<p>Subsystem Overview, Secs. 1.0, 2.0, 3.0, 5.0, 6.0, 7.0, &amp; 8.0</p> <p>Table 9-6</p> <p>Sec. 5.0</p> <p>Secs. 2.2.2, 3.2.2, 4.2.2, &amp; 5.2.2</p> <p>Secs 2.3.1, 2.3.2, 2.3.3, 2.3.4, 5.3.1, &amp; 5.3.2</p> <p>Sec. 2.4.2, 3.4.2, 4.4.2, &amp; 5.4.2</p> <p>Sec. 5.2.2</p> <p>Sec. 3.4.3</p> <p>Table 5-6</p>
07/25/12	R5V9	915	<ul style="list-style-type: none"> <li>Updated Responsible persons.</li> <li>Added new environment variables.</li> <li>Updated input data set directory location.</li> <li>Updated operating procedures using SGE.</li> <li>Updated expected output met file directory location.</li> <li>Removed sed command related output file and updated day file directory location.</li> </ul>	<p>Table 1-1</p> <p>Sec 1.2.2</p> <p>Sec 1.3.1</p> <p>Sec 1.4</p> <p>Table 1-6</p> <p>Table 1-7</p>
03/21/13	R5V10	961	<ul style="list-style-type: none"> <li>Updated Responsible persons.</li> <li>Updated how to execute the PGE commands.</li> <li>Updated Parent PGE description.</li> <li>Re-ordered PGEs in document.</li> </ul>	<p>Tables 6-1 &amp; 7-1</p> <p>Secs. 6.4.2 &amp; 7.4.2</p> <p>Table 7-2</p> <p>All</p>

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
03/21/13 (Cont'd)	R5V10	961	<ul style="list-style-type: none"> <li>Modified Input data file disposition to make it consistent with FMP changes. (09/04/2013)</li> <li>Updated output product destination. (09/04/2013)</li> <li>Modified Target PGE. (09/19/2013)</li> <li>Removed (f.) as there were two of them. (10/04/2013)</li> <li>Changed #1 to #2 for dataset name. (10/04/2013)</li> <li>Fixed some cross reference link issues. (10/11/2013)</li> </ul>	Secs. 1.3.1, 2.3.1, 3.3.1, 3.3.2, 4.3.1, 4.3.2, 5.3.1-5.3.4, & 7.3.1 Tables 1-6, 3-6, & 4-6 Tables 6-3 & 6-6 Sec. 1.3 Secs. 5.3.3, 5.3.4, & 6.3.2 All
12/12/12	R5V11	940	<ul style="list-style-type: none"> <li>New PGEs (CER9.0P4 and 9.0P5) to support FluxByCloudTyp processing on <i>AMI</i> (P6).</li> <li>Added DPO to destination column for output files that need to be placed not only into the Archive, but into the DPO. (06/04/2014)</li> </ul>	Document Overview, Secs. 4.0 & 5.0 Tables 5-6, 6-6, & 8-6
06/14/14	R5V12	1018	<ul style="list-style-type: none"> <li>Initial delivery of PGE CER9.1P2 to process Edition4 PMOA version.</li> <li>Added the note, "This PGE is not currently active."</li> </ul>	Document Overview, Subsystem Overview, Sec 7.0, Appedix B Secs. 4.0 & 5.0
04/16/14	R5V13	1010	<ul style="list-style-type: none"> <li>Initial delivery of PGEs CER9.2P3, CER9.3P3, and CER9.4P3 to process Edition 4 SSF1deg-Hr, SSF1deg-B, SSF1degD, and SSF1deg-Hour versions.</li> <li>Modified PGE CER9.2P3 SSF1deg output file target PGE to read 9.3P3 instead of 9.3P2. (01/20/2015)</li> <li>Added "Edition3" to PGE CER9.1P1 section. (03/25/2015)</li> <li>Changed 7.1.1P1 to 7.3.1P1, changed 10.1P1 to 10.0P3, and removed CER8.1P1 line. (03/25/2015)</li> </ul>	Document Overview, Subsystem Overview, Secs. 11.0, 12.0, & 13.0 Table 11-6 Sec. 6.0 Table 6-3

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SCCR Approval Date	Release/Version Number	SCCR Number	Description of Revision	Section(s) Affected
04/16/14 (Cont'd)	R5V13	1010	<ul style="list-style-type: none"> <li>• Changed Target PGE to read CER7.3.1P1 and CER10.0P3 for PMOA file. (03/25/2015)</li> <li>• Changed 7.3.1P1 to 7.3.1P3 and 7.3.1P4, and changed 10.0P3 to 10.0P5. (03/25/2015)</li> <li>• Changed 7.3.1P1 and 10.0P4 to read 10.0P3 and 7.3.1P1. (03/25/2015)</li> <li>• Changed 7.3.1P1, 10.0P3, and 10.0P4 to read 7.3.1P3, 7.3.1P4, and 10.0P5. (03/25/2015)</li> <li>• Changed 7.3.1P1, 10.0P3, and 10.0P4 to read 7.3.1P3, 7.3.1P4, and 10.0P5 in SSF1degB output file. (03/25/2015)</li> <li>• Changed 9.2P1 to read 9.2P2. (03/25/2015)</li> <li>• Changed 9.2P1 to read 9.2P3. (03/25/2015)</li> </ul>	<p>Table 6-6</p> <p>Table 7-3</p> <p>Table 9-3</p> <p>Table 12-3</p> <p>Table 12-6</p> <p>Sec. 9.2.5</p> <p>Sec. 12.2.5</p>
01/20/16	R5V14	1108	<ul style="list-style-type: none"> <li>• Added new PGE CER9.0P6 to create intermediate GEO zonal files using 5-channel GEO pixel data to provide inputs to PGE 9.0P8.</li> <li>• Added new PGE CER9.0P7 to create intermediate MODIS zonal files and MOA file to provide inputs to PGE 9.0P8.</li> <li>• Added new PGE CER9.0P8 that creates CldTypHist data product that contains GEO-MODIS derived cloud properties as a function of 9 cloud types, similar to ISCCP D2 product, where the cloud properties are stratified by pressure and optical depth.</li> <li>• Updated platform from x86 to x86-flex. (04/07/2016)</li> <li>• Updated PCF file name to include day variable. Updated output file name to include "Znnn" string at the end. (05/26/2016)</li> <li>• Updated driver script name. (05/26/2016)</li> <li>• Updated temporary file names. (06/02/2016)</li> <li>• Updated Log filenames and sge filenames by adding start_day-end_day. (06/28/2016)</li> <li>• Updated to correct naming convention for the driver script for CER9.0P7 (Jira ticket CER-306). (08/03/2016)</li> <li>• Added Aqua files are mandatory starting from July 2002. (08/11/2016)</li> <li>• Updated Table to accommodate the ASDC requirements. (08/31/2016)</li> </ul>	<p>Sec. 6.0</p> <p>Sec. 7.0</p> <p>Sec. 8.0</p> <p>Secs 6.4.3, 7.4.1, 8.4.2</p> <p>Table 6-5</p> <p>Sec. 8.4.2</p> <p>Table 7-7</p> <p>Table 6-5</p> <p>Sec 7.4.1</p> <p>Secs. 7.3.2 &amp; 8.3.2</p> <p>Table 7-6</p>

## Preface

The Clouds and the Earth's Radiant Energy System (CERES) Data Management System supports the data processing needs of the CERES Science Team research to increase understanding of the Earth's climate and radiant environment. The CERES Data Management Team 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 Atmospheric Science Data Center (ASDC), produces an extensive set of science data products.

The Data Management System consists of 12 subsystems; each subsystem represents one or more stand-alone executable programs. Each subsystem executes when all of its required input data sets are available and produces one or more archival science products.

This Operator's Manual is written for the data processing operations staff at the Langley ASDC by the Data Management Team responsible for this Subsystem. Each volume describes all Product Generation Executables for a particular subsystem and contains the Runtime Parameters, Production Request Parameters, the required inputs, the steps used to execute, and the expected outputs for each executable included within this Subsystem. In addition, all subsystem error messages and subsequent actions required by the ASDC operations staff are included.

Acknowledgment is given to the CERES Documentation Team for their support in preparing this document.

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## 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.

## Document Overview

This document, CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Release 5 Operator's Manual, is part of the CERES Subsystem 9.0 Release 5 delivery package provided to the Langley Atmospheric Science Data Center (ASDC). It provides a description of the CERES Time Interpolation and Spatial Averaging (TISA) Gridding Release 5 software and explains the procedures for executing the software. A description of acronyms and abbreviations is provided in [Appendix A](#) and a comprehensive list of messages that can be generated during the execution of Product Generation Executives (PGE), CER9.0P1, CER9.0P2, CER9.0P3, CER9.0P4, CER9.0P5, CER9.0P6, CER9.0P7, CER9.0P8, CER9.1P1, CER9.1P2, CER9.2P2, CER9.3P2, CER9.4P2, CER9.2P3, CER9.3P3, and CER9.4P3 are contained in [Appendix B](#).

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[Introduction](#)

[Document Overview](#)

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1.0 PGENAME: CER9.0P1

2.0 PGENAME: CER9.0P2

3.0 PGENAME: CER9.0P3

4.0 PGENAME: CER9.0P4

5.0 PGENAME: CER9.0P5

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[Appendix A](#) - Acronyms and Abbreviations

[Appendix B](#) - Error Messages

## **Subsystem Overview**

### **CER9.0P1 - CERES Grid Single Satellite ISCCP-D2like Clouds and Compute Spatial Averages Hierarchical Data Format (HDF) Main Processor**

The Subsystem 9.0 Main Processor grids and spatially averages the footprint data from the CERES Single Satellite Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on GMT time associated with the footprint. The footprints in each regional hour box are averaged together and written to Monthly Gridded Single Satellite Clouds (ISCCP-D2like) HDF product.

### **CER9.1P1 - CERES Post Meteorological, Ozone, and Aerosol (PMOA) Processor**

The Post-MOA Processor processes the hourly Meteorological, Ozone, and Aerosol (MOA) products for a given month to produce a monthly PMOA data product. The monthly PMOA data product is organized in four files which contain regional-hourly records sorted by region and then by hour for the CERES 1.0-degree nested regions. The Post-MOA Processor requires at least 1 hour of MOA data in order to process; however, if available, it can process the whole month of MOA data. The PMOA data product is a subset of the MOA data product.

**CER9.1P2 - CERES Post Meteorological, Ozone, and Aerosol (PMOA) Processor**

The Post-MOA Processor processes the hourly Meteorological, Ozone, and Aerosol (MOA) products for a given month to produce a monthly PMOA data product. The monthly PMOA data product is organized in four files which contain regional-hourly records sorted by region and then by hour for the CERES 1.0-degree nested regions. The Post-MOA Processor requires at least 1 hour of MOA data in order to process; however, if available, it can process the whole month of MOA data. The PMOA data product is a subset of the MOA data product

**CER9.2P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor**

The Subsystem 9.0 Main Processor grids and spatially averages the footprint data from the CERES Single Satellite TOA; Surface Flux and Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on local time associated with the footprint. The footprints in each regional hour box are averaged together and written to an hourly Monthly Gridded Single Satellite TOA and Surface Fluxes and Clouds (SFC) intermediate product.

**CER9.3P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor**

The Subsystem 9.0 Postprocessor sorts and merges the hourly SFC intermediate products for a given month to produce a monthly SFC data product. The monthly SFC data product is organized in 180 zonal files which contain regional hour boxes sorted by region and then by hour. The SFC Postprocessor only produces the monthly SFC zonal files for zones which contain regional hour box data.

**CER9.4P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor**

The Subsystem 9.0 Hierarchical Data Format (HDF) Postprocessor converts the monthly SFC zonal files for a given month into a monthly SFC HDF data product. The monthly SFC HDF product for TRMM consists of eight files, each containing data for ten 1.0-degree equal-angle zones. The HDF product for Terra and Aqua consists of 36 files, each containing data for five 1.0-degree equal-angle zones. The regional hour box data of a monthly SFC HDF data file are written to HDF SDS where the records of the SDS are sorted by region and then by hour.

**ISCCP-D2like-Mrg Pre Processor (PGE 9.0P2)**

The PGE 9.0P2 Merge Pre Processor grids and spatially averages the footprint data from the CERES Single Satellite Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on GMT time associated with the footprint. The footprints in each regional hour box are averaged together and written to 180 zonal files.

**ISCCP-D2like-Mrg Pre Processor (PGE 9.0P3)**

The PGE 9.0P3 Merge Main Processor averages Terra and Aqua gridded CERES Single Satellite Cloud Pixels (SSF) data with the gridded Geostationary data (GGEO) and written to Monthly Gridded Clouds (ISCCP-D2like-Mrg) HDF product.

**Daily Subset SSF Pre Processor (PGE 9.0P4)**

The PGE 9.0P4 Read SSF HDF data product and create Daily Subset SSF for later use in PGE 9.0P5.

**CER9.0P5 - CERES Grid TOA Fluxes and compute TOA fluxes according to 42 cloud types**

Create the LW and SW narrow-band to broadband coefficients. Grid data in 1.0-degree equal-angle. Use cloud properties to create 42 cloud types and compute TOA fluxes for the cloud types.

**CER9.0P6 - CldTypHistB-GEO Edition4**

This PGE CER9.0P6 reads pixel level cloud data from the GEO Satellites' image files. The pixels are assigned to a regional hour box based on GMT time associated with it. The pixels in each regional hour box are averaged and written to zonal files.

**CER9.0P7 - CldTypHistB-MODIS Edition4**

The PGE CER9.0P7 Processor grids and spatially averages the footprint data from the CERES Single Satellite Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on GMT time associated with the footprint. The footprints in each regional hour box are averaged together and written to 180 zonal files. In addition, this processor grids and spatially averages MOA data product and written to one binary file.

**CER9.0P8 – CldTypHist GEO-MODIS Edition4**

The PGE CER9.0P8 creates CldTypHist HDF data product contains GEO-MODIS derived cloud properties as a function of 9 cloud types, similar to ISCCP D2 product, where the cloud properties are stratified by pressure and optical depth. In addition, it produces CldTypHist-GEO and CldTypHist\_MODIS HDF QC files.

**CER9.2P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor - Edition4**

The Subsystem 9.0 Main Processor grids and spatially averages the footprint data from the CERES Single Satellite TOA; Surface Flux and Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on local time associated with the footprint. The footprints in each regional hour box are averaged together and written to an hourly Monthly

Gridded Single Satellite TOA and Surface Fluxes and Clouds (SSF1deg-HR) intermediate product.

**CER9.3P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor - Edition4**

The Subsystem 9.0 Postprocessor sorts and merges the hourly SFC intermediate products for a given month to produce a monthly SSF1degB data product. The monthly SFC data product is organized in 180 zonal files which contain regional hour boxes sorted by region and then by hour. The Postprocessor produces the monthly SSF1degB zonal files for zones which contain regional hour box data and SSF1degD daily files to provide inputs to HDF process.

**CER9.4P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor - Edition4**

The Subsystem 9.0 Hierarchical Data Format (HDF) Postprocessor converts the monthly SSF1degD daily binary files for a given month into a SSF1deg-Hour daily HDF data product. Each HDF file containing data for 1.0-degree equal-angle regions.

## 1.0 PGENAME: CER9.0P1

### CER9.0P1 - CERES Grid Single Satellite ISCCP-D2like Clouds and Compute Spatial Averages Hierarchical Data Format (HDF) Main Processor.

#### 1.1 PGE Details

##### 1.1.1 Responsible Persons

Table 1-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Cathy Nguyen
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 1.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 1.1.1.

##### 1.1.3 Parent PGE(s)

Table 1-2. Parent PGE for CER9.0P1

PGENAME	Description
CER4.5-6.1P1	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

##### 1.1.4 Target PGE(s)

Table 1-3. Target PGEs after CER9.0P1

PGENAME	Description
N/A	N/A

## 1.2 Operating Environment

### 1.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 1-4. Runtime Parameters for CER9.0P1

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 - 12

### 1.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_FM1.csh**' OR '**env-variable\_FM2.csh**' OR '**env-variable\_FM3.csh**' OR '**env-variable\_FM4.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS4\_5 - Sampling Strategy for Inversion, see Production Request
- SS9\_0 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS4\_5 - Production Strategy for Inversion, see Production Request
- PS9\_0 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.0P1, see Production Request
- CC4\_5 - Configuration Code for Inversion, see CM database
- CC9\_0 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.0P1, see CM database
- SW9\_0 - Software Configuration Code for TISAgrid Subsystem 9.0, see CM database
- DATA9\_0 - Data Configuration Code for TISAgrid Subsystem 9.0, see CM database
- PGE - CER9.0P1
- PROD - Yes for production runs, no for test runs

### 1.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 1.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **0.7 GB**  
 Total Run Time: **2 hours**

### 1.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

### 1.3 Processor Dependencies (Previous PGEs, Ingest Data)

#### 1.3.1 Input Dataset Name (#1): SSF

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/SSF/\${SS4\_5}\_\${PS4\_5}/yyyy/mm/  
CER\_SSF\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddhh**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: None, process when all input data are available.
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER4.5-6.1P2 (Terra), CER4.5-6.1P3 (Aqua)**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **400**

### 1.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.0P1\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing one of the the TISAgrid specific environment script, '**env-variable\_FM1.csh**' OR '**env-variable\_FM2.csh**' OR '**env-variable\_FM3.csh**' OR '**env-variable\_FM4.csh**' depending on the processing satellite, then executing the PCF generator, **pcf\_gen\_9.0P1.pl**.

#### 1.4.1 How to Generate the PCF File

The PCF generator, **pcf\_gen\_9.0P1.pl**, is executed using the year,month as command line arguments.

At the command line (>) type:

```
> pcf_gen_9.0P1.pl yyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.0P1/rcf/pcf:**  
**CER9.0P1\_PCF\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm**

### 1.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.0P1\_processor.pl**, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P1/rcf
> set PCFDIR = $CERESHOME/tisa_grid/CER9.0P1/rcf/pcf
> $CERESHOME/tisa_grid/rcf/CER9.0P1_processor.pl
   $PCFDIR/CER9.0P1_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm
```

#### To Run using SGE:

**Note: It is not necessary to manually create the PCF as described above when submitting a job using SGE submission script**

```
cd $CERESHOME/tisa_grid/CER9.0P1/rcf
CER9.0P1-SGE_Driver.pl -date yyyymm -platform cpu
```

#### To run multiple sequential months:

```
cd $CERESHOME/tisa_grid/CER9.0P1/rcf
CER9.0P1-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-force]</b>	<b>Force to run the job with less than required inputs</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year/month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process.</b>

### 1.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 1.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.0P1/rcf/clean.pl yyyymm
```

### 1.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P1 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 1.5 Execution Evaluation

### 1.5.1 Exit Codes

The processor CER9.0P1 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 1.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 1.1.1) for assistance.

Table 1-5. Exit Codes for CER9.0P1

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 1.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **pcf\_gen\_9.0P1.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 1.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: CER9.0P1\_LogReport\_{\$SS9\_0}\_{\$PS9\_0}\_{\$CC9\_0}.yyyymm

The Report Log File contains the TISA Gridding related 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

#### 2. Status Log File: CER9.0P1\_LogStatus\_{\$SS9\_0}\_{\$PS9\_0}\_{\$CC9\_0}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.0P1\_LogUser\_{\$SS9\_0}\_{\$PS9\_0}\_{\$CC9\_0}.yyyymm

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.

### 1.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.0P1 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 1.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

#### b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

### 1.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 1-6. Expected Output File Listing for CER9.0P1

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P1_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm @(\$CERESHOME/tisa_grid/CER9.0P1/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P1_LogReport_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P1_LogStatus_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P1_LogUser_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_ISCCP-D2like-Day_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm(.met)@(\$CERESHOME/tisa_grid/data/ISCCP- D2like-Day/\${SS9_0}_\${PS9_0}/yyyy/mm)	m	600	1/mth	N/A	Archive, rm	Yes
CER_ISCCP-D2like-Nit_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm(.met)@(\$CERESHOME/tisa_grid/data/ISCCP- D2like-Nit/\${SS9_0}_\${PS9_0}/yyyy/mm)	m	600	1/mth	N/A	Archive, rm	Yes

a. See Section 1.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year

mm - 2-digit month {valid values: 01 .. 12}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour

## 1.7 Expected Temporary Files/Directories

Table 1-7. Temporary Files Listing

Directory	File Name
\${CERESHOME}/tisa_grid/scr	CER_ISCCP- D2likeD_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymmdd

## 2.0 PGENAME: CER9.0P2

### CER9.0P2 - CERES Grid Single Satellite ISCCP-D2like-Mrg Clouds and Compute Spatial Averages Hierarchical Data Format (HDF) Pre Processor.

## 2.1 PGE Details

### 2.1.1 Responsible Persons

Table 2-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

### 2.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 2.1.1.

### 2.1.3 Parent PGE(s)

Table 2-2. Parent PGE for CER9.0P2

PGENAME	Description
CER4.5-6.1P1	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

## 2.1.4 Target PGE(s)

Table 2-3. Target PGEs after CER9.0P2

PGName	Description
CER9.0P3	CERES grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 ISCCP-D2like-Mrg HDF Processor.

## 2.2 Operating Environment

### 2.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 2-4. Runtime Parameters for CER9.0P2

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 - 12

### 2.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS4\_5 - Instrument 1, Sampling Strategy for Inversion, see Production Request
- SS4\_5\_2 - Instrument 2, Sampling Strategy for inversion, see Production Request
- SS9\_0 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS4\_5 - Production Strategy for Inversion, see Production Request
- PS9\_0 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.0P2, see Production Request
- CC4\_5 - Configuration Code for Inversion, see CM database
- CC9\_0 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.0P2, see CM database
- SW9\_0 - Software Configuration Code for TISAgrid Subsystem 9.0, see CM database
- DATA9\_0 - Data Configuration Code for TISAgrid Subsystem 9.0, see CM database
- PGE - CER9.0P2
- PROD - Yes
- Input Archive - /ASDC\_archive/CERES

### 2.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 2.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **0.7 GB**  
 Total Run Time: **2 hours**

### 2.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

## 2.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 2.3.1 Input Dataset Name (#1): SSF

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/CERES/SSF/\${SS4\_5}\_\${PS4\_5}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddhh  
 \$InputArchive/CERES/SSF/\${SS4\_5\_2}\_\${PS4\_5}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddhh**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: None, process when all input data are available.

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER4.5-6.1P2 (Terra), CER4.5-6.1P3 (Aqua)**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**  
 d. File Disposition after successful execution: **N/A**  
 e. Typical file size (MB): **400**

## 2.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.0P2\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the **CER9.0P2\_pcf\_gen.pl**.

### 2.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P2\_pcf\_gen.pl**, is executed using the newly created ASCII input file name as a command line argument.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P2/rcf
>CER9.0P2_pcf_gen.pl yyyymm
```

The following file will be generated in \$CERESHOME/tisa\_grid/CER9.0P2/rcf/pcf:

```
CER9.0P2_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm
CER9.0P2_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm.log
```

### 2.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.0P2\_processor.pl**, followed by the newly created PCF file name as a command line argument.

**To Run at the command line:**

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.0P2/rcf/pcf
> $CERESHOME/tisa_grid/CER9.0P2/rcf/CER9.0P2_processor.csh
   $PCFDIR/CER9.0P2_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
> cd $CERESHOME/tisa_grid/CER9.0P2/rcf
> CER9.0P2-SGE_Driver.pl -date yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P2/rcf
> CER9.0P2-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

### 2.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

#### 2.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.0P2/rcf/clean.pl yyyyymm
```

#### 2.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 2.5 Execution Evaluation

#### 2.5.1 Exit Codes

The processor CER9.0P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 2.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 2.1.1) for assistance.

Table 2-5. Exit Codes for CER9.0P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

#### 2.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **pcf\_gen\_9.0P2.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

#### 2.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

##### 1. Report Log File: CER9.0P2\_LogReport\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyyymm

The Report Log File contains the TISA Gridding related 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

## 2. Status Log File: CER9.0P2\_LogStatus\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

## 3. User Log File: CER9.0P2\_LogUser\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

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.

### 2.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.0P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 2.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

#### b. Target PGE Termination

If any of the .met files are missing from the expected output, this condition must terminate all further Target PGE processing.

## 2.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 2-6. Expected Output File Listing for CER9.0P2

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P2_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm @(\$CERESHOME/tisa_grid/CER9.0P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P2_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm.log@(\$CERESHOME/tisa_grid/CER9.0P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P2_LogReport_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P2_LogStatus_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P2_LogUser_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_ISCCP-D2likeB_\${SS9_0}_\${PS9_0}_\${CC9_0}. yyyymmZnnn(.met)@(\$CERESHOME/tisa_grid/data/ISCCP- D2likeB/\${SS9_0}_\${PS9_0}/yyyy/mm	m	300	150- 180/ mth	CER9.0P3	Archive	No

a. See Section 2.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour  
nnn - 3-digit zone number (valid values: 001 ... {150-180})

## 2.7 Expected Temporary Files/Directories

Table 2-7. Temporary Files Listing

Directory	File Name
\$(CERESHOME)/tisa_grid/sct/	CER_ISCCP- D2likeSSFD_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymmdd
\$(CERESHOME)/tisa_grid/sct/	CER_ISCCP- D2likeD_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymmdd

### 3.0 PGENAME: CER9.0P3

**CER9.0P3 - CERES Grid Single Satellite ISCCP-D2like-Mrg Clouds and Compute Spatial Averages Hierarchical Data Format (HDF) Main Processor.**

#### 3.1 PGE Details

##### 3.1.1 Responsible Persons

Table 3-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 3.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 3.1.1.

##### 3.1.3 Parent PGE(s)

Table 3-2. Parent PGE for CER9.0P3

PGENAME	Description
CER9.0P2	CERES Grid Single Satellite ISCCP-D2like-Mrg Clouds and Compute Spatial Averages Hierarchical Data Format (HDF) Pre Processor.

##### 3.1.4 Target PGE(s)

Table 3-3. Target PGEs after CER9.0P3

PGENAME	Description
N/A	N/A

## 3.2 Operating Environment

### 3.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 3-4. Runtime Parameters for CER9.0P3

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 - 12

### 3.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS9\_0T - Sampling Strategy for TISAGrid Subsystem 9.0, see Production Request for Terra
- SS9\_0A - Sampling Strategy for TISAGrid Subsystem 9.0, see Production Request for Aqua
- SS11 - Sampling Strategy for TISA Subsystem 11, see Production Request
- SS9\_0 - Sampling Strategy for TISAGrid Subsystem 9.0, PGE 9.0P3, see Production Request
- PS9\_0T - Production Strategy for TISAGrid Subsystem 9.0, see Production Request for Terra
- PS9\_0A - Production Strategy for TISAGrid Subsystem 9.0, see Production Request for Aqua
- PS11 - Production Strategy for TISA Subsystem 11, see Production Request
- PS9\_0 - Production Strategy for TISAGrid Subsystem 9.0, PGE CER9.0P3, see Production Request
- CC9\_0T - Configuration Code for TISAGrid Subsystem 9.0, see CM database
- CC9\_0A - Configuration Code for TISAGrid Subsystem 9.0, see CM database
- CC11 - Configuration Code for TISA Subsystem 11, see CM database
- CC11\_6 - Configuration Code for TISA Subsystem 11, see CM database
- CC9\_0 - Configuration Code for TISAGrid Subsystem 9.0, PGE CER9.0P3, see CM database
- SW9\_0 - Software Configuration Code for TISAGrid Subsystem 9.0, see CM database
- DATA9\_0 - Data Configuration Code for TISAGrid Subsystem 9.0, see CM database
- PGE - CER9.0P3

PROD - no  
 Input ArchiveSS - \$CERESHOME/tisa\_grid/data

### 3.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 3.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **0.7 GB**  
 Total Run Time: **2 hours**

### 3.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

## 3.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 3.3.1 Input Dataset Name (#1): ISCCP-D2likeB

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchiveSS/ISCCP-D2likeB/\${SS9\_0T}\_\${PS9\_0T}/yyyy/mm/  
 CER\_ISCCP-D2likeB\_\${SS9\_0T}\_\${PS9\_0T}\_\${CC9\_0T}.yyyymmznnn  
 \$InputArchiveSS/ISCCP-D2likeB/\${SS9\_0A}\_\${PS9\_0A}/yyyy/mm/  
 CER\_ISCCP-D2likeB\_\${SS9\_0A}\_\${PS9\_0A}\_\${CC9\_0A}.yyyymmznnn**

**Where nnn = 1 .. 180**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
  2. Time Related Dependency:
 

**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER9.0P2**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **400**

### 3.3.2 Input Dataset Name (#2): GGEO or GGEOW

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/CERES/GGEO/\${SS11}\_\${PS11}/yyyy/mm/CER\_GGEO\_\${SS11}\_  
\_\${PS11}\_\${CC11}.yyyymm**

**OR**

**\$InputArchive/CERES/GGEOW/\${SS11}\_\${PS11}/yyyy/mm/CER\_GGEOW\_\${S  
S11}\_\${PS11}\_\${CC11\_6}.yyyymm**

1. Mandatory/Optional: **The file is mandatory.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER11.2P2**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **400**

### 3.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.0P3\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the **CER9.0P3\_pcf\_gen.pl**.

#### 3.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P3\_pcf\_gen.pl**, is executed using yyyymm as a command line argument.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P3/rcf
> CER9.0P3_pcf_gen.pl yyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.0P3/rcf/pcf:**  
**CER9.0P3\_PCF\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm**

#### 3.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.0P3\_processor.pl**, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P3/rcf
> set PCFDIR = $CERESHOME/tisa_grid/CER9.0P3/rcf/pcf
> $CERESHOME/tisa_grid/rcf/CER9.0P3_processor.pl
   $PCFDIR/CER9.0P3_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm
```

#### To Run at the command line:

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.0P3/rcf/pcf
> $CERESHOME/tisa_grid/CER9.0P3/rcf/CER9.0P3_processor.csh
   $PCFDIR/CER9.0P3_PCF_${SS9_0}_${PS9_0}_${CC9_0}.yyyymm
```

#### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.0P3/rcf
>CER9.0P3-SGE_Driver.pl -date yyyymm -platform cpu -clean
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P3/rcf
> CER9.0P3-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

### 3.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 3.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.0P3/rcf/clean.pl yyyymm
```

### 3.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 3.5 Execution Evaluation

### 3.5.1 Exit Codes

The processor CER9.0P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 3.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 3.1.1) for assistance.

Table 3-5. Exit Codes for CER9.0P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 3.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **pcf\_gen\_9.0P3.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 3.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: CER9.0P3\_LogReport\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

The Report Log File contains the TISA Gridding related 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

#### 2. Status Log File: CER9.0P3\_LogStatus\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.0P3\_LogUser\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

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.

### **3.5.4 Solutions to Possible Problems**

All output files are opened with Status = NEW in PGE CER9.0P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### **3.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)**

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

### **3.6 Expected Output Dataset(s)**

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 3-6. Expected Output File Listing for CER9.0P3

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P3_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/CER9.0P3/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P3_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm.log@(\$CERESHOME/tisa_grid/CER9.0P3/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P3_LogReport_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P3_LogStatus_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P3_LogUser_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_ISCCP-D2like-Mrg_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm(.met)@(\$CERESHOME/tisa_grid/data/ISCCP-D2like-Mrg/\${SS9_0}_\${PS9_0}/yyyy/mm)	m	600	1/mth	N/A	Archive, rm	Yes
CER_ISCCP-D2likeMrgQA_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm(.met)@(\$CERESHOME/tisa_grid/data/ISCCP-D2like-Mrg/\${SS9_0}_\${PS9_0}/yyyy/mm)	m	1	1/mth	N/A	Archive, rm	No

a. See Section 3.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour

### 3.7 Expected Temporary Files/Directories

Table 3-7. Temporary Files Listing

Directory	File Name
\$(CERESHOME)/tisa_grid/scr/	MATCH-D2like-GEO_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm
\$(CERESHOME)/tisa_grid/scr/	scenemap.yyyyymm
\$(CERESHOME)/tisa_grid/scr/	NormCoeff.yyyyymm
\$(CERESHOME)/tisa_grid/scr/	GeoIndex.yyyyymm

#### 4.0 PGEName: CER9.0P4 – (This PGE is not currently active.) CER9.0P4 - CERES FluxByCloudTyp Pre Processor.

#### 4.1 PGE Details

##### 4.1.1 Responsible Persons

Table 4-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Dennis Keyes	Cathy Nguyen
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1650	951-1666
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Dennis.F.Keyes@nasa.gov">Dennis.F.Keyes@nasa.gov</a>	<a href="mailto:Le.T.Nguyen@nasa.gov">Le.T.Nguyen@nasa.gov</a>

##### 4.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 4.1.1.

##### 4.1.3 Parent PGE(s)

Table 4-2. Parent PGE for CER9.0P4

PGEName	Description
CER4.5-6.5P4 and CER4.5-6.5P5	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Edition3 Alternate Main Processor and HDF Postprocessor using Instrument Scan (IES) data

##### 4.1.4 Target PGE(s)

Table 4-3. Target PGEs after CER9.0P4

PGEName	Description
CER9.0P5	CERES FluxByCloudTyp Main Processor.

## 4.2 Operating Environment

### 4.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 4-4. Runtime Parameters for CER9.0P4

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy 4-digit year mm 01 – 12
test_case	run a 1-day test	A	Y, N
satname	satellite name	A	Aqua, Terra

### 4.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER9\_0P4\_Env.pm**' and it uses the following environment variables expected to be set by the ASDC:

SS4_5	- Instrument 1, Sampling Strategy for Inversion, see Production Request
SS4_5_2	- Instrument 2, Sampling Strategy for Inversion, see Production Request
SS9_4	- Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
PS4_5	- Production Strategy for Inversion, see Production Request
PS9_4	- Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.0P4, see Production Request
CC4_5	- Configuration Code for Inversion, see CM database
CC9_4	- Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.0P4, see CM database
SW9_4	- Software Configuration Code for TISAgrid Subsystem 9.0, see CM database
DATA9_4	- Data Configuration Code for TISAgrid Subsystem 9.0, see CM database
PGE	- CER9.0P4
PROD	- Yes
Input Archive	- /ASDC_archive/CERES

### 4.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

#### 4.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **53 GB**  
 Total Run Time: **2 hours**

#### 4.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

### 4.3 Processor Dependencies (Previous PGEs, Ingest Data)

#### 4.3.1 Input Dataset Name (#1): SSF

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/CERES/SSF/${SS4_5}_${PS4_5}/$yyyy/$mm  

CER_SSF_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddhh  

$InputArchive/CERES/SSF/${SS4_5_2}_${PS4_5}/$yyyy/$mm  

CER_SSF_${SS4_5_2}_${PS4_5}_${CC4_5}.yyyymmddhh
```

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: None, process when all input data are available.

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER4.5-6.5P4 (Terra), CER4.5-6.5P5 (Aqua)**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

- d. File Disposition after successful execution: **N/A**

- e. Typical file size (MB): **400**

### 4.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **run\_9.0P4.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **CER9\_0P4\_Env.pm**, then executing the **CER9.0P4\_pcf\_gen.pl**.

#### 4.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P4\_pcf\_gen.pl**, is executed using **yyyymm** and **satname** as command line arguments.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P4/rcf  

> CER9.0P4_pcf_gen.pl -date yyyymm -clean -satellite satname
```

where satname = terra or aqua

The following file will be generated in \$CERESHOME/tisa\_grid/CER9.0P4/rcf/pcf:  
**CER9.0P4\_PCF\_\${SS9\_4}\_\${PS9\_4}\_\${CC9\_4}.yyyymm**

#### 4.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run\_9.0P4.pl**, followed by the newly created PCF file name as a command line argument.

##### To Run at the command line:

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P4/rcf
> $CERESHOME/tisa_grid/CER9.0P4/rcf/run_9.0P4.csh
   ${SS9_4}_${PS9_4}_${CC9_4}.yyyymm
```

##### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.0P4/rcf
>CER9.0P4-SGE_Driver.pl -date yyyymm -clean -satellite satname
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P4/rcf
> CER9.0P4-SGE_Driver.pl -start yyyymm -end yyyymm -clean -satellite
   satname
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (P6 or x86) (Only use P6. x86 will be implemented in a later delivery)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-satellite satname]</b>	<b>satellite name will be either Terra or Aqua</b>
<b>[-test test_case]</b>	<b>Run as a test for day 1 only (for test plan)</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

#### 4.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

#### 4.4.4 File Cleanup for a Failed Job

The following command can be run following an unsuccessful job execution to remove all created output files associated with the job. This should be used with great care:

At the command line (>) type:

**For Terra:**

```
rm -f $DataArchive/scr/$data_year/$data_month/*Terra*
```

**For Aqua:**

```
rm -f $DataArchive/scr/$data_year/$data_month/*Aqua*
```

#### 4.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P4 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 4.5 Execution Evaluation

#### 4.5.1 Exit Codes

The processor CER9.0P4 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 4.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 4.1.1) for assistance.

Table 4-5. Exit Codes for CER9.0P4

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

#### 4.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.0P4\_pcf\_gen.pl**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

#### 4.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

##### 1. Report Log File: CER9.0P4\_LogReport\_\${SS9\_4}\_\${PS9\_4}\_\${CC9\_4}.yyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

## 2. **Status Log File: CER9.0P4\_LogStatus\_\${SS9\_4}\_\${PS9\_4}\_\${CC9\_4}.yyyymm**

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

## 3. **User Log File: CER9.0P4\_LogUser\_\${SS9\_4}\_\${PS9\_4}\_\${CC9\_4}.yyyymm**

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.

### 4.5.4 **Solutions to Possible Problems**

All output files are opened with Status = NEW in PGE CER9.0P4 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 4.5.5 **Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)**

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

#### b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

### 4.6 **Expected Output Dataset(s)**

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 4-6. Expected Output File Listing for CER9.0P4

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P4_PCF_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymm@(\$CERESHOMe/tisa_grid/CER9.0P4/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P4_PCF_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymm.log@(\$CERESHOMe/tisa_grid/CER9.0P4/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P4_LogReport_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P4_LogStatus_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P4_LogUser_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_SSFS-Day_\${SS9_4}_\${PS9_4}_\${CC9_4}.yyyymmdd(.met)@(\$CERESHOMe/tisa_grid/data/scr/yyyy/mm)	m	1750	28..31/mth	CER9.0P5	No Archive	No

a. See Section 4.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
dd - 2-digit day {valid values: 01 .. 31}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour

## 4.7 Expected Temporary Files/Directories

Table 4-7. Temporary Files Listing

Directory	File Name
N/A	N/A

## 5.0 PGENAME: CER9.0P5 – (This PGE is not currently active.) CER9.0P5 - CERES FluxByCloudTyp Main Processor.

### 5.1 PGE Details

#### 5.1.1 Responsible Persons

Table 5-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Dennis Keyes	Cathy Nguyen
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1650	951-1666
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Dennis.F.Keyes@nasa.gov">Dennis.F.Keyes@nasa.gov</a>	<a href="mailto:Le.T.Nguyen@nasa.gov">Le.T.Nguyen@nasa.gov</a>

#### 5.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 5.1.1.

#### 5.1.3 Parent PGE(s)

Table 5-2. Parent PGE for CER9.0P5

PGENAME	Description
CER9.3P2	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Sybsystem 9.0 Postprocessor
CER9.0P4	CERES FluxByCloudTyp Pre Processor

#### 5.1.4 Target PGE(s)

Table 5-3. Target PGEs after CER9.0P5

PGENAME	Description
N/A	N/A

## 5.2 Operating Environment

### 5.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 5-4. Runtime Parameters for CER9.0P5

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 – 12
test_case	run a 1-day test	A	Y, N
satname	satellite name	A	aqua, terra

### 5.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**CER9\_0P5\_env.pm**' and it uses the following environment variables expected to be set by the ASDC:

- SS9 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- SS9\_4 - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P4, see Production Request
- SS9\_5 - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P5, see Production Request
- PS9\_4 - Production Strategy for TISAgrid Subsystem 9.0, PGE9.0P4, see Production Request
- PS9\_5 - Production Strategy for TISAgrid Subsystem 9.0, PGE9.0P5, see Production Request
- PS9\_3 - Production Strategy for TISAgrid Subsystem 9.0, PGE9.3P2, see Production Request
- CC9\_4 - Configuration Code for TISAgrid Subsystem 9.0, PGE9.0P4, see Production Request
- CC9\_5 - Configuration Code for TISAgrid Subsystem 9.0, PGE9.0P5, see Production Request
- CC9\_3 - Configuration Code for TISAgrid Subsystem 9.0 PGE 9.3P2, see CM database
- SW9\_5 - Software Configuration Code for TISAgrid Subsystem 9.0, PGE9.0P5, see Production Request
- DATA9\_5 - Data Configuration Code for TISAgrid Subsystem 9.0, PGE9.0P5, see Production Request
- PGE - CER9.0P5
- PROD - no
- Input ArchiveSS - \$CERESHOME/tisa\_grid/data

### 5.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 5.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **3.2 GB**  
 Total Run Time: **2 hours**

### 5.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

## 5.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 5.3.1 Input Dataset Name (#1): SFC

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/SFCB/\${SS9}\_\${PS9\_3}/yyyy/mm/  
 CER\_SFCB\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymmZnnn, nnn = 001..180**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER9.3P2**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**  
 d. File Disposition after successful execution: **N/A**  
 e. Typical file size (MB): **65**

### 5.3.2 Input Dataset Name (#2): SSFS-Day

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$CERESHOME/tisa\_grid/data/scr/yyyy/mm/  
 CER\_SSFS-Day\_\${SS9\_4}\_\${PS9\_4}\_\${CC9\_4}.yyyymmdd**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER9.0P4**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove (data and .met files)**
- e. Typical file size (MB): **1750**

## 5.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **run\_9.0P5.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **CER9\_0P5\_Env.pm**, then executing the **CER9.0P5\_pcf\_gen.pl**.

### 5.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P5\_pcf\_gen.pl**, is executed using `yyyymm` and `satname` as command line arguments.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P5/rcf
> CER9.0P5_pcf_gen.pl -date yyyymm -satellite satname -clean
```

The following file will be generated in `$CERESHOME/tisa_grid/CER9.0P5/rcf/pcf:`  
**CER9.0P5\_PCF\_\${SS9\_5}\_\${PS9\_5}\_\${CC9\_5}.yyyymm**

### 5.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run\_9.0P5.pl**, followed by the newly created PCF file name as a command line argument.

**To Run at the command line:**

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P5/rcf
> $CERESHOME/tisa_grid/CER9.0P5/rcf/run_9.0P5.csh
   ${SS9_5}_${PS9_5}_${CC9_5}.yyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.0P5/rcf
>CER9.0P5-SGE_Driver.pl -date yyyymm -satellite satname -clean
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P5/rcf
> CER9.0P5-SGE_Driver.pl -start yyyyymm -end yyyyymm -satellite satname -
  clean
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (P6 or x86) (This one will be implemented for a later delivery)</b>
<b>[-date yyyyymm]</b>	<b>Run the job for the data year and month specified by yyyyymm</b>
<b>[-start yyyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyyymm]</b>	<b>ending year/month in multiple sequential months' process</b>
<b>[-satellite satname]</b>	<b>Satellite to process. either terra or aqua.</b>
<b>[-test test_case]</b>	<b>Run as a test for day 1 only (for test plan)</b>

### 5.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 5.4.4 File Cleanup for a Failed Job

The following commands can be run following an unsuccessful job execution to remove all created output files associated with the job. This should be used with great care:

At the command line (>) type:

**For Terra:**

```
rm -f $DataArchive/scr2/$data_year/$data_month/*Terra*
rm -f $DataArchive/NB2BB_coeff_dir/$data_year/$data_month/*Terra*
rm -f $DataArchive/flx-by-cld/$data_year/$data_month/*Terra*
```

**For Aqua:**

```
rm -f $DataArchive/scr2/$data_year/$data_month/*Aqua*
rm -f $DataArchive/NB2BB_coeff_dir/$data_year/$data_month/*Aqua*
rm -f $DataArchive/flx-by-cld/$data_year/$data_month/*Aqua*
```

### 5.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P5 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 5.5 Execution Evaluation

### 5.5.1 Exit Codes

The processor CER9.0P5 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 5.5.1. Other Exit Codes may appear

from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 5.1.1) for assistance.

Table 5-5. Exit Codes for CER9.0P5

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 5.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.0P5\_pcf\_gen.pl**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 5.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: **CER9.0P5\_LogReport\_{SS9\_5}\_{PS9\_5}\_{CC9\_5}.yyyymm**

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: **CER9.0P5\_LogStatus\_{SS9\_5}\_{PS9\_5}\_{CC9\_5}.yyyymm**

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for ‘\_F\_’, fatal message type. The responsible person should be advised.

#### 3. User Log File: **CER9.0P5\_LogUser\_{SS9\_5}\_{PS9\_5}\_{CC9\_5}.yyyymm**

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.

### 5.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.0P5 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### **5.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)**

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

#### b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

### **5.6 Expected Output Dataset(s)**

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 5-6. Expected Output File Listing for CER9.0P5

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER_FlxByCld-lwwn-lnd-day-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.02	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-lnd-day-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.02	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-lnd-nit-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.02	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-lnd-nit-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.02	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-ocn-day-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.005	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-ocn-day-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.005	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-ocn-nit-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.005	1/mth	N/A	Archive, rm	No
CER_FlxByCld-lwwn-ocn-nit-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.005	1/mth	N/A	Archive, rm	No
CER_FlxByCld-sw-lnd-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	1.15	1/mth	N/A	Archive, rm	No
CER_FlxByCld-sw-lnd-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	1.15	1/mth	N/A	Archive, rm	No
CER_FlxByCld-sw-ocn-cld_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.22	1/mth	N/A	Archive, rm	No
CER_FlxByCld-sw-ocn-clr_\${SS9_5}_\${PS9_5}.yyyymm(.met)@(\$CERESHOMe/tisa_grid/data/NB2BB_coeff_dir/yyyy/mm)	m	.22	1/mth	N/A	Archive, rm	No
CER9.0P5_PCF_\${SS9_5}_\${PS9_5}_\${CC9_5}.yyyymm@(\$CERESHOMe/tisa_grid/CER9.0P5/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P5_PCF_\${SS9_5}_\${PS9_5}_\${CC9_5}.yyyymm.log@(\$CERESHOMe/tisa_grid/CER9.0P5/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P5_LogReport_\${SS9_5}_\${PS9_5}_\${CC9_5}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No

Table 5-6. Expected Output File Listing for CER9.0P5

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P5_LogStatus_\${SS9_5}_\${PS9_5}_\${CC9_5}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P5_LogUser_\${SS9_5}_\${PS9_5}_\${CC9_5}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_FluxByCloudTyp_\${SS9_5}_\${PS9_5}_\${CC9_5}. yyyymmdd.nc(.met)@(\$CERESHOME/tisa_grid/data/ flx-by-cld/yyyy/mm)	m	14	28..31 /mth	N/A	DPO, Archive, rm	Yes

a. See Section 5.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
dd - 2-digit day {valid values: 01 .. 31}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour

## 5.7 Expected Temporary Files/Directories

Table 5-7. Temporary Files Listing

Directory	File Name
\$CERESHOME/tisa_grid/data/scr2/yyyy/mm	CER_SFCD_\${SS9}_\${PS9_3}_\${CC9_3}.yyyymm
\$CERESHOME/tisa_grid/data/scr2/yyyy/mm	CER_FlxByCldTemp_\${SS9_5}_\${PS9_5}_\${CC9_5}.yyyymm.bin

## 6.0 PGENAME: CER9.0P6 Edition4 CldTypHistB-GEO product.

This PGE CER9.0P6 reads pixel level cloud data from the GEO Satellites' image files. The pixels are assigned to a regional hour box based on GMT time associated with it. The pixels in each regional hour box are averaged and written to zonal files.

### 6.1 PGE Details

#### 6.1.1 Responsible Persons

Table 6-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Alice Fan
Organization	SSAI	SSAI
Address	One Enterprise Parkway	One Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	(757) 951-1673	(757) 951-1640
Fax	(757) 951-1600	(757) 951-1600
LaRC email	<a href="mailto:rajalekshmy.I.Raju@nasa.gov">rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:tai-fang.fan-1@nasa.gov">tai-fang.fan-1@nasa.gov</a>

#### 6.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in [Table 6-1](#).

#### 6.1.3 Parent PGE(s)

Table 6-2. Parent PGEs for CER9.0P6

PGENAME	Description
N/A	

#### 6.1.4 Target PGE(s)

CER9.0P7

## 6.2 Operating Environment

### 6.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

The following runtime parameters are used when setting up a job.

Table 6-3. Runtime Parameters for CER9.0P6

Parameter	Description	Data Type	Valid Values
dataYear (yyyy)	Data year	4-digit	valid year number
dataMonth (mm)	Data month	2-digit	01-12

### 6.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

There is no subsystem-specific environment script that needs executing for the GGEO Subsystem. A Langley TRMM Information System (LaTIS) start-up script with the following environment variable definitions should be sourced prior to GGEO job setup.

**SS9\_0G**            **Sampling Strategy, PGE CER9.0P6**  
**PS9\_0**            **Production Strategy, PGE CER9.0P6**  
**CC9\_0**            **Configuration Code, PGE CER9.0P6**  
**SW9\_0**            **Software SCCR#, PGE CER9.0P6**  
**DATA9\_0**        **Data SCCR#, PGE CER9.0P6**  
**PGE**                **CER9.0P6**  
**PROD**             **yes**  
**InputArchive**    **Directory from which to read the input data products.**  
                          **If PROD is yes InputArchive /ASDC\_archive/CERES.**  
**OutputArchive**   **Directory for writing the output data products.**

### 6.2.3 Execution Frequency (daily, hourly, or monthly)

Once per month.

### 6.2.4 Memory/Disk Space/Time Requirements

**Memory:**            **300 MB**  
**Disk Space:**        **2 GB**  
**Total Run Time:** **4 hours**

### 6.2.5 Restrictions Imposed in Processing Order

Not applicable.

## 6.3 Processor Dependencies (Previous PGEs, Ingest Data)

*Note: Include required .met files, header files, .. all required inputs*

### 6.3.1 Input Dataset Name (#1): GEO

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/GEO/Edition4/YYYY/DDD**

**CER\_GEO\_Ed4\_{\$SAT}\_{\$hemisphere}{\$file  
version}\_{\$YYYY}.{\$DDD}.{\$HHMM}.{\$RR}K.nc**

Where

3 character SAT {e.g. MET08, MET09, GOE09, GOE10, GOE12, MTS01,  
MTS02}

2 character hemisphere {e.g. NH, SH}

3 character file version

4 digit year (YYYY)

3 digit julian day (day of year) (DDD)

4 digit hour (HHMM)

3 character resolution and unit (RR)

2 character identifies as NetCdf

1. Mandatory/Optional: **Mandatory.**
2. Time Related Dependency: **Data year and month must agree.**
3. Waiting Period: **Process when inputs are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**The satellite data streams are downloaded in real time from the University of Wisconsin Space Science and Engineering Center (SSEC) using the Man-computer Interactive Data Access System. The format data is then preprocessed through cloud algorithms to create files which are used as input to the PGE.**

- c. Alternate Data Set, if one exists (maximum waiting period):

**N/A**

- d. File Disposition after successful execution: **N/A**

- e. Typical file size (MB): **36**

## 6.4 Operating Procedures (Procedure for each part of the processor's elements)

### 6.4.1 Staging Input Files

All input files should be staged **PRIOR** to job setup.

### 6.4.2 How to Generate the PCF File

The PCF generator script uses the PCF ASCII file name as input. To generate the PCF, type the following at the command line prompt:

```
> $CERESHOME/ggeo/CER9.0P6/rcf/CER9.0P6_pcf_gen.pl yyyymm
```

This will create the following PCF in the `$CERESHOME/ggeo/CER9.0P6/rcf/pcf` directory.

```
CER9.0P6_PCF_{$SS9_0G}_{$PS9_0}_{$CC9_0}.{yyyy}{mm}
```

### 6.4.3 How to Execute the Main Processor

To execute the Main Processor, type the following at the command line prompt:

```
> $CERESHOME/tisa_grid/CER9.0P6/rcf/CER9.0P6_processor.pl PCFile
```

where **PCFile** is the name of the Main Processor PCF generated in Section 6.4.2.

### To Run using SGE:

**Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.**

```
>cd $CERESHOME/tisa_grid/CER9.0P6/rcf
>CER9.0P6-SGE_Driver.pl -date yyyymm -clean -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P6/rcf
> CER9.06-SGE_Driver.pl -start yyyymm -end yyyymm -clean -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-force]</b>	<b>Force to run the job with less than required inputs.</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (<i>x86-flex</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year/month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process.</b>

### 6.4.4 Special Case Considerations

N/A at this time.

### 6.4.5 Special Reprocessing Instructions

## 6.5 Execution Evaluation

### 6.5.1 Exit Code

CER9.0P6 terminates using the CERESlib defined EXIT code for CERES Production System as seen in [Table 6-4](#).

Table 6-4. Exit Codes for CER9.0P6

Exit Code	Definition	Action
0	Normal Exit	Proceed Normally
202	Abnormal	Check the Logfiles and take the appropriate action (see <a href="#">Appendix B</a> )

### 6.5.2 Screen Messages (Use Table format for large number of messages)

None.

### 6.5.3 Log and Status Files Results (Include ALL Log Files)

The log files contain all error and/or status messages produced by the PGE. The files are located in `$CERESHOME/ggeo/runlogs` directory.

#### 1. Report Log File: CER9.0P6\_LogReport\_{\$SS9\_0G}\_{\$PS9\_0}\_{\$CC9\_0}.{yyyy}{mm}

The Report Log File contains process-related informational messages. These messages may be strictly informative, or they may indicate a fatal condition that resulted in premature PGE termination. A list of messages is contained in [Appendix B](#).

#### 2. Status Log File: CER9.0P6\_LogStatus\_{\$SS9\_0G}\_{\$PS9\_0}\_{\$CC9\_0}.{yyyy}{mm}

The Status Log File contains all Toolkit messages with levels `{_W_, _E_, _F_, _S_, _M_, _U_, _N_, and _S_}`. These messages could be strictly informative, or they could indicate a fatal condition that resulted in premature PGE termination. The messages are self-explanatory.

#### 3. User Log File: CER9.0P6\_LogUser\_{\$SS9\_0G}\_{\$PS9\_0}\_{\$CC9\_0}.{yyyy}{mm}

The User Log File contains only those messages created by the Toolkit with levels `_U_` (user information) and `_N_` (notice). These messages are strictly informative.

### 6.5.4 Solutions to Possible Problems

A lot of problems are due to errors in the PCF file. Checking the PCF for syntax errors should be the first step when problems occur. This can be done with the `ceresutil` script in CERESlib. To check the PCF for errors, type the following at the command line prompt:

Also, verify that the input files listed in the PCF Log File are present in the input data directory.

### 6.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

**None.** All Main Processor jobs run independently of each other. The terminal failure of one job does not adversely affect the processing of other jobs.

b. Target PGE Termination  
**CER9.0P8**

**6.6 Expected Output Dataset(s)**

The Expected Output Datasets are listed below. Each PGE execution produces 120 zonal files.

Table 6-5. Expected Output File Listing for CER9.0P6

File Name/Directory <sup>a</sup>	m/o <sup>b</sup>	File Size (MB)	Freq/ PGE	Target PGE	Destination	Available Through Ordering Tool
CER_CldTypHistB_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm} Znnn @({\$CERESHOME}/tisa_grid/data/CldTypHistB/({\$SS9_0G}_{\$PS9_0})/({yyyy})/({mm})	m	36	31..150/ mth	CER9.0P8	No Archive	No
CER9.0P6_PCF_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}@({\$CERESHOME}/tisa_grid/CER9.0P6/rcf/pcf)	m	.001	1/mth	N/A	rm	No
CER9.0P6_PCF_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}.log @({\$CERESHOME}/tisa_grid/CER9.0P6/rcf/pcf)	m	.001	1/mth	N/A	rm	No
CER9.0P6_LogReport_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}@({\$CERESHOME}/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P6_LogStatus_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}@({\$CERESHOME}/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P6_LogUser_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}@({\$CERESHOME}/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P6_{SS9_0G}_{PS9_0}_{CC9_0}.{yyyy}{mm}{start_day}-{end_day}@({\$CERESHOME}/tisa_grid/sge_logs/CER9.0P6)	m	.001	1/mth	N/A	rm	No

- a. If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.
- b.
  - VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)
  - /QA - File is to be written to the DAAC designated /QA directory
  - DB - File content is to be entered into the LaTIS Database
  - rm - remove
  - yyyy - 4-digit year
  - mm - 2-digit month {valid values: 01 .. 12}
  - m - mandatory output
  - o - optional output
  - mth - month
  - start\_day - first day of the month
  - end\_day - last day of the month
  - hr - hour
  - nnn - 3-digit zone number (valid values: 030 ... {150})

**6.7 Expected Temporary Files/Directories**

Table 6-6. Temporary Files Listing

Directory	File Name
/\${\$CERESHOME}/tisa_grid/scr	<b>CER_{\$hemisphere}\${\$SAT}_{\$SS}_{\$PS}_{\$CC}.\${\$YY YY}\${\$MM}</b>

## 7.0 PGENAME: CER9.0P7 – Edition4

**CER9.0P7** - The PGE 9.0P7 Processor grids and spatially averages the footprint data from the CERES Single Satellite Cloud Pixels (SSF) data product. The footprints are assigned to a regional hour box based on GMT time associated with the footprint. The footprints in each regional hour box are averaged together and written to 180 zonal files. In addition, this processor grids and spatially averages MOA data product and written to one binary file.

### 7.1 PGE Details

#### 7.1.1 Responsible Persons

Table 7-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Alice Fan	Rajalekshmy Raju
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1640	951-1673
Fax	951-1900	951-1900
LaRC email	<a href="mailto:tai-fang.fan-1@nasa.gov">tai-fang.fan-1@nasa.gov</a>	<a href="mailto:rajalekshmy.i.raju@nasa.gov">rajalekshmy.i.raju@nasa.gov</a>

#### 7.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 7.1.1.

#### 7.1.3 Parent PGE(s)

Table 7-2. Parent PGE for CER9.0P7

PGENAME	Description
CER4.5-6.1P6	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor
CER12.1.P2	Regrid Meteorological, Ozone, and Aerosol (MOA) Subsystem

### 7.1.4 Target PGE(s)

Table 7-3. Target PGEs after CER9.0P7

PGName	Description
CER9.0P8	CldTypHist HDF data product contains GEO-MODIS derived cloud properties as a function of 9 cloud types, similar to ISCCP D2 product, where the cloud properties are stratified by pressure and optical depth. In addition, it produces CldTypHist-GEO and CldTypHist_MODIS HDF QC files.

## 7.2 Operating Environment

### 7.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 7-4. Runtime Parameters for CER9.0P7

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 - 12

### 7.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS4\_5T - Terra Instrument 1, Sampling Strategy for Inversion, see Production Request
- SS4\_5\_2T - Terra Instrument 2, Sampling Strategy for inversion, see Production Request
- SS4\_5A - Aqua Instrument 1, Sampling Strategy for Inversion, see Production Request
- SS4\_5\_2A - Aqua Instrument 2, Sampling Strategy for inversion, see Production Request
- SS12 - Sampling Strategy for Regrid MOA, see Production Request
- SS9\_0T - Output Terra Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- SS9\_0A - Output Aqua Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request

SS9_0M	- Output MOA Sampling Strategy for TISAGrid Subsystem 9.0, see Production Request
PS4_5T	- Terra Production Strategy for Inversion, see Production Request
PS4_5A	- Aqua Production Strategy for Inversion, see Production Request
PS12	- Production Strategy for Regrid MOA, see Production Request
PS9_0	- Production Strategy for TISAGrid Subsystem 9.0, PGE CER9.0P7, see Production Request
CC4_5T	- Terra Configuration Code for Inversion, see CM database
CC4_5A	- Aqua Configuration Code for Inversion, see CM database
CC12	- Configuration Code for Regrid MOA, see CM database
CC9_0	- Configuration Code for TISAGrid Subsystem 9.0, PGE CER9.0P6, see CM database
SW9_0	- Software Configuration Code for TISAGrid Subsystem 9.0, see CM database
DATA9_0	- Data Configuration Code for TISAGrid Subsystem 9.0, see CM database
SS9_0	Sampling Strategy for PCF and Log files
PGE	- CER9.0P7
PROD	- Yes
Input Archive	- /ASDC_archive/CERES

### 7.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 7.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **0.7 GB**  
 Total Run Time: **2 hours**

### 7.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

## 7.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 7.3.1 Input Dataset Name (#1): SSF - Terra

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/CERES/SSF/\${SS4\_5T}\_\${PS4\_5T}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5T}\_\${PS4\_5T}\_\${CC4\_5T}.yyyymmddhh  
 \$InputArchive/CERES/SSF/\${SS4\_5\_2T}\_\${PS4\_5T}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5T}\_\${PS4\_5T}\_\${CC4\_5T}.yyyymmddhh**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P6 (Terra)**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **400**

### 7.3.2 Input Dataset Name (#2): SSF - Aqua

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$InputArchive/CERES/SSF/\${SS4\_5A}\_\${PS4\_5A}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5A}\_\${PS4\_5A}\_\${CC4\_5A}.yyyymmddhh  
 \$InputArchive/CERES/SSF/\${SS4\_5\_2A}\_\${PS4\_5A}/\$yyyy/\$mm  
 CER\_SSF\_\${SS4\_5A}\_\${PS4\_5A}\_\${CC4\_5A}.yyyymmddhh**
  1. Mandatory/Optional: **The file of the hour being processed is mandatory starting from July 2002. From March 2000 to June 2002 these files are Optional (do not exist).**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P6 (Aqua)**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **400**

### 7.3.3 Input Dataset Name (#3): MOA

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$yyyy/\$mm  
 CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.yyyymmddhh, where dd = 01..31,  
 hh = 00 ..23**
  1. Mandatory/Optional: **These files are Mandatory.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**
  3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER12.1P2**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **8.3 per hour**

## 7.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.0P7\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the **CER9.0P7\_pcf\_gen.pl**.

### 7.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P7\_pcf\_gen.pl**, is executed using the newly created ASCII input file name as a command line argument.

#### To Run using SGE:

```
> cd $CERESHOME/tisa_grid/CER9.0P7/rcf
> CER9.0P7-SGE_Driver.pl -date yyyyymm -clean -platform cpu -satellites
sat1 sat2
```

where sat1 is Terra and sat2 is Aqua

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P7/rcf
> CER9.0P7-SGE_Driver.pl -start yyyyymm -end yyyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (<i>x86-flex</i>)</b>
<b>[-date yyyyymm]</b>	<b>Run the job for the data year and month specified by yyyyymm</b>
<b>[-start yyyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

### 7.4.2 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 7.4.3 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.0P7/rcf/clean.pl yyyyymm
```

#### 7.4.4 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P7 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 7.5 Execution Evaluation

#### 7.5.1 Exit Codes

The processor CER9.0P7 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 7.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 7.1.1) for assistance.

Table 7-5. Exit Codes for CER9.0P7

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

#### 7.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **pcf\_gen\_9.0P7.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

#### 7.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

##### 1. Report Log File: CER9.0P7\_LogReport\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyyymm

The Report Log File contains the TISA Gridding related 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

##### 2. Status Log File: CER9.0P7\_LogStatus\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

### 3. User Log File: CER9.0P7\_LogUser\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm

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.

#### 7.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.0P7 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### 7.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

#### 7.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 7-6. Expected Output File Listing for CER9.0P7

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P7_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/CER9.0P7/rcf/pcf)	m	.001	1/mth	N/A	rm	No
CER9.0P7_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm.log@(\$CERESHOMe/tisa_grid/CER9.0P7/rcf/pcf)	m	.001	1/mth	N/A	rm	No
CER9.0P7_LogReport_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P7_LogStatus_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P7_LogUser_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/runlogs)	m	.001	1/mth	N/A	rm	No
CER9.0P7_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/sge_logs/CER9.0P7)	m	.001	1/mth	N/A	rm	No
CER_CldTypHistB_\${SS9_0T}_\${PS9_0}_\${CC9_0}.yyyymmZnnn@(\$CERESHOMe/tisa_grid/data/CldTypHistB/\${SS9_0T}_\${PS9_0}/yyyy/mm	m	300	1-180/mth	CER9.0P8	No Archive	No
CER_CldTypHistB_\${SS9_0A}_\${PS9_0}_\${CC9_0}.yyyymmZnnn@(\$CERESHOMe/tisa_grid/data/CldTypHistB/\${SS9_0A}_\${PS9_0}/yyyy/mm	o <sup>c</sup>	17	1-180/mth	CER9.0P8	No Archive	No
CER_CldTypHistB_\${SS9_0M}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOMe/tisa_grid/data/CldTypHistB/\${SS9_0M}_\${PS9_0}/yyyy/mm	m	887	1/mth	CER9.0P8	No Archive	No

a. See Section 7.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour  
nnn - 3-digit zone number (valid values: 001 ... {150-180})

c. These files are mandatory starting from July 2002. From March 2000 to June 2002 these files are Optional (do not exist).

## 7.7 Expected Temporary Files/Directories

Table 7-7. Temporary Files Listing

Directory	File Name
\${CERESHOME}/tisa_grid/sct/	CER_CldTypHistSSFD_\${SS9_0T}_\${PS9_0}_\${CC9_0}.yyymmdd
\${CERESHOME}/tisa_grid/sct/	CER_CldTypHistD_\${SS9_0T}_\${PS9_0}_\${CC9_0}.yyyymmdd
\${CERESHOME}/tisa_grid/sct/	CER_CldTypHistSSFD_\${SS9_0A}_\${PS9_0}_\${CC9_0}.yyymmdd
\${CERESHOME}/tisa_grid/sct/	CER_CldTypHistD_\${SS9_0A}_\${PS9_0}_\${CC9_0}.yyyymmdd

## 8.0 PGENAME: CER9.0P8 – Edition4

**CER9.0P8** - The PGE 9.0P8 creates CldTypHist HDF data product contains GEO-MODIS derived cloud properties as a function of 9 cloud types, similar to ISCCP D2 product, where the cloud properties are stratified by pressure and optical depth. In addition, it produces CldTypHist-GEO and CldTypHist\_MODIS HDF QC files.

### 8.1 PGE Details

#### 8.1.1 Responsible Persons

Table 8-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Alice Fan
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1640
Fax	951-1900	951-1900
LaRC email	<a href="mailto:rajalekshmy.raju@nasa.gov">rajalekshmy.raju@nasa.gov</a>	<a href="mailto:tai-fang.fan-1@nasa.gov">tai-fang.fan-1@nasa.gov</a>

#### 8.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 8.1.1.

#### 8.1.3 Parent PGE(s)

Table 8-2. Parent PGE for CER9.0P8

PGENAME	Description
CER9.0P7	CERES Grid Single Satellite CldTypHistB MODIS Clouds and MOA.
CER9.0P6	Geostationary Satellites' Grid CldTypHistB 5-channel Cloud data.
CER11.2P3	Sort and Merge Gridded Geostationary Narrowband Radiance, GGEO

### 8.1.4 Target PGE(s)

Table 8-3. Target PGEs after CER9.0P8

PGENAME	DESCRIPTION
N/A	N/A

## 8.2 Operating Environment

### 8.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 8-4. Runtime Parameters for CER9.0P8

Parameter	Description	Data Type	Valid Values
yyyymm	CERDataDate	I(6)	yyyy4-digit year mm 01 - 12

### 8.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS9\_0T - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P7, see Production Request for Terra
- SS9\_0A - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P7, see Production Request for Aqua
- SS9\_0M - Sampling Strategy for TISA Subsystem 9.0, PGE 9.0P7, see Production Request for MOA
- SS9\_0G - Sampling Strategy for TISA Subsystem 9.0, PGE 9.0P6, see Production Request for GEO
- SS11 - Sampling Strategy for TISA Subsystem 11, PGE 11.2P3, see Production Request
  
- SS9\_0 - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P8, see Production Request
- SS9\_0QC - Sampling Strategy for TISAgrid Subsystem 9.0, PGE 9.0P8 QC, see Production Request

PS9_0	-	Production Strategy for TISAGrid Subsystem 9.0,
PS11		Production Strategy for GGEO Subsystem 11.0
CC9_0	-	Configuration Code for TISAGrid Subsystem 9.0, see CM database
CC11	-	Configuration Code for TISA Subsystem 11, PGE 11.2P3, see CM database
SW9_0	-	Software Configuration Code for TISAGrid Subsystem 9.0, see CM database
DATA9_0	-	Data Configuration Code for TISAGrid Subsystem 9.0, see CM database
PGE	-	CER9.0P8
PROD		yes

### 8.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/month)** - This PGE is to be processed once per month, when input is available.

### 8.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **0.7 GB**  
 Total Run Time: **2 hours**

### 8.2.5 Restrictions Imposed in Processing Order

Failed input should not be staged from previous PGEs.

## 8.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 8.3.1 Input Dataset Name (#1): CldTypHistB {GEO}

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchiveSS/CldTypHistB/\${SS9\_0G}\_\${PS9\_0}/yyyy/mm/CER\_CldTypHistB\_\${SS9\_0G}\_\${PS9\_0}\_\${CC9\_0}.yyyymmznnn, where nnn = 31 .. 150**

1. Mandatory/Optional: **The file is mandatory.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER9.0P6**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**

- d. File Disposition after successful execution: **Remove**

- e. Typical file size (MB): **400**

### 8.3.2 Input Dataset Name (#2): CldTypHistB {MODIS}

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/CldTypHistB/\${SS9\_0T}\_\${PS9\_0}/yyyy/mm/  
CER\_CldTypHistB\_\${SS9\_0T}\_\${PS9\_0}\_\${CC9\_0}.yyyymmznnn**

**\$InputArchive/CldTypHistB/\${SS9\_0A}\_\${PS9\_0}/yyyy/mm/  
CldTypHistB\_\${SS9\_0A}\_\${PS9\_0}\_\${CC9\_0}.yyyymmznnn**

**Where nnn = 1 .. 180**

1. Mandatory/Optional: **The file of the hour being processed is mandatory. CldTypHistB Aqua files are Mandatory starting from July 2002. From March 2000 to June 2002 they are Optional (do not exist).**
  2. Time Related Dependency:
 

**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER9.0P7**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **400**

### 8.3.3 Input Dataset Name (#3): CldTypHistB {MOA}

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/CldTypHistB/\${SS9\_0M}\_\${PS9\_0}/yyyy/mm/  
CER\_CldTypHistB\_\${SS9\_0M}\_\${PS9\_0}\_\${CC9\_0}.yyyymm**

1. Mandatory/Optional: **The file of the hour being processed is mandatory.**
  2. Time Related Dependency:
 

**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER9.0P7**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **400**

### 8.3.4 Input Dataset Name (#4): GGEO

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$InputArchive/\${SS11}\_\${PS11}/yyyy/mm/CER\_GGEO\_\${SS11}\_\${PS11}\_\${CC11}.yyyymmFn, where n = 1 .. 4**
  1. Mandatory/Optional: **The file is mandatory.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER11.2P3**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **400**

## 8.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.0P8\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the **CER9.0P8\_pcf\_gen.pl**.

### 8.4.1 How to Generate the PCF File

The PCF generator, **CER9.0P8\_pcf\_gen.pl**, is executed using yyyymm as a command line argument.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.0P8/rcf
> CER9.0P8_pcf_gen.pl yyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.0P8/rcf/pcf:**  
**CER9.0P8\_PCF\_\${SS9\_0}\_\${PS9\_0}\_\${CC9\_0}.yyyymm**

### 8.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.0P8\_processor.pl**, followed by the newly created PCF file name as a command line argument.

**To Run using SGE:**

**Note: It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.**

```
>cd $CERESHOME/tisa_grid/CER9.0P8/rcf
>CER9_0P8-SGE_Driver.pl -date yyyymm -platform cpu -clean
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.0P8/rcf
> CER9.0P8-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

**There are several options for running jobs.**

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by CPU (<i>x86-flex</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

### 8.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 8.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.0P8/rcf/clean.pl yyyymm
```

### 8.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.0P8 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 8.5 Execution Evaluation

### 8.5.1 Exit Codes

The processor CER9.0P8 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 8.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 8.1.1) for assistance.

Table 8-5. Exit Codes for CER9.0P8

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 8.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **pcf\_gen\_9.0P8.pl**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 8.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: CER9.0P8\_LogReport\_{SS9\_0}\_{PS9\_0}\_{CC9\_0}.yyyymm

The Report Log File contains the TISA Gridding related 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

#### 2. Status Log File: CER9.0P8\_LogStatus\_{SS9\_0}\_{PS9\_0}\_{CC9\_0}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for ‘\_F\_’, fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.0P8\_LogUser\_{SS9\_0}\_{PS9\_0}\_{CC9\_0}.yyyymm

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.

### 8.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.0P8 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 8.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

## **8.6 Expected Output Dataset(s)**

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time.

Table 8-6. Expected Output File Listing for CER9.0P8

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.0P8_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/CER9.0P8/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P8_PCF_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm.log@(\$CERESHOME/tisa_grid/CER9.0P8/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P8_LogReport_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P8_LogStatus_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.0P8_LogUser_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_CldTypHist_\${SS9_0}_\${PS9_0}_\${CC9_0}.yyyymm(.met)@(\$CERESHOME/tisa_grid/data/CldTypHist/\${SS9_0}_\${PS9_0}/yyyy/mm)	m	600	1/mth	N/A	Archive, rm	Yes
CER_CldTypHistQC_\${SS9_0QC}_\${PS9_0}_\${CC9_0}.yyyymm(.met)@(\$CERESHOME/tisa_grid/data/CldTypHistQC/\${SS9_0QC}_\${PS9_0}/yyyy/mm)	m	1	1/mth	N/A	Archive, rm	No
CER_CldTypHistQC_\${SS9_0G}_\${PS9_0}_\${CC9_0}.yyyymm(.met)@(\$CERESHOME/tisa_grid/data/CldTypHistQC/\${SS9_0G}_\${PS9_0}/yyyy/mm)	m	1	1/mth	N/A	Archive, rm	No

a. See Section 8.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
m - mandatory output  
o - optional output  
mth - month  
hr - hour

## 8.7 Expected Temporary Files/Directories

Table 8-7. Temporary Files Listing

Directory	File Name

## 9.0 PGENAME: CER9.1P1 – Edition3

### CER9.1P1 - CERES Post Meteorological, Ozone, and Aerosol (PMOA) Processor

#### 9.1 PGE Details

##### 9.1.1 Responsible Persons

Table 9-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.j.wrenn@nasa.gov">Forrest.j.wrenn@nasa.gov</a>

##### 9.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 9.1.1.

##### 9.1.3 Parent PGE(s)

Table 9-2. Parent PGEs for CER9.1P1

PGENAME	Description
CER12.1.P1	Regrid Meteorological, Ozone, and Aerosol (MOA) Subsystem

### 9.1.4 Target PGE(s)

Table 9-3. Target PGEs after CER9.1P1

PGENAME	Description
CER7.3.1P1	CERES Synoptic Surface and Atmospheric Radiation Budget Subsystem 7.1 Main Processor
CER10.0P3	CERES Monthly TOA and SRB Averages Subsystem 10.0 Main Processor

## 9.2 Operating Environment

### 9.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 9-4. Runtime Parameters for CER9.1P1

Parameter	Description	Data Type	Valid Values
yyyy	CERDataYear	I(4)	yyyy 4-digit year
mm	CERDataMonth	I(2)	mm 01 - 12

### 9.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS12 - Sampling Strategy for Regrid MOA, see Production Request
- PS12 - Production Strategy for Regrid MOA, see Production Request
- CC9\_1 - Configuration Code for PMOA, see CM database
- CC12 - Configuration Code for Regrid MOA, see Production Request
- SW9 - Software Configuration Code for PMOA, see CM database
- DATA9 - Data Configuration Code for PMOA, see CM database
- PGE - CER9.1P1
- PROD - yes

- InputArchive - Directory from which to read the input data products.  
 If PROD is no InputArchive \$CERESHOME/tisa\_grid/data.  
 If PROD is yes InputArchive /ASDC\_archive/CERES.
- OutputArchive - Directory for writing the output data products.
- SKIP\_HR - The hour gap depending on the MOA grid.

### 9.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input for an entire data month is available.

### 9.2.4 Memory/Disk Space/Time Requirements

- Memory: **397 MB**  
 Disk Space: **15.5 GB**  
 Total Run Time: **7 hours, 30 minutes**

### 9.2.5 Restrictions Imposed in Processing Order

This PGE can be run when an entire month of data have been processed through PGE CER12.1P1.

## 9.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 9.3.1 Input Dataset Name (#1): MOA

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$yyyy/\$mm**  
**CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.yyyymmddhh, where dd = 01..31,**  
**hh = 00 ..23**
  1. Mandatory/Optional: **These files are Mandatory.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER12.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **8.3 per hour**

### 9.3.2 Input Dataset Name (#1): MOA (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$yyyy/\$mm**  
**CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.xyyyplldhh**

**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$yyyy/\$mm  
CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.xyyynmfdhh**

**12 hours where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 12 .. 23**

**12 hours where xyyynmfd equals the year, month, and day corresponding to the First day of the following month and the hours hh = 00 .. 11**

1. Mandatory/Optional: **These files are mandatory, if they exist.**
  2. Time Related Dependency:
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER12.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
  - d. File Disposition after successful execution: **NA**
  - e. Typical file size (MB): **8.3 per hour**

#### **9.4 Operating Procedures (Procedure for each part of the processor's elements)**

The Post-MOA processor script, **CER9.1P1\_processor.pl**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the PCF generator, **CER9.1P1\_pcf\_gen.pl**.

##### **9.4.1 How to Generate the PCF File**

The PCF generator, **pcf\_gen\_9.1P1.pl**, is executed using the year,month as a command line arguments.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.1P1/rcf
> CER9.1P1_pcf_gen.pl yyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.1P1/rcf/pcf:**

```
CER9.1P1_PCF_${SS12}_${PS12}_${CC9_1}.yyyymm
CER9.1P1_PCF_${SS12}_${PS12}_${CC9_1}.yyyymm.log
```

##### **9.4.2 How to Execute the Main Processor**

Execute the production script by typing the script name, **CER9.1P1\_processor.pl**, followed by the newly created PCF file name as a command line argument.

**To Run at the command line:**

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.1P1/rcf
> set PCFDIR = $CERESHOME/tisa_grid/CER9.1P1/rcf/pcf
> $CERESHOME/tisa_grid/CER9.1P1/rcf/CER9.1P1_processor.pl
   $PCFDIR/CER9.1P1_PCF_${SS12}_${PS12}_${CC9_1}.yyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.1P1/rcf
>CER9.1P1-SGE_Driver.pl -d yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.1P1/rcf
> CER9.1P1-SGE_Driver.pl -start yyyymm -end yyyymm

> cd $CERESHOME/tisa_grid/CER9.1P1/rcf
> CER9.1P1-SGE_Driver.pl -date yyyymm
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.1P1/rcf
> CER9.1P1-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platforma designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>end year/month in multiple sequential months' process.</b>

**9.4.3 Special Case Considerations**

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

**9.4.4 File Cleanup for a Failed Job**

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care.

At the command line (>) type:

> \$CERESHOME/tisa\_grid/CER9.1P1/rcf/clean.pl yyyymm

#### 9.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.1P1 software. All output files must be removed before reprocessing.

### 9.5 Execution Evaluation

#### 9.5.1 Exit Codes

The processor CER9.1P1 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 9.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 9.1.1) for assistance.

Table 9-5. Exit Codes for CER9.1P1

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

#### 9.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.1P1\_pcf\_gen.pl**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

#### 9.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

##### 1. Report Log File: CER9.1P1\_LogReport\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

##### 2. Status Log File: CER9.1P1\_LogStatus\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for ‘\_F\_’, fatal message type. The responsible person should be advised.

### 3. User Log File: CER9.1P1\_LogUser\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm

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.

#### 9.5.4 Solutions to Possible Problems

As mentioned in Section 9.4.5, all output files are opened with Status = NEW in PGE CER9.1P1 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### 9.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

b. Target PGE Termination

If any of the `.met` files are missing from the expected output, this condition must terminate all further Target PGE processing.

#### 9.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and create 4 output files.

Table 9-6. Expected Output File Listing for CER9.1P1

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.1P1_PCF_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm@(\$CERESHOME/tisa_grid/CER9.1P1/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.1P1_PCF_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm.log@(\$CERESHOME/tisa_grid/CER9.1P1/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.1P1_LogReport_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER9.1P1_LogStatus_\${SS12}_\${PS12}_\${CC9_1}.yyyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER9.1P1_LogUser_\${SS12}_\${PS12}_\${CC9_1}.yyyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER_PMOA_\${SS12}_\${PS12}_\${CC9_1}.yyyyymmFn(.met) @(\$CERESHOME/tisa_grid/data/PMOA/\${SS12}_\${PS12}/ yyyy/mm)	m	5673.9	4/mth	CER7.3.1P1 CER10.0P3	DPO, Archive, rm	No

a. See Section 9.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)

/QA - File is to be written to the DAAC designated /QA directory

DB - File content is to be entered into the LaTIS Database

rm - remove

yyyy - 4-digit year

mm - 2-digit month { valid values: 01 .. 12 }

n - number of files { valid values: 1 .. 4 }

m - mandatory output

o - optional output

mth - month

## 9.7 Expected Temporary Files/Directories

Table 9-7. Temporary Files Listing

Directory	File Name
\${CERESHOME}/tisa_grid/sct/	SED_yyyyyymm
\${CERESHOME}/tisa_grid/sct/	MOA_FILES_yyyyyymm
\${CERESHOME}/tisa_grid/sct/	PMOA_FILES_yyyyyymm
\${CERESHOME}/tisa_grid/sct/	PMOA_MET_FILES_yyyyyymm

## 10.0 PGENAME: CER9.1P2 – Edition4

### CER9.1P2 - CERES Post Meteorological, Ozone, and Aerosol (PMOA) Processor

#### 10.1 PGE Details

##### 10.1.1 Responsible Persons

Table 10-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 10.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [10.1.1](#).

##### 10.1.3 Parent PGE(s)

Table 10-2. Parent PGEs for CER9.1P2

PGENAME	Description
CER12.1.P2	Regrid Meteorological, Ozone, and Aerosol (MOA) Subsystem

### 10.1.4 Target PGE(s)

Table 10-3. Target PGEs after CER9.1P2

PGENAME	Description
CER7.3.1P3 CER7.3.1P4	CERES Synoptic Surface and Atmospheric Radiation Budget Subsystem 7.1 Main Processor
CER10.0P5	CERES Monthly TOA and SRB Averages Subsystem 10.0 Main Processor

## 10.2 Operating Environment

### 10.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 10-4. Runtime Parameters for CER9.1P2

Parameter	Description	Data Type	Valid Values
Yyyy	CERDataYear	I(4)	yyyy 4-digit year
Mm	CERDataMonth	I(2)	mm 01 - 12

### 10.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable.csh**' and it uses the following environment variables expected to be set by the ASDC:

- SS12 - Sampling Strategy for Regrid MOA, see Production Request
- PS12 - Production Strategy for Regrid MOA, see Production Request
- CC9\_1 - Configuration Code for PMOA, see CM database
- CC12 - Configuration Code for Regrid MOA, see Production Request
- SW9 - Software Configuration Code for PMOA, see CM database
- DATA9 - Data Configuration Code for PMOA, see CM database
- PGE - CER9.1P2
- PROD - yes
- InputArchive - Directory from which to read the input data products.  
If PROD is no InputArchive \$CERESHOME/tisa\_grid/data.  
If PROD is yes InputArchive /ASDC\_archive/CERES.
- OutputArchive - Directory for writing the output data products.
- SKIP\_HR - The hour gap depending on the MOA grid.

### 10.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input for an entire data month is available.

### 10.2.4 Memory/Disk Space/Time Requirements

Memory: **397 MB**  
 Disk Space: **15.5 GB**  
 Total Run Time: **~30 minutes**

### 10.2.5 Restrictions Imposed in Processing Order

This PGE can be run when an entire month of data have been processed through PGE CER12.1P2.

## 10.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 10.3.1 Input Dataset Name (#1): MOA

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$yyyy/\$mm**  
**CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.yyyyymmddhh, where dd = 01..31,**  
**hh = 00 ..23**

**\$InputArchive/MOA/\${SS12}\_\${PS12}/\$xyyyy/\$xmm**  
**CER\_MOA\_\${SS12}\_\${PS12}\_\${CC12}.xyyyxmmxddxhh, where xyyyxmm =**  
**following year and month, xdd = 01, xhh = 00**

1. Mandatory/Optional: **These files are Mandatory.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER12.1P2**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **8.3 per hour**

## 10.4 Operating Procedures (Procedure for each part of the processor's elements)

The Post-MOA processor script, **CER9.1P2\_processor.pl**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable.csh**, then executing the PCF generator, **CER9.1P2\_pcf\_gen.pl**.

### 10.4.1 How to Generate the PCF File

The PCF generator, **pcf\_gen\_9.1P2.pl**, is executed using the year,month as a command line arguments.

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.1P2/rcf
> CER9.1P2_pcf_gen.pl yyyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.1P1/rcf/pcf**:

```
CER9.1P2_PCF_${SS12}_${PS12}_${CC9_1}.yyyyymm
CER9.1P2_PCF_${SS12}_${PS12}_${CC9_1}.yyyyymm.log
```

### 10.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.1P2\_processor.pl**, followed by the newly created PCF file name as a command line argument.

**To Run at the command line:**

At the command line (>) type:

```
> cd $CERESHOME/tisa_grid/CER9.1P2/rcf
> set PCFDIR = $CERESHOME/tisa_grid/CER9.1P2/rcf/pcf
> $CERESHOME/tisa_grid/CER9.1P2/rcf/CER9.1P2_processor.pl
   $PCFDIR/CER9.1P2_PCF_${SS12}_${PS12}_${CC9_1}.yyyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.1P2/rcf
>CER9.1P2-SGE_Driver.pl -d yyyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.1P2/rcf
> CER9.1P2-SGE_Driver.pl -start yyyyymm -end yyyyymm

> cd $CERESHOME/tisa_grid/CER9.1P2/rcf
> CER9.1P2-SGE_Driver.pl -date yyyyymm
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.1P2/rcf
> CER9.1P2-SGE_Driver.pl -start yyyyymm -end yyyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platforma designated by CPU (<i>x86</i>)</b>
<b>[-date yyyyymm]</b>	<b>Run the job for the data year and month specified by yyyyymm</b>
<b>[-start yyyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyyymm]</b>	<b>end year/month in multiple sequential months' process.</b>

### 10.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 10.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.1P2/rcf/clean.pl yyyyymm
```

### 10.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.1P2 software. All output files must be removed before reprocessing.

## 10.5 Execution Evaluation

### 10.5.1 Exit Codes

The processor CER9.1P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 10.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 10.1.1) for assistance.

Table 10-5. Exit Codes for CER9.1P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 10.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.1P2\_pcf\_gen.pl**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 10.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: **CER9.1P2\_LogReport\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm**

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: **CER9.1P2\_LogStatus\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm**

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for ‘\_F\_’, fatal message type. The responsible person should be advised.

#### 3. User Log File: **CER9.1P2\_LogUser\_\${SS12}\_\${PS12}\_\${CC9\_1}.yyyymm**

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.

### 10.5.4 Solutions to Possible Problems

As mentioned in Section [10.4.5](#), all output files are opened with Status = NEW in PGE CER9.1P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 10.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

#### b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

## 10.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and create 4 output files.

Table 10-6. Expected Output File Listing for CER9.1P2

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.1P2_PCF_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm@(\$CERESHOME/tisa_grid/CER9.1P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.1P2_PCF_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm.log@(\$CERESHOME/tisa_grid/CER9.1P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.1P2_LogReport_\${SS12}_\${PS12}_\${CC9_1}. yyyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER9.1P2_LogStatus_\${SS12}_\${PS12}_\${CC9_1}.yyyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER9.1P2_LogUser_\${SS12}_\${PS12}_\${CC9_1}.yyyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.005	1/mth	N/A	Archive, rm	No
CER_PMOA_\${SS12}_\${PS12}_\${CC9_1}.yyyyymmFn(.met) @(\$CERESHOME/tisa_grid/data/PMOA/\${SS12}_\${PS12}/ yyyy/mm)	m	5673.9	4/mth	CER7.1.1P1 CER8.1P1 CER10.1P1	DPO, Archive, rm	No

a. See Section 10.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year  
 mm - 2-digit month { valid values: 01 .. 12 }  
 n - number of files { valid values: 1 .. 4 }  
 m - mandatory output  
 o - optional output  
 mth - month

## 10.7 Expected Temporary Files/Directories

Table 10-7. Temporary Files Listing

Directory	File Name
\$(CERESHOME)/tisa_grid/sct/	SED_yyyyyymm
\$(CERESHOME)/tisa_grid/sct/	MOA_FILES_yyyyyymm
\$(CERESHOME)/tisa_grid/sct/	PMOA_FILES_yyyyyymm
\$(CERESHOME)/tisa_grid/sct/	PMOA_MET_FILES_yyyyyymm

## 11.0 PGENAME: CER9.2P2

### CER9.2P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor

#### 11.1 PGE Details

##### 11.1.1 Responsible Persons

Table 11-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 11.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [11.1.1](#).

##### 11.1.3 Parent PGE(s)

Table 11-2. Parent PGEs for CER9.2P2

PGENAME	Description
CER4.5-6.1P1	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

### 11.1.4 Target PGE(s)

Table 11-3. Target PGEs after CER9.2P2

PGENAME	Description
CER9.3P2	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

## 11.2 Operating Environment

### 11.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 11-4. Runtime Parameters for CER9.2P2

Parameter	Description	Data Type	Valid Values
yyyymmddhh	CERDataDate	I(10)	yyyy 4-digit year mm 01 - 12 dd 01 - 31 hh 00 - 23

### 11.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS4\_5 - Instrument 1 Sampling Strategy for Inversion, see Production Request
- SS4\_5\_2 - Instrument 2 Sampling Strategy for Inversion, see Production Request
- SS9 - Sampling Strategy for TISAGrid Subsystem 9.0, see Production Request
- PS4\_5 - Production Strategy for Inversion, see Production Request
- PS9 - Production Strategy for TISAGrid Subsystem 9.0, PGE CER9.2P2, see Production Request
- CC4\_5 - Configuration Code for Inversion, see CM database
- CC9 - Configuration Code for TISAGrid Subsystem 9.0, PGE CER9.2P2, see CM database
- SW9 - Software Configuration Code for TISAGrid Subsystem 9.0, see CM database
- DATA9 - Data Configuration Code for TISAGrid Subsystem 9.0, see CM database
- PGE - CER9.2P2
- PROD - Yes

- InputArchive - Directory from which to read the input data products.  
 If PROD is no InputArchive **\$CERESHOME/tisa\_grid/data**.  
 If PROD is yes InputArchive **/ASDC\_archive/CERES**.
- OutputArchive - Directory for writing the output data products.

### 11.2.3 Execution Frequency (daily, hourly, or monthly)

**hourly (1/hr)** - This PGE is to be processed once per data hour, a maximum total of 744 hours per month, when input is available.

### 11.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **5.7 GB**  
 Total Run Time: **6 - 12 minutes**

### 11.2.5 Restrictions Imposed in Processing Order

Last 12 hours of the month must be run sequentially, noon to midnight. Failed input should not be staged from previous PGEs.

## 11.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 11.3.1 Input Dataset Name (#1): SSFB

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/SSFB/\${SS4\_5}\_\${PS4\_5}/yyyy/mm/  
 CER\_SSFB\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddhh, where dd = 01..31,  
 hh = 00..23**

**\$InputArchive/SSFB/\${SS4\_5}\_\${PS4\_5}/yyyy/mm/  
 CER\_SSFB\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddHH, where dd = 01..31,  
 HH = hh+1**

1. Mandatory/Optional: **The file of the hour being processed is mandatory, if they exist, and the file of the next hour is optional.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER4.5-6.1P1**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **130.0 per hour**

### 11.3.2 Input Dataset Name (#1): SSFB (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh+1
```

```
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh+1
```

12 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 12 .. 23

12 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 11

1. Mandatory/Optional: **These files are mandatory, if they exist.**
  2. Time Related Dependency:
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
  - d. File Disposition after successful execution: **N/A**
  - e. Typical file size (MB): **130.0 per hour**

### 11.3.3 Input Dataset Name (#2): SSFA

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/mm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddhh, where dd = 01..31,
hh = 00..23
```

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/mm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddHH, where dd = 01..31,
HH = hh+1
```

1. Mandatory/Optional: **These files are not available for TRMM data. For Terra and Aqua processing, the file of the hour being processed is mandatory, and the file of the next hour is optional.**
2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**

3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **15.0 per hour**

#### 11.3.4 Input Dataset Name (#2): SSFA (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh+1
```

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh+1
```

**12 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 12 .. 23**

**12 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 11**

1. Mandatory/Optional: **These files are not available for TRMM data. For Terra and Aqua processing, the files are mandatory, if they exist.**
2. Time Related Dependency:
3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **15.0 per hour**

#### 11.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.2P2\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, **env-variable\_Terra.csh**, or **env-variable\_Aqua.csh** depending on the processing satellite then executing the pcf script **CER9.2P2\_pcf\_gen.pl**.

### 11.4.1 How to Generate the PCF File

The PCF generator, `CER9.2P2_pcf_gen.pl`, is executed using year,month,day,hour as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.2P2/rcf/CER9.2P2_pcf_gen.pl
  yyyyymmddhh
```

The following file will be generated in `$CERESHOME/tisa_grid/CER9.2P2/rcf/pcf`:

```
CER9.2P2_PCF_${SS9}_${PS9}_${CC9}.yyyyymmddhh
```

### 11.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, `tisa_grid-9_main_processor.csh`, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.2P2/rcf/pcf
> $CERESHOME/tisa_grid/CER9.2P2/rcf/CER9.2P2_processor.pl
  $PCFDIR/CER9.2P2_PCF_${SS9}_${PS9}_${CC9}.yyyyymmddhh
```

### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.2P2/rcf
>CER9.2P2-SGE_Driver.pl -date yyyyymmdd -hour hh -platform cpu
```

To run multiple sequential hours:

```
> cd $CERESHOME/tisa_grid/CER9.2P2/rcf
> CER9.2P2-SGE_Driver.pl -date yyyyymmdd -start_hour hh -end_hour hh
  yyyyymm -platform cpu
```

**There are options for running jobs.**

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered.</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymmdd]</b>	<b>Run the job for the year/month/day specified by yyyymmdd</b>
<b>[-hour hh]</b>	<b>Run one hour job specified by hh</b>
<b>[-start_hour hh]</b>	<b>Starting Hour specified by hh</b>
<b>[-end_hour hh]</b>	<b>Ending Hour specified by hh</b>

### 11.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 11.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.2P2/rcf/clean.pl yyyymmddhh
```

### 11.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.2P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 11.5 Execution Evaluation

### 11.5.1 Exit Codes

The processor CER9.2P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 11.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 11.1.1) for assistance.

Table 11-5. Exit Codes for CER9.2P2

<b>Exit Code</b>	<b>Definition</b>	<b>Action</b>
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 11.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, CER9.2P2\_pcf\_gen.pl, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 11.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: \$CERESHOME/tisa\_grid/runlogs.

#### 1. Report Log File: CER9.2P2\_LogReport\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: CER9.2P2\_LogStatus\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.2P2\_LogUser\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

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.

### 11.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.2P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 11.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

#### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

#### b. Target PGE Termination

If any of the .met files are missing from the expected output, this condition must terminate all further Target PGE processing.

## 11.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 744 times, maximum, in a 31 day month. In addition, the PGE is expected to process a maximum of 12 times, once each for the last twelve hours of the previous month, and a maximum of 12 times, once each for the first twelve hours of the following month.

Table 11-6. Expected Output File Listing for CER9.2P2

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.2P2_PCF_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh @(\$CERESHOME/tisa_grid/CER9.2P2/rcf/pcf)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P2_PCF_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh.log @(\$CERESHOME/tisa_grid/CER9.2P2/rcf/pcf)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P2_LogReport_\${SS9}_\${PS9}_\${CC9}. yyyymmddhh@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P2_LogStatus_\${SS9}_\${PS9}_\${CC9}. yyyymmddhh@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P2_LogUser_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh @(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER_SFC-HR_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh(.met) @(\$CERESHOME/tisa_grid/data/SFC- HR/\${SS9}_\${PS9}/yyyy/mm)	m	10.4	1/hr	CER9.3P2	Archive	No
CER_MOVLP_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh(.met) <sup>c</sup> @(\$CERESHOME/tisa_grid/data/MOVLP/\${SS9}_\${PS9}/ yyyy/mm)	m/o	8.8	24/mnt h	CER9.3P2	Archive <sup>c</sup>	No
CER_MRGRP_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh(.met) @(\$CERESHOME/tisa_grid/data/MRGRP/\${SS9}_\${PS9}/ yyyy/mm)	o	1	1/hr	N/A	Archive, rm	No

a. See Section 11.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year  
 mm - 2-digit month {valid values: 01 .. 12}  
 dd - 2-digit day {valid values: 01 .. 31}  
 hh - 2-digit hour of the day {valid values: 00 .. 23}  
 m - mandatory output  
 o - optional output  
 mth - month  
 hr - hour

c. CER\_MOVLP\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh(.met). These overlap files get generated for the first 12 hours and the last 12 hours of the current month process. In addition overlap files get generated for the last 12 hours of the previous month (xyyypmld) and the first 12 hours of the next month (xyyymfd) process. These previous month and the next month overlap files (24) are expected to be included in the current month PGE CER9.3P2 process. If any of the overlap files have been previously created, either from the previous month or the next month processing, then they will not be created again. See Section 11.3.2 for the detail description. See Section 11.4.5 for reprocessing instructions. Archive at the End of Data Month (EOD).

## 11.7 Expected Temporary Files/Directories

Table 11-7. Temporary Files Listing

<b>Directory</b>	<b>File Name</b>
N/A	N/A

## 12.0 PGENAME: CER9.3P2

### CER9.3P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

#### 12.1 PGE Details

##### 12.1.1 Responsible Persons

Table 12-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 12.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [12.1.1](#).

##### 12.1.3 Parent PGE(s)

Table 12-2. Parent PGEs for CER9.3P2

PGENAME	Description
CER9.2P2	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor

### 12.1.4 Target PGE(s)

Table 12-3. Target PGEs after CER9.3P2

PGENAME	Description
CER9.4P2	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor
CER10.0P3 CER7.3.1P1	CERES Monthly TOA and SRB Averages Subsystem 10.0 Main Processor

## 12.2 Operating Environment

### 12.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 12-4. Runtime Parameters for CER9.3P2

Parameter	Description	Data Type	Valid Values
yyyy	CERDataYear	I(4)	yyyy 4-digit year
mm	CERDataMonth	I(2)	mm 01 - 12

### 12.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS9 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS9 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.2P2, see Production Request
- PS9\_3 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.3P2, see Production Request
- CC9 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.2P2, see CM database
- CC9\_3 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.3P2, see CM database
- SW9 - Software Configuration Code for TISAgrid Subsystem 9.0, see CM database
- DATA9 - Data Configuration Code for TISAgrid Subsystem 9.0, see CM database

- PGE - CER9.3P2  
 PROD - no  
 InputArchive - Directory from which to read the input data products.  
                   If PROD is no InputArchive **\$CERESHOME/tisa\_grid/data**.  
                   If PROD is yes InputArchive **/ASDC\_archive/CERES**.  
 OutputArchive - Directory for writing the output data products.

### 12.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input for an entire data month is available.

### 12.2.4 Memory/Disk Space/Time Requirements

- Memory:           **484 MB**  
 Disk Space:       **18 GB**  
 Total Run Time:   **14 minutes**

### 12.2.5 Restrictions Imposed in Processing Order

This PGE can be run when at least one hour of data have been processed through PGE CER9.2P2.

## 12.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 12.3.1 Input Dataset Name (#1): SFC-HR

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$CERESHOME/tisa\_grid/data/SFC-HR/\${SS9}\_\${PS9}/yyyy/mm/  
 CER\_SFC-HR\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh, where dd = 01..31 and  
 hh = 00..23**
  1. Mandatory/Optional: **At least one input dataset or one MOVLP file must exist.**
  2. Time Related Dependency:  
 The Runtime Parameter: **yyyy,mm. must match the yyyymm on the input dataset name. All DataSet(s) for this year and month are expected, if they exist.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.2P2**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **10.4 per hour (total of 744 hours)**

### 12.3.2 Input Dataset Name (#2): MOVLP (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$CERESHOME/tisa_grid/data/MOVLP/${SS9}_${PS9}/xyyy/pm/
CER_MOVLP_${SS9}_${PS9}_${CC9}.xyyypldhh
$CERESHOME/tisa_grid/data/MOVLP/${SS9}_${PS9}/xyyy/nm/
CER_MOVLP_${SS9}_${PS9}_${CC9}.xyyynmfdhh
```

12 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 12 .. 23

12 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 11

1. Mandatory/Optional: **These files are mandatory, if file exists.**
  2. Time Related Dependency: N/A
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.2P2**
- c. Alternate Data Set, if one exists (maximum waiting period): N/A
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **8.8 per hour (total of 24 hours)**

### 12.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Post processor script, **CER9.3P2\_processor.csh**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, 'env-variable\_Terra.csh', OR 'env-variable\_Aqua.csh' depending on the processing satellite, then executing the PCF generator, **CER9.3P2\_pcf\_gen.pl**.

#### 12.4.1 How to Generate the PCF File

The PCF generator, **CER9.3P2\_pcf\_gen.pl**, is executed using yyyymm as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.3P2/rcf/CER9.3P2_pcf_gen.pl $yyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.3P2/rcf/pcf**:

```
CER9.3P2_PCF_${SS9}_${PS9}_3_${CC9}_3.yyyymm
```

#### 12.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.3P2\_processor.pl**, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.3P2/rcf/pcf
> $CERESHOME/tisa_grid/CER9.3P2/rcf/CER9.3P2_processor.pl
   $PCFDIR/CER9.3P2_PCF_${SS9}_${PS9_3}_${CC9_3}.yyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.3P2/rcf
>CER9.3P2-SGE_Driver.pl -date yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.3P2/rcf
> CER9.3P2-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-force]</b>	<b>Force to run the job with less than required inputs.</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by <i>CPU</i> (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year/month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process.</b>

### 12.4.3 Special Case Considerations

-force option is primarily to use in SSIT testing environment. In production process this option should be used only after contacting the responsible person (see Section 12.1.1) for assistance.

Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 12.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/rcf/clean.pl yyyymm
```

### 12.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.3P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a

change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 12.5 Execution Evaluation

### 12.5.1 Exit Codes

The processor CER9.3P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 12.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 12.1.1) for assistance.

Table 12-5. Exit Codes for CER9.3P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 12.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, CER9.3P2\_pcf\_gen.csh, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 12.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: \$CERESHOME/tisa\_grid/runlogs.

#### 1. Report Log File: CER9.3P2\_LogReport\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: CER9.3P2\_LogStatus\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.3P2\_LogUser\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

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.

### 12.5.4 Solutions to Possible Problems

As mentioned in Section 12.4.4, all output files are opened with Status = NEW in PGE CER9.3P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

### 12.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing. If all zonal files aren't available, continue processing.

## 12.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and will create from 1 to 180 zonal files.

Table 12-6. Expected Output File Listing for CER9.3P2

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.3P2_PCF_\${SS9}_\${PS9_3}_\${CC9_3}.yyyymm @(\$CERESHOME/tisa_grid/CER9.3P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P2_PCF_\${SS9}_\${PS9_3}_\${CC9_3}.yyyymm. log@(\$CERESHOME/tisa_grid/CER9.3P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P2_LogReport_\${SS9}_\${PS9_3}_\${CC9_3}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P2_LogStatus_\${SS9}_\${PS9_3}_\${CC9_3}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P2_LogUser_\${SS9}_\${PS9_3}_\${CC9_3}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_SFCB_\${SS9}_\${PS9_3}_\${CC9_3}.yyyymmZnnn (.met)@(\$CERESHOME/tisa_grid/data/SFCB/\${SS9}_ \${PS9_3}/yyyy/mm)	m	7738	1..180/ mth	CER9.4P2, 7.3.1P1, 10.0P3, 10.0P4	DPO, Archive	No
CER_MQCRP_\${SS9}_\${PS9_3}_\${CC9_3}.yyyymm (.met)@(\$CERESHOME/tisa_grid/data/MQCRP/\${SS9}_ \${PS9_3}/yyyy/mm)	o	1	1/mth	N/A	Archive, rm	No

a. See Section 12.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)
- /QA - File is to be written to the DAAC designated /QA directory
- DB - File content is to be entered into the LaTIS Database
- rm - remove
- yyyy - 4-digit year
- mm - 2-digit month {valid values: 01 .. 12}
- dd - 2-digit day {valid values: 01 .. 31}
- hh - 2-digit hour of the day {valid values: 00 .. 23}
- nnn - 3-digit zone number {valid values: 001 .. 180}
- m - mandatory output
- o - optional output
- month - month

## 12.7 Expected Temporary Files/Directories

Table 12-7. Temporary Files Listing

Directory	File Name
\${CERESHOME}/tisa_grid/scr	CER_SFCD_\${SS9}_\${PS9_3}_\${CC9_3}. yyyymmdd

### 13.0 PGENAME: CER9.4P2

#### CER9.4P2 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor

### 13.1 PGE Details

#### 13.1.1 Responsible Persons

Table 13-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

#### 13.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [13.1.1](#).

#### 13.1.3 Parent PGE(s)

Table 13-2. Parent PGEs for CER9.4P2

PGENAME	Description
CER9.3P2	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

#### 13.1.4 Target PGE(s)

N/A

## 13.2 Operating Environment

### 13.2.1 Runtime Parameters

Table 13-3. Runtime Parameters for CER9.4P2

Parameter	Description	Data Type	Valid Values
yyyy	CERDataYear	I(4)	yyyy 4-digit year
mm	CERDataMonth	I(2)	mm 01 - 12

### 13.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS9 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS9\_3 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.3P2, see Production Request
- PS9 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.4P2, see Production Request
- CC9\_3 - Configuration Code for TISAgrid Subsystem 9.0 PGE 9.3P2, see CM database
- CC9\_4 - Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P2, see CM database
- SW9 - Software Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P2, see CM database
- DATA9 - Data Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P2, see CM database
- PGE - CER9.4P2
- PROD - no
- InputArchive - Directory from which to read the input data products.  
If PROD is no InputArchive \$CERESHOME/tisa\_grid/data.  
If PROD is yes InputArchive /ASDC\_archive/CERES.
- OutputArchive - Directory for writing the output data products

### 13.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input is available.

### 13.2.4 Memory/Disk Space/Time Requirements

Memory: **105 MB**  
 Disk Space: **12 GB**  
 Total Run Time: **~10 hours**

### 13.2.5 Restrictions Imposed in Processing Order

This PGE can be run immediately following the successful completion of PGE CER9.3P2.

## 13.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 13.3.1 Input Dataset Name (#1): SFCB

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$CERESHOME/tisa\_grid/data/SFCB/\${SS9}\_\${PS9\_3}/yyyy/mm  
 CER\_SFCB\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymmZnnn, nnn = 001..180**
  1. Mandatory/Optional: **These files are Mandatory if they exist.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm. All available zones, maximum of 180, for this year and month are expected.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.3P2**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **7738.0 (total of 180 files)**

## 13.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 HDF Postprocessor script, **CER9.4P2\_processor.pl**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite, then executing the PCF generator, **CER9.4P2\_pcf\_gen.pl**.

### 13.4.1 How to Generate the PCF File

The PCF generator, **CER9.4P2\_pcf\_gen.pl**, is executed using yyyymm as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.4P2/rcf/CER9.4P2_pcf_gen.pl $yyyymm
```

The following file will be generated in `$CERESHOME/tisa_grid/CER9.4P2/rcf/pcf`:

**CER9.4P2\_PCF\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm**

### 13.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, `CER9.4P2_processor.csh`, followed by the newly created PCF file name as a command line argument.

#### To Run at the command line:

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.4P2/rcf/pcf
> $CERESHOME/tisa_grid/CER9.4P2/rcf/CER9.4P2_processor.csh
   $PCFDIR/CER9.4P2_PCF_${SS9}_${PS9}_${CC9_4}.yyyymm
```

#### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.4P2/rcf
>CER9.4P2-SGE_Driver.pl -date yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.4P2/rcf
> CER9.4P2-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year and month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process..</b>

### 13.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 13.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.4P2/rcf/clean.pl yyyyymm
```

### 13.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.4P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 13.5 Execution Evaluation

### 13.5.1 Exit Codes

The processor CER9.4P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 13.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 13.1.1) for assistance

Table 13-4. Exit Codes for CER9.4P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 13.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, CER9.4P2\_pcf\_gen.pl, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 13.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: \$CERESHOME/tisa\_grid/runlogs.

#### 1. Report Log File: CER9.4P2\_LogReport\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: CER9.4P2\_LogStatus\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

### 3. User Log File: CER9.4P2\_LogUser\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm

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.

#### 13.5.4 Solutions to Possible Problems

As mentioned in Section 13.4.4, all output files are opened with Status = NEW in PGE CER9.4P2 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### 13.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

b. Target PGE Termination

N/A

#### 13.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and at most, create 18 files containing 10 zones of data in each file for TRMM and create 36 files containing 5 zones of data in each file for Terra/Aqua.

Table 13-5. Expected Output File Listing for CER9.4P2

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CCER9.4P2_PCF_\${SS9}_\${PS9}_\${CC9_4}.yyyymm @(\$CERESHOME/tisa_grid/CER9.4P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P2_PCF_\${SS9}_\${PS9}_\${CC9_4}.yyyymm.log @(\$CERESHOME/tisa_grid/CER9.4P2/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P2_LogReport_\${SS9}_\${PS9}_\${CC9_4}.yyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P2_LogStatus_\${SS9}_\${PS9}_\${CC9_4}.yyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P2_LogUser_\${SS9}_\${PS9}_\${CC9_4}.yyyymm @(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_SFC_\${SS9}_\${PS9}_\${CC9_4}.yyyymmZnn(.met) @(\$CERESHOME/tisa_grid/data/out_comp/data/SFC_hdf)	m	7738	1..18/mnth for TRMM 1..36/mnth for Terra/Aqua	N/A	Archive, rm	Yes

a. See Section 13.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year  
 mm - 2-digit month {valid values: 01 .. 12}  
 dd - 2-digit day {valid values: 01 .. 31}  
 hh - 2-digit hour of the day {valid values: 00 .. 23}  
 nn - 2-digit number {valid values: 01 .. 18 for TRMM; 1..36 for Terra}  
 m - mandatory output  
 o - optional output  
 mth - month

## 13.7 Expected Temporary Files/Directories

Table 13-6. Temporary Files Listing

Directory	File Name
N/A	N/A

## 14.0 PGENAME: CER9.2P3 – Edition4

### CER9.2P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor

#### 14.1 PGE Details

##### 14.1.1 Responsible Persons

Table 14-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 14.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [14.1.1](#).

##### 14.1.3 Parent PGE(s)

Table 14-2. Parent PGEs for CER9.2P3

PGENAME	Description
CER4.5-6.1P1	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor

### 14.1.4 Target PGE(s)

Table 14-3. Target PGEs after CER9.2P3

PGENAME	DESCRIPTION
CER9.3P3	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

## 14.2 Operating Environment

### 14.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 14-4. Runtime Parameters for CER9.2P3

Parameter	Description	Data Type	Valid Values
Yyyymmddhh	CERDataDate	I(10)	yyyy 4-digit year mm 01 - 12 dd 01 - 31 hh 00 - 23

### 14.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named **'env-variable\_Terra.csh'**, OR **'env-variable\_Aqua.csh'** depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS4\_5 - Instrument 1 Sampling Strategy for Inversion, see Production Request
- SS4\_5\_2 - Instrument 2 Sampling Strategy for Inversion, see Production Request
- SS9 - Sampling Strategy for TISAgriid Subsystem 9.0, see Production Request
- PS4\_5 - Production Strategy for Inversion, see Production Request
- PS9 - Production Strategy for TISAgriid Subsystem 9.0, PGE CER9.2P3, see Production Request
- CC4\_5 - Configuration Code for Inversion, see CM database
- CC9 - Configuration Code for TISAgriid Subsystem 9.0, PGE CER9.2P3, see CM database
- SW9 - Software Configuration Code for TISAgriid Subsystem 9.0, see CM database
- DATA9 - Data Configuration Code for TISAgriid Subsystem 9.0, see CM database
- PGE - CER9.2P3
- PROD - Yes

- InputArchive - Directory from which to read the input data products.  
 If PROD is no InputArchive **\$CERESHOME/tisa\_grid/data**.  
 If PROD is yes InputArchive **/ASDC\_archive/CERES**.
- OutputArchive - Directory for writing the output data products.

### 14.2.3 Execution Frequency (daily, hourly, or monthly)

**hourly (1/hr)** - This PGE is to be processed once per data hour, a maximum total of 744 hours per month, when input is available.

### 14.2.4 Memory/Disk Space/Time Requirements

Memory: **128 MB**  
 Disk Space: **5.7 GB**  
 Total Run Time: **1-2 minutes**

### 14.2.5 Restrictions Imposed in Processing Order

Last 12 hours of the month must be run sequentially, noon to midnight. Failed input should not be staged from previous PGEs.

## 14.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 14.3.1 Input Dataset Name (#1): SSFB

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

**\$InputArchive/SSFB/\${SS4\_5}\_\${PS4\_5}/yyyy/mm/  
 CER\_SSFB\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddhh, where dd = 01..31,  
 hh = 00..23**

**\$InputArchive/SSFB/\${SS4\_5}\_\${PS4\_5}/yyyy/mm/  
 CER\_SSFB\_\${SS4\_5}\_\${PS4\_5}\_\${CC4\_5}.yyyymmddHH, where dd = 01..31,  
 HH = hh+1**

1. Mandatory/Optional: **The file of the hour being processed is mandatory, if they exist, and the file of the next hour is optional.**

2. Time Related Dependency:

**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**

3. Waiting Period: **None, process when all input data are available.**

- b. Source of Information (Source is PGE name or Ingest Source):

**Source PGE: CER4.5-6.1P1**

- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **N/A**
- e. Typical file size (MB): **130.0 per hour**

### 14.3.2 Input Dataset Name (#1): SSFB (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh+1
```

```
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh
$InputArchive/SSFB/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFB_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh+1
```

24 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 00 .. 23

24 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 23

1. Mandatory/Optional: **These files are mandatory, if they exist.**
  2. Time Related Dependency:
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):
- Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
  - d. File Disposition after successful execution: **N/A**
  - e. Typical file size (MB): **130.0 per hour**

### 14.3.3 Input Dataset Name (#2): SSFA

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/mm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddhh, where dd = 01..31,
hh = 00..23
```

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/mm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.yyyymmddHH, where dd = 01..31,
HH = hh+1
```

1. Mandatory/Optional: **These files are not available for TRMM data. For Terra and Aqua processing, the file of the hour being processed is mandatory, and the file of the next hour is optional.**

2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm,dd,hh.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
  - d. File Disposition after successful execution: **N/A**
  - e. Typical file size (MB): **15.0 per hour**

#### 14.3.4 Input Dataset Name (#2): SSFA (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/pm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyypmldhh+1
```

```
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh
$InputArchive/SSFA/${SS4_5}_${PS4_5}/yyyy/nm/
CER_SSFA_${SS4_5}_${PS4_5}_${CC4_5}.xyyynmfdhh+1
```

**24 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 00 .. 23**

**24 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 23**

1. Mandatory/Optional: **These files are not available for TRMM data. For Terra and Aqua processing, the files are mandatory, if they exist.**
  2. Time Related Dependency:
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER4.5-6.1P1**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
  - d. File Disposition after successful execution: **N/A**
  - e. Typical file size (MB): **15.0 per hour**

#### 14.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Main Processor script, **CER9.2P3\_processor.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is

created by first sourcing the TISAgrid specific environment script, **env-variable\_Terra.csh**, or **env-variable\_Aqua.csh** depending on the processing satellite then executing the pcf script **CER9.2P3\_pcf\_gen.pl**.

#### 14.4.1 How to Generate the PCF File

The PCF generator, **CER9.2P3\_pcf\_gen.pl**, is executed using year,month,day,hour as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.2P3/rcf/CER9.2P3_pcf_gen.pl yyyymmddhh
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.2P3/rcf/pcf:**  
**CER9.2P3\_PCF\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh**

#### 14.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **tisa\_grid-9\_main\_processor.csh**, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.2P3/rcf/pcf
> $CERESHOME/tisa_grid/CER9.2P3/rcf/CER9.2P3_processor.pl
   $PCFDIR/CER9.2P3_PCF_${SS9}_${PS9}_${CC9}.yyyymmddhh
```

#### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.2P3/rcf
>CER9.2P3-SGE_Driver.pl -date yyyymmdd -hour hh -platform cpu
```

To run multiple sequential hours:

```
> cd $CERESHOME/tisa_grid/CER9.2P3/rcf
> CER9.2P3-SGE_Driver.pl -date yyyymmdd -start_hour hh -end_hour hh yyyymm
   -platform cpu
```

There are options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered.</b>
<b>[-platform CPU]</b>	<b>Run the PGE on the platform designated by CPU (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymmdd]</b>	<b>Run the job for the year/month/day specified by yyyymmdd</b>
<b>[-hour hh]</b>	<b>Run one hour job specified by hh</b>

**[-start\_hour hh]                      Starting Hour specified by hh**  
**[-end\_hour hh]                        Ending Hour specified by hh**

### 14.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 14.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.2P3/rcf/clean.pl yyyymmddhh
```

### 14.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.2P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 14.5 Execution Evaluation

### 14.5.1 Exit Codes

The processor CER9.2P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 14.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 14.1.1) for assistance.

Table 14-5. Exit Codes for CER9.2P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 14.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.2P3\_pcf\_gen.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 14.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

### 1. Report Log File: CER9.2P3\_LogReport\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

### 2. Status Log File: CER9.2P3\_LogStatus\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

### 3. User Log File: CER9.2P3\_LogUser\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh

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.

#### 14.5.4 Solutions to Possible Problems

All output files are opened with Status = NEW in PGE CER9.2P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### 14.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

##### a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time. If one hour fails, continue processing the next hour.

##### b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing.

## 14.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 744 times, maximum, in a 31 day month. In addition, the PGE is expected to process a maximum of 24 times, once each for the last twelve hours of the previous month, and a maximum of 24 times, once each for the first twelve hours of the following month.

Table 14-6. Expected Output File Listing for CER9.2P3

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.2P3_PCF_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh @(\$CERESHOME/tisa_grid/CER9.2P3/rcf/pcf)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P3_PCF_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh.log @(\$CERESHOME/tisa_grid/CER9.2P3/rcf/pcf)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P3_LogReport_\${SS9}_\${PS9}_\${CC9}. yyyymmddhh@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P3_LogStatus_\${SS9}_\${PS9}_\${CC9}. yyyymmddhh@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER9.2P3_LogUser_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh @(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/hr	N/A	Archive, rm	No
CER_SSF1deg-HR_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh (.met)@(\$CERESHOME/tisa_grid/data/SSF1deg-HR/ \${SS9}_\${PS9}/yyyy/mm)	m	10.4	1/hr	CER9.3P3	Archive	No
CER_MRGRP_\${SS9}_\${PS9}_\${CC9}.yyyymmddhh(.met) @(\$CERESHOME/tisa_grid/data/MRGRP/\${SS9}_\${PS9}/ yyyy/mm)	o	1	1/hr	N/A	Archive, rm	No

a. See Section 14.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year  
 mm - 2-digit month {valid values: 01 .. 12}  
 dd - 2-digit day {valid values: 01 .. 31}  
 hh - 2-digit hour of the day {valid values: 00 .. 23}  
 m - mandatory output  
 o - optional output  
 mth - month  
 hr - hour

## 14.7 Expected Temporary Files/Directories

Table 14-7. Temporary Files Listing

Directory	File Name
N/A	N/A

## 15.0 PGENAME: CER9.3P3 – Edition4

### CER9.3P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

#### 15.1 PGE Details

##### 15.1.1 Responsible Persons

Table 15-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 15.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section [15.1.1](#).

##### 15.1.3 Parent PGE(s)

Table 15-2. Parent PGEs for CER9.3P3

PGENAME	Description
CER9.2P3	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Main Processor

### 15.1.4 Target PGE(s)

Table 15-3. Target PGEs after CER9.3P3

PGENAME	Description
CER9.4P3	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor
CER7.3.1P3 CER7.3.1P4 CER10.0P5	CERES Monthly TOA and SRB Averages Subsystem 10.0 Main Processor

## 15.2 Operating Environment

### 15.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 15-4. Runtime Parameters for CER9.3P3

Parameter	Description	Data Type	Valid Values
yyyy	CERDataYear	I(4)	yyyy 4-digit year
mm	CERDataMonth	I(2)	mm 01 - 12

### 15.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS9 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS9 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.2P3, see Production Request
- PS9\_3 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.3P3, see Production Request
- CC9 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.2P3, see CM database
- CC9\_3 - Configuration Code for TISAgrid Subsystem 9.0, PGE CER9.3P3, see CM database
- SW9 - Software Configuration Code for TISAgrid Subsystem 9.0, see CM database
- DATA9 - Data Configuration Code for TISAgrid Subsystem 9.0, see CM database

- PGE - CER9.3P3  
 PROD - no  
 InputArchive - Directory from which to read the input data products.  
                   If PROD is no InputArchive **\$CERESHOME/tisa\_grid/data**.  
                   If PROD is yes InputArchive **/ASDC\_archive/CERES**.  
 OutputArchive - Directory for writing the output data products.

### 15.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input for an entire data month is available.

### 15.2.4 Memory/Disk Space/Time Requirements

- Memory:           **484 MB**  
 Disk Space:       **18 GB**  
 Total Run Time: **14 minutes**

### 15.2.5 Restrictions Imposed in Processing Order

This PGE can be run when at least one hour of data have been processed through PGE CER9.2P3.

## 15.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 15.3.1 Input Dataset Name (#1): SSF1deg-HR

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$CERESHOME/tisa\_grid/data/SSF1deg-HR/\${SS9}\_\${PS9}/yyyy/mm/  
 CER\_SSF1deg-HR\_\${SS9}\_\${PS9}\_\${CC9}.yyyymmddhh, where dd = 01..31 and  
 hh = 00..23**
  1. Mandatory/Optional: **At least one file must exist.**
  2. Time Related Dependency:  
 The Runtime Parameter: **yyyy,mm. must match the yyyy,mm on the input dataset name. All DataSet(s) for this year and month are expected, if they exist.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.2P3**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **10.4 per hour (total of 744 hours)**

### 15.3.2 Input Dataset Name (#2): (Overlap hours)

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):

```
$CERESHOME/tisa_grid/data/SSF1deg-HR/${SS9}_${PS9}/xyyy/pm/
CER_SSF1deg-HR_${SS9}_${PS9}_${CC9}.xyyypmldhh
$CERESHOME/tisa_grid/data/SSF1deg-HR/${SS9}_${PS9}/xyyy/nm/
CER_SSF1deg-HR_${SS9}_${PS9}_${CC9}.xyyynmfdhh
```

**24 files where xyyypmld equals the year, month, and day corresponding to the Last day of the previous month and the hours hh = 00 .. 23**

**24 files where xyyynmfd equals the year, month, and day corresponding to the First day of the next month and the hours hh = 00 .. 23**

1. Mandatory/Optional: **These files are mandatory, if file exists.**
  2. Time Related Dependency: **N/A**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.2P3**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **8.8 per hour (total of 24 hours)**

## 15.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 Post processor script, **CER9.3P3\_processor.csh**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite, then executing the PCF generator, **CER9.3P3\_pcf\_gen.pl**.

### 15.4.1 How to Generate the PCF File

The PCF generator, **CER9.3P3\_pcf\_gen.pl**, is executed using **yyyymm** as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.3P3/rcf/CER9.3P3_pcf_gen.pl $yyyymm
```

The following file will be generated in **\$CERESHOME/tisa\_grid/CER9.3P3/rcf/pcf:**  
**CER9.3P3\_PCF\_\${SS9}\_\${PS9}\_3\_\${CC9}\_3.yyyymm**

### 15.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **CER9.3P3\_processor.pl**, followed by the newly created PCF file name as a command line argument.

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.3P3/rcf/pcf
> $CERESHOME/tisa_grid/CER9.3P3/rcf/CER9.3P3_processor.pl
  $PCFDIR/CER9.3P3_PCF_${SS9}_${PS9_3}_${CC9_3}.yyyymm
```

**To Run using SGE:**

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.3P3/rcf
>CER9.3P3-SGE_Driver.pl -date yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.3P3/rcf
> CER9.3P3-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<b>[-clean]</b>	<b>Delete any existing outputs that are encountered</b>
<b>[-force]</b>	<b>Force to run the job with less than required inputs.</b>
<b>[-platform <i>CPU</i>]</b>	<b>Run the PGE on the platform designated by <i>CPU</i> (<i>P6</i> or <i>x86</i>)</b>
<b>[-date yyyymm]</b>	<b>Run the job for the data year/month specified by yyyymm</b>
<b>[-start yyyymm]</b>	<b>starting year/month in multiple sequential months' process</b>
<b>[-end yyyymm]</b>	<b>ending year/month in multiple sequential months' process.</b>

### 15.4.3 Special Case Considerations

-force option is primarily to use in SSIT testing environment. In production process this option should be used only after contacting the responsible person (see Section 15.1.1) for assistance.

Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

### 15.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/rcf/clean.pl yyyymm
```

### 15.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.3P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a

change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 15.5 Execution Evaluation

### 15.5.1 Exit Codes

The processor CER9.3P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 15.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 15.1.1) for assistance.

Table 15-5. Exit Codes for CER9.3P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 15.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.3P3\_pcf\_gen.csh**, the system message, “No match,” may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 15.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: CER9.3P3\_LogReport\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: CER9.3P3\_LogStatus\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for ‘\_F\_’, fatal message type. The responsible person should be advised.

#### 3. User Log File: CER9.3P3\_LogUser\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymm

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.

#### **15.5.4 Solutions to Possible Problems**

As mentioned in Section 15.4.5, all output files are opened with Status = NEW in PGE CER9.3P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### **15.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)**

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

b. Target PGE Termination

If any of the **.met** files are missing from the expected output, this condition must terminate all further Target PGE processing. If all zonal files aren't available, continue processing.

#### **15.6 Expected Output Dataset(s)**

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and will create from 1 to 180 zonal files and maximum number of days of month.

Table 15-6. Expected Output File Listing for CER9.3P3

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.3P3_PCF_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mm@(\$CERESHOME/tisa_grid/CER9.3P3/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P3_PCF_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mm.log@(\$CERESHOME/tisa_grid/CER9.3P3/rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P3_LogReport_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P3_LogStatus_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.3P3_LogUser_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_SSF1degB_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mmZnn(.met)@(\$CERESHOME/tisa_grid/data/SSF1degB/\${SS9}_\${PS9_3}/yyyy/mm)	m	7738	1..180/mth	CER7.3.1P3, 7.3.1P4, 10.0P5	DPO, Archive	No
CER_SSF1degD_\${SS9}_\${PS9_3}_\${CC9_3}.yyyy mmDdd(.met)@(\$CERESHOME/tisa_grid/data/SSF1degD/\${SS9}_\${PS9_3}/yyyy/mm)	m	31	31/mth	CER9.4P3	DPO, Archive	No

a. See Section 15.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
/QA - File is to be written to the DAAC designated /QA directory  
DB - File content is to be entered into the LaTIS Database  
rm - remove  
yyyy - 4-digit year  
mm - 2-digit month {valid values: 01 .. 12}  
dd - 2-digit day {valid values: 01 .. 31}  
hh - 2-digit hour of the day {valid values: 00 .. 23}  
nnn - 3-digit zone number {valid values: 001 .. 180}  
m - mandatory output  
o - optional output  
mth - month

## 15.7 Expected Temporary Files/Directories

Table 15-7. Temporary Files Listing

Directory	File Name
N/A	N/A

## 16.0 PGENAME: CER9.4P3

### CER9.4P3 - CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 HDF Postprocessor

#### 16.1 PGE Details

##### 16.1.1 Responsible Persons

Table 16-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Rajalekshmy Raju	Forrest Wrenn
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1673	951-1981
Fax	951-1900	951-1900
LaRC email	<a href="mailto:Rajalekshmy.I.Raju@nasa.gov">Rajalekshmy.I.Raju@nasa.gov</a>	<a href="mailto:Forrest.J.Wrenn@nasa.gov">Forrest.J.Wrenn@nasa.gov</a>

##### 16.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Section 16.1.1.

##### 16.1.3 Parent PGE(s)

Table 16-2. Parent PGEs for CER9.4P3

PGENAME	Description
CER9.3P3	CERES Grid TOA and Surface Fluxes for Instantaneous Surface Product Subsystem 9.0 Postprocessor

##### 16.1.4 Target PGE(s)

N/A

## 16.2 Operating Environment

### 16.2.1 Runtime Parameters

Table 16-3. Runtime Parameters for CER9.4P3

Parameter	Description	Data Type	Valid Values
yyyy	CERDataYear	I(4)	yyyy 4-digit year
mm	CERDataMonth	I(2)	mm 01 - 12

### 16.2.2 Environment Script Requirements

Refer to the CERES internal paper (Reference 1) for a detailed description of the CERES environment parameters.

One Environment Script is required. It is named '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite and it uses the following environment variables expected to be set by the ASDC:

- SS9 - Sampling Strategy for TISAgrid Subsystem 9.0, see Production Request
- PS9\_3 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.3P3, see Production Request
- PS9 - Production Strategy for TISAgrid Subsystem 9.0, PGE CER9.4P3, see Production Request
- CC9\_3 - Configuration Code for TISAgrid Subsystem 9.0 PGE 9.3P3, see CM database
- CC9\_4 - Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P3, see CM database
- SW9 - Software Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P3, see CM database
- DATA9 - Data Configuration Code for TISAgrid Subsystem 9.0 PGE 9.4P3, see CM database
- PGE - CER9.4P3
- PROD - no
- InputArchive - Directory from which to read the input data products.  
If PROD is no InputArchive \$CERESHOME/tisa\_grid/data.  
If PROD is yes InputArchive /ASDC\_archive/CERES.
- OutputArchive - Directory for writing the output data products

### 16.2.3 Execution Frequency (daily, hourly, or monthly)

**monthly (1/mth)** - This PGE is to be processed once per month when input is available.

### 16.2.4 Memory/Disk Space/Time Requirements

Memory: **105 MB**  
 Disk Space: **12 GB**  
 Total Run Time: **~10 hours**

### 16.2.5 Restrictions Imposed in Processing Order

This PGE can be run immediately following the successful completion of PGE CER9.3P3.

## 16.3 Processor Dependencies (Previous PGEs, Ingest Data)

### 16.3.1 Input Dataset Name (#1): SSF1degD

- a. Directory Location/Inputs Expected (Including .met files, header files, etc.):  
**\$CERESHOME/tisa\_grid/data/SSF1degD/\${SS9}\_\${PS9\_3}/yyyy/mm  
 CER\_SSF1degD\_\${SS9}\_\${PS9\_3}\_\${CC9\_3}.yyyymmDnn, nn = 01..31**
  1. Mandatory/Optional: **These files are Mandatory if they exist.**
  2. Time Related Dependency:  
**These data must match the Runtime Parameter: yyyy,mm. All available files, maximum of 31, for this year and month are expected.**
  3. Waiting Period: **None, process when all input data are available.**
- b. Source of Information (Source is PGE name or Ingest Source):  
**Source PGE: CER9.3P3**
- c. Alternate Data Set, if one exists (maximum waiting period): **N/A**
- d. File Disposition after successful execution: **Remove**
- e. Typical file size (MB): **7738.0 (total of 31 files)**

## 16.4 Operating Procedures (Procedure for each part of the processor's elements)

The Subsystem 9.0 HDF Postprocessor script, **CER9.4P3\_processor.pl**, references a PCF which contains the correct file names and paths for the PGE. This PCF is created by first sourcing the TISAgrid specific environment script, '**env-variable\_Terra.csh**', OR '**env-variable\_Aqua.csh**' depending on the processing satellite, then executing the PCF generator, **CER9.4P3\_pcf\_gen.pl**.

### 16.4.1 How to Generate the PCF File

The PCF generator, **CER9.4P3\_pcf\_gen.pl**, is executed using yyyyymm as a command line argument.

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.4P3/rcf/CER9.4P3_pcf_gen.pl $yyyyymm
```

The following file will be generated in `$CERESHOME/tisa_grid/CER9.4P3/rcf/pcf:`  
**CER9.4P3\_PCF\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm**

#### 16.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, `CER9.4P3_processor.csh`, followed by the newly created PCF file name as a command line argument.

##### To Run at the command line:

At the command line (>) type:

```
> set PCFDIR = $CERESHOME/tisa_grid/CER9.4P3/rcf/pcf
> $CERESHOME/tisa_grid/CER9.4P3/rcf/CER9.4P3_processor.csh
   $PCFDIR/CER9.4P3_PCF_${SS9}_${PS9}_${CC9_4}.yyyymm
```

##### To Run using SGE:

**Note:** It is not necessary to manually create the PCF as described above when submitting a job using the SGE submission script.

```
>cd $CERESHOME/tisa_grid/CER9.4P3/rcf
>CER9.4P3-SGE_Driver.pl -date yyyymm -platform cpu
```

To run multiple sequential months:

```
> cd $CERESHOME/tisa_grid/CER9.4P3/rcf
> CER9.4P3-SGE_Driver.pl -start yyyymm -end yyyymm -platform cpu
```

There are several options for running jobs.

<code>[-clean]</code>	Delete any existing outputs that are encountered
<code>[-platform CPU]</code>	Run the PGE on the platform designated by CPU ( <i>P6</i> or <i>x86</i> )
<code>[-date yyyymm]</code>	Run the job for the data year and month specified by yyyymm
<code>[-start yyyymm]</code>	starting year/month in multiple sequential months' process
<code>[-end yyyymm]</code>	ending year/month in multiple sequential months' process

#### 16.4.3 Special Case Considerations

N/A, at this time. Special case considerations will be handled on a case-by-case basis, where special instructions will accompany each special request.

#### 16.4.4 File Cleanup for a Failed Job

The clean script can be run following an unsuccessful job execution to remove all created files associated with the job, including output. This script should be used with great care:

At the command line (>) type:

```
> $CERESHOME/tisa_grid/CER9.4P3/rcf/clean.pl yyyymm
```

### 16.4.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in PGE CER9.4P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

## 16.5 Execution Evaluation

### 16.5.1 Exit Codes

The processor CER9.4P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Section 16.5.1. Other Exit Codes may appear from the program, which may be the result of a system, compiler, or Toolkit related error. In these cases, contact the responsible person (see Section 16.1.1) for assistance

Table 16-4. Exit Codes for CER9.4P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see <a href="#">Appendix B</a> ).

### 16.5.2 Screen Messages (Use Table format for large number of messages)

When running the PCF generation script, **CER9.4P3\_pcf\_gen.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove a file that does not exist. This does not signify a problem.

### 16.5.3 Log and Status Files Results (Include ALL Log Files)

The Log files contain all error and/or status messages produced by the PGE. The files are located in directory: **\$CERESHOME/tisa\_grid/runlogs**.

#### 1. Report Log File: CER9.4P3\_LogReport\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm

The Report Log File contains the TISA Gridding related 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). A comprehensive list of these messages, that can be generated during the execution of the PGE, is contained in [Appendix B](#).

#### 2. Status Log File: CER9.4P3\_LogStatus\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm

The Status Log File contains all messages created by the Toolkit. If an abnormal exit is encountered by the PGE, this file should be examined for '\_F\_', fatal message type. The responsible person should be advised.

### 3. User Log File: CER9.4P3\_LogUser\_\${SS9}\_\${PS9}\_\${CC9\_4}.yyyymm

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.

#### 16.5.4 Solutions to Possible Problems

As mentioned in Section 16.4.5, all output files are opened with Status = NEW in PGE CER9.4P3 software. The PGE script has been designed to check for these files and to delete them prior to execution, but in the case of a change in the file permission status, the ASDC must take appropriate action. These files must be removed before reprocessing.

#### 16.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing)

a. Subsystem Termination

There are no foreseeable PGE terminating conditions at this time.

b. Target PGE Termination

N/A

#### 16.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 1 time per month and at most, create maximum of 31 daily HDF files, each file containing all zones of data per day.

Table 16-5. Expected Output File Listing for CER9.4P3

File Name <sup>a</sup> /Directory	m/o	File Size (MB)	Freq/PGE	Target PGE	Destination <sup>b</sup>	Available Through Ordering Tool
CER9.4P3_PCF_\${SS9}_\${PS9}_\${CC9_4}. yyyymm@(\$CERESHOME/tisa_grid/CER9.4P3/ rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P3_PCF_\${SS9}_\${PS9}_\${CC9_4}. yyyymm.log@(\$CERESHOME/tisa_grid/CER9.4P3/ rcf/pcf)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P3_LogReport_\${SS9}_\${PS9}_\${CC9_4}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P3_LogStatus_\${SS9}_\${PS9}_\${CC9_4}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER9.4P3_LogUser_\${SS9}_\${PS9}_\${CC9_4}. yyyymm@(\$CERESHOME/tisa_grid/runlogs)	m	.001	1/mth	N/A	Archive, rm	No
CER_SSF1deg-Hour_\${SS9}_\${PS9}_\${CC9_4}. yyyymmdd(.met)@(\$CERESHOME/tisa_grid/data/ SSF1deg-Hour/_\${SS9}_\${PS9}/\${yyyy}/\${mm})	m	7738	1..31/mnth for Terra/Aqua/ NPP	N/A	Archive, rm	Yes

a. See Section 16.2 for information on variable data values

If “(.met)” is written next to an expected Output Filename, then the metadata file **must** exist with the identical filename and .met extension.

- b. VD - Validation Days in 1998 (Jan./5, 12, 19, 26/, Apr./6, 13, 20, 27/, July/6, 13, 20, 27/, Oct./5, 12, 19, 26/)  
 /QA - File is to be written to the DAAC designated /QA directory  
 DB - File content is to be entered into the LaTIS Database  
 rm - remove  
 yyyy - 4-digit year  
 mm - 2-digit month {valid values: 01 .. 12}  
 dd - 2-digit day {valid values: 01 .. 31}  
 hh - 2-digit hour of the day {valid values: 00 .. 23}  
 m - mandatory output  
 o - optional output  
 mth - month

## 16.7 Expected Temporary Files/Directories

Table 16-6. Temporary Files Listing

Directory	File Name
N/A	N/A

## References

1. Reference "Proposal for Semi-Automated Sampling Strategy, Production Strategy, and Configuration Code Implementation" internal paper for detail description of the CERES environment parameters. [http://ceres.larc.nasa.gov/intern\\_docs.php](http://ceres.larc.nasa.gov/intern_docs.php)

## Appendix A Acronyms and Abbreviations

ASDC	Atmospheric Science Data Center
CERES	Clouds and the Earth's Radiant Energy System
CM	Configuration Management
CRS	Clouds and Radiative Swath
DAAC	Distributed Active Archive Center
DB	Data Base
EOD	End of Data Month
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
FSW	Monthly Single Satellite Fluxes and Clouds
GMT	Greenwich mean time
HDF	Hierarchical Data Format
LaTIS	Langley TRMM Information System
MB	Megabytes
met	metadata file
µm	microns
MOA	Meteorological, Ozone, and Aerosol
N/A	Not Applicable
NASA	National Aeronautics and Space Administration
NOAA	National Oceanic and Atmospheric Administration
PCF	Process Control File
PGE	Product Generation Executive
PMOA	Post Meteorological, Ozone, and Aerosol
QC	Quality Control
SFC	Monthly Gridded Single Satellite TOA and Surface Fluxes and Clouds
SMF	Status Message File
SSAI	Science Systems and Applications, Inc.
SSF	Single Satellite CERES Footprint TOA and Surface Fluxes, Clouds
TISA	Time Interpolation and Spatial Averaging
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission
VD	Validation Days

## Appendix B Error Messages

Appendix B contains a comprehensive list of messages that can be generated during the execution of a PGE. These messages are used to inform the operator or analyst of specific circumstances encountered during data processing. 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). All messages are written to the LogReport file and/or the LogStatus file of the processing instance.

[Table B-1](#) contains a list of the diagnostic messages for the following PGEs: CER9.0P1, CER9.0P2, CER9.0P3, CER9.1P1, CER9.1P2, CER9.2P2, CER9.3P2, CER9.4P2, CER9.2P3, CER9.3P3, and CER9.4P3. Each table entry includes a message, a description for the message, and an action key.

### Operator Instructions:

If a PGE prematurely terminates, then take the following steps:

1. Look at the last few records on the LogStatus file.
2. Find the error message in the following Error Message listing(s), and follow the appropriate ACTION
3. If an error message is not in the LogStatus file, then repeat steps 1 and 2 using the LogReport File.
4. If no information is derived, then call the responsible person in [Table 1-1](#).
5. If the appropriate ACTION failed, then call the responsible person in [Table 1-1](#).
6. In all cases, log all steps that were taken after the PGE failure, and send a copy to the responsible person listed in [Table 1-1](#).

Action Keys for [Table B-1](#): (Note if an ACTION does not work, call the responsible person for the PGE.)

1. Verify that file exists and that it has the correct file permissions set.
2. Check the PCF ASCII input file and the PCF file for correctness.
3. Allocate more memory, rerun.
4. No Action, call the responsible person for the PGE.
5. No Action, message is for informational purposes only and will not affect data production

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
<p>Subroutine Name(): ERROR.....CRS file header and header expected by PCF differ.</p> <p>The header on the file listed in the PCF for logic ID# 1050 does not match what is expected for the header.</p>	2,4
<p>Subroutine Name(): ERROR.....CRS_File module has not been initialized.</p> <p>The file listed in the PCF for logic ID# 1050 was not opened.</p>	1,2,4
<p>Subroutine Name(): ERROR.....Directional model on file has %i number of scene types, and the code allows for %i number of scene types.</p> <p>If number is correct on file listed in the PCF for logic ID# 201, then the code needs to be modified to account for the different number of scene types. If the number is not correct on the file, ensure that the file is not corrupted.</p>	1,2,4
<p>Subroutine Name(): ERROR.....Gridding PCF unanticipated exception for logic ID %i.</p> <p>An unanticipated error occurred while attempting to retrieve information associated with the given logic ID from the PCF.</p>	2,4
<p>Subroutine Name(): ERROR.....Invalid Data Month, (Hour, PCF, Header):</p> <p>The Data Month on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the Data Month provide in the PCF for logic ID# 6903.</p>	2,4
<p>Subroutine Name(): ERROR.....Invalid Data Year, (Hour, PCF, Header):</p> <p>The Data Year on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the Data Year provide in the PCF for logic ID# 6902.</p>	2,4
<p>Subroutine Name(): ERROR.....Invalid Hour Number, (Hour, Header):</p> <p>The Data Hour on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the Data Hour provide in the PCF for logic ID# 6906.</p>	2,4
<p>Subroutine Name(): ERROR.....Invalid Instrument, (Hour, PCF, Header):</p> <p>The CERES instrument name on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the CERES instrument name provide in the PCF for logic ID# 6907.</p>	2,4
<p>Subroutine Name(): ERROR.....Invalid Satellite, (Hour, PCF, Header):</p> <p>The CERES satellite name on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the CERES satellite name provide in the PCF for logic ID# 6908.</p>	2,4
<p>Subroutine Name(): ERROR.....No FSW hour files to process.</p> <p>At least one of the FSW hourly files listed in the PCF for logic ID# 6100 must exist in order for the PGE to run.</p>	1,2,4

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
Subroutine Name(): ERROR.....No MOA files could be opened for processing. At least one of the MOA files listed in the PCF for logic ID# 1120 must exist in order for the PGE to run. <i>NOTE: All MOA files for the data month being processed are expected, but this PGE can run with only one MOA file present. All PMOA records for which no MOA data is available will be filled with CERES default values.</i>	<b>1,2,4</b>
Subroutine Name(): ERROR.....No SFC hour files to process. At least one of the SFC hourly files listed in the PCF for logic ID# 9200 must exist in order for the PGE to run.	<b>1,2,4</b>
Subroutine Name(): ERROR.....OUT OF MEMORY - unable to allocate memory for array %s. The PGE was unable to allocate memory for the given array.	<b>3,4</b>
Subroutine Name(): ERROR.....SSF file header and header expected by PCF differ. The header on the file listed in the PCF for logic ID# 1046 does not match what is expected for the header.	<b>2,4</b>
Subroutine Name(): ERROR.....SSF_File module has not been initialized. The first file listed in the PCF for logic ID# 1046 was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to create new hourbox for region %i and local hour %i. The PGE was unable to create a new hourbox. The region or hour number associated with the hour box was invalid.	<b>4</b>
Subroutine Name(): ERROR.....Unable to open CRS file The file listed in the PCF for logic ID# 1050 was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open FSW ancillary range file - Logic Id: The file associated with the given Logic ID was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open FSW Day File for day: The file listed in the PCF for logic ID# 6210 for the given day was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open FSW Hour File for hour: The file listed in the PCF for logic ID# 6100 for the given hour was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open FSW range results file The file listed in the PCF for logic ID# 6120 was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open FSW Zone File for zone: The file listed in the PCF for logic ID# 6200 for the given zone was not opened.	<b>1,2,4</b>
Subroutine Name(): ERROR.....Unable to open next hour SSF file The file listed in the PCF for logic ID# 1046 version ID# 1 was not opened.	<b>1,2,4</b>

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
Subroutine Name(): ERROR.....Unable to open PMOA file(s). A file listed in the PCF for logic ID# 9100 was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SFC ancillary range file - Logic Id: The file associated with the given Logic ID was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SFC Day File for day: The file listed in the PCF for logic ID# 9310 for the given day was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SFC Hour File for hour: The file listed in the PCF for logic ID# 9200 for the given hour was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SFC range results file The file listed in the PCF for logic ID# 9220 was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SFC Zone File for zone: The file listed in the PCF for logic ID# 9300 for the given zone was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to open SSF file The file listed in the PCF for logic ID# 1046 version ID# 2 was not opened.	1,2,4
Subroutine Name(): ERROR.....Unable to read FSW Day File for day: The file listed in the PCF for logic ID# 6210 for the given day could not be read.	1,4
Subroutine Name(): ERROR.....Unable to read SFC Day File for day: The file listed in the PCF for logic ID# 9310 for the given day could not be read.	1,4
Subroutine Name(): ERROR.....Unable to read CRS record (bad read). The file listed in the PCF for logic ID# 1050 could not be read.	1,4
Subroutine Name(): ERROR.....Unable to read FSW range file The was an error reading one of the files listed in the PCF for logic ID#s 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, or 623.	1,4
Subroutine Name(): ERROR.....Unable to read SFC range file. The was an error reading one of the files listed in the PCF for logic ID#s 911, 912, 913, 914, 915, 916.	1,4
Subroutine Name(): ERROR.....Unable to read SSF record (bad read). The file listed in the PCF for logic ID# 1046 could not be read.	1,4
Subroutine Name(): ERROR.....Unable to retrieve MOA file name from PCF (logic_id = %i, version = %i) The file name for the MOA file listed in the PCF for the given logic ID and version ID could not be retrieved.	2,4

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
Subroutine Name(): ERROR.....Unable to write header to FSW Zone file for zone: The header for the file listed in the PCF for logic ID# 6200 for the given zone could not be written.	1,4
Subroutine Name(): ERROR.....Unable to write header to SFC Zone file for zone: The header for the file listed in the PCF for logic ID# 9300 for the given zone could not be written.	1,4
Subroutine Name(): ERROR.....Unable to write to FSW Day File for day: An error occurred while attempting to write to the file listed in the PCF for logic ID#6210 for the given day.	1,4
Subroutine Name(): ERROR.....Unable to write to FSW Zonal File for zone: An error occurred while attempting to write to the file listed in the PCF for logic ID#6200 for the given zone.	1,4
Subroutine Name(): ERROR.....Unable to write to SFC Day File for day: An error occurred while attempting to write to the file listed in the PCF for logic ID#9310 for the given day.	1,4
Subroutine Name(): ERROR.....Unable to write to SFC Zonal File for zone: An error occurred while attempting to write to the file listed in the PCF for logic ID#9300 for the given zone.	1,4
Subroutine Name(): ERROR.....Writing PMOA record An error occurred while attempting to write to the file listed in the PCF for logic ID#9100.	1,4
Subroutine Name(): FATAL.....solar_dec program : %i The solar declination angles and the distance corrected solar constants could not be retrieved from the solar declination module in CERESLib.	4
Subroutine Name(): FATAL.....Unable to open CDM file : %i The file listed in the PCF for logic ID# 210 could not be opened.	1,2,4
Subroutine Name(): MESSAGE....Invalid number of footprints retrieved from gridding_pcf. Using default of %i. The number of footprints to read could not be retrieved from the PCF for logic ID# 6910. Using the given default number of footprints.	5
Subroutine Name(): SUCCESS....CRS file header and header expected by PCF match. The header on the file listed in the PCF for logic ID# 1050 matches what is expected for the header.	5
Subroutine Name(): SUCCESS....CRS file opened successfully. The file listed in the PCF for logic ID# 1050 was opened successfully.	5
Subroutine Name(): SUCCESS....SSF file header and header expected by PCF match. The header on the file listed in the PCF for logic ID# 1046 matches what is expected for the header.	5

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
Subroutine Name(): SUCCESS....SSF file opened successfully. The file listed in the PCF for logic ID# 1046 was opened successfully.	5
Subroutine Name(): WARNING....Column is out of bounds for footprint: The width (number of columns) of the swath has been miscalculated.	4
Subroutine Name(): WARNING....Date/Time Difference: The Data Date on the header of the file listed in the PCF for logic ID#1046 or logic ID#1050 does not match the Data Date provide in the PCF for logic ID#s 6902, 6903, 6904, and 6906.	4
Subroutine Name(): WARNING....FSW Hour File does not exist: %s The given file listed in the PCF for logic ID# 6100 does not exist	4
Subroutine Name(): WARNING....FSW range array has not been initialized The array that holds the ranges for each FSW parameter has not be properly initialized. One of the files listed in the PCF for logic ID#s 611, 612, 613, 614, 615, 616, 617, 618, 619, 620, 621, 622, or 623 may not have been opened or read properly, or the FSW range check module was not properly initialized.	4
Subroutine Name(): WARNING....Hourbox passed has not been initialized. The hourbox has not been properly initialized.	4
Subroutine Name(): WARNING....Invalid beginning nested region sequence number. Begin nested region sequence # = %i. Using default of 1. An invalid nested region sequence number was provided in the PCF for logic ID# 6917.	4
Subroutine Name(): WARNING....Invalid ending nested region sequence number. End nested region sequence # = %i. Using default of 44012. An invalid nested region sequence number was provided in the PCF for logic ID# 6918.	4
Subroutine Name(): WARNING....Invalid footprint passed. An invalid footprint has been detected.	4
Subroutine Name(): WARNING....Invalid hourbox passed. An invalid hourbox has been detected.	4
Subroutine Name(): WARNING....Invalid nested region range. Begin nested region sequence # = %i, End nested region sequence # = %i. Using default range of 1 to 44012. The nested region sequence number provided in the PCF for logic ID# 6917 must be smaller than the nested region sequence number provided in the PCF for logic ID# 6918.	4
Subroutine Name(): WARNING....Invalid region number passed: An invalid region number has been detected.	4

Table B-1. Example of TK (SMF) Utility Message Table

Message / Description	Action Key
<p>Subroutine Name(): WARNING....Missing input for hour %i of day %i.            The given MOA file listed in the PCF for logic ID# 1120 does not exist or could not be opened.  <i>NOTE: All MOA files for the data month being processed are expected, but this PGE can run with only one MOA file present. All PMOA records for which no MOA data is available will be filled with CERES default values.</i></p>	4
<p>Subroutine Name(): WARNING....MOA file does not exist: %s            The given MOA file listed in the PCF for logic ID# 1120 does not exist.  <i>NOTE: All MOA files for the data month being processed are expected, but this PGE can run with only one MOA file present. All PMOA records for which no MOA data is available will be filled with CERES default values.</i></p>	1,2,4
<p>Subroutine Name(): WARNING....PMOA_File module has not been initialized.            The routine which opens the files listed in the PCF for logic ID# 9100 was not properly initialized. The PGE will continue to run, but the column-weighted cloud parameters are invalid.</p>	1,2,4
<p>Subroutine Name(): WARNING....SFC Hour File does not exist:            The given file listed in the PCF for logic ID# 9200 does not exist</p>	5
<p>Subroutine Name(): WARNING....SFC range array has not been initialized            The array that holds the ranges for each SFC parameter has not be properly initialized. One of the files listed in the PCF for logic ID#s 911, 912, 913, 914, 915, 916 may not have been opened or read properly, or the SFC range check module was not properly initialized.</p>	1,2,4
<p>Subroutine Name(): WARNING....Unable to open FSW Day File for day:            The file listed in the PCF for logic ID# 6210 for the given day was not opened.</p>	5
<p>Subroutine Name(): WARNING....Unable to open MOA file:            The given MOA file listed in the PCF for logic ID#1120 could not be opened.  <i>NOTE: All MOA files for the data month being processed are expected, but this PGE can run with only one MOA file present. All PMOA records for which no MOA data is available will be filled with CERES default values.</i></p>	1,2,4
<p>Subroutine Name(): WARNING....Unable to open PMOA file            One of the PMOA file listed in the PCF for logic ID#9100 could not be opened.  <i>NOTE: All PMOA files for the data month being processed are expected, but this PGE can run without the PMOA files. CERES default values will be used for all PMOA parameters.</i></p>	1,2,4
<p>Subroutine Name(): WARNING....Unable to open SFC Day File for day:            The file listed in the PCF for logic ID# 9310 for the given day was not opened.</p>	5
<p>Subroutine Name(): WARNING....Unable to read PMOA record (bad read).            The file listed in the PCF for logic ID# 9100 could not be read.</p>	1,2,4