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

Data Management System

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget, Subsystems 4.5 and 4.6 Operator's Manual

Release 5
Version 16

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SW Delivered to CM: December 2015
Document Date: December 2015

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
05/10/01	R3V4	259	• Added new PGE CER4.5-6.3P1. • Updated format to comply with standards.	Sec. 3.0 All
09/24/01	R3V5	297	• Added the binary QC file as input to and output from PGE CER4.5-6.3P1. • Updated format to comply with standards.	Sec. 3.3 All
03/21/02	R3V6	322	• Added new PGE CER4.5-6.1P2. • Added new PGE CER4.5-6.2P2. • Corrected file disposition for SSFAS-NIT files. • Updated format to comply with standards.	Sec. 2.0 Sec. 4.0 Sec. 4.0 All
04/26/02	R3V7	346	• Updated Error Messages. • Updated Sample ASCII files. • SSFB-nadir and SSF-nadir products produced by PGE CER4.5-6.2P2. • Updated format to comply with standards.	App. B App. C Sec. 4.0 All
06/21/02	R4V1	367	• Added new PGE CER4.5-6.1P3 for processing Aqua data. • Updated CER4.5-6.1P2 to use dynamic SSC produced by PGE CER2.4P1. • Updated format to comply with standards.	Sec. 3.0 Sec. 2.0 All
08/20/02	R4V2	381	• Updated CER4.5-6.2P2 to produce binary SSF/SSFA validation product. • Updated format to comply with standards.	Sys. Overview & 5.6 All
09/19/02	R4V3	393	• Added Production Strategy PS4_7 to PGEs CER4.5-6.1P2 and CER4.5-6.1P3. For normal operations, $PS4_7 = "Null." When Default Spectral Correction Coefficients are to be used, $PS4_7 = "DefaultSCC." • Updated format to comply with standards.	Secs. 2.2.2, 2.3.5, 2.3.6, 3.2.2, 3.3.5, 3.3.6, & B.1 All

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10/10/02	R4V4	399	• Corrected Input CCode for PGE CER4.5-6.2P2 from $CC4_8 to $CC4_5. • Updated format to comply with standards.	Secs. 5.2.2, 5.3.1, & 5.3.2 All
01/27/03	R4V5	416	• Changed Parent PGE name to CER4.1-1.1P3. • Updated format to comply with standards.	Secs. 3.3.3 & 3.3 All
08/27/03	R4V6	461	• Added new PGE CER4.5-6.3P2. • Added new PGE CER4.5-6.4P1 for production of monthly validation product. • Updated format to comply with standards.	Sys. Overview, Sec. 7.0, App. B, & C Sys. Overview, Sec. 8.0, App. B, & C All
12/08/03	R4V7	488	• Added new PGE CER4.5-6.3P3. • Updated format to comply with standards.	Sec. 8.0, App B, & C.8 All
06/30/04	R4V8	543	• Output validation files no longer removed in CER4.5-6.2P2. Files required as input to CER4.5-6.4P1. • Corrected input data file name for CER4.5-6.4P1. • Updated format to comply with standards.	Sec. 5.6 Sec. 9.3.2 All
08/02/04	R4V9	547	• Changed output Configuration Code for CER4.5-6.1P2 and CER4.5-6.1P3 from CC4_8 to CC4_5. • Added 'Archive' destination for CER_GQCI* files created by PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.3P2, and CER4.5-6.3P3. • Updated format to comply with standards.	Sec. 1.2, 2.2, 2.4, 2.5, 2.6, 2.7, 3.2, 3.4, 3.5, 3.6, & 3.7 Secs. 2.6, 3.6, 7.6, & 8.6 All
11/24/04	R4V10	568	• Added new PGE CER4.5-6.6P2. • Modified Alternate contact for all PGEs. • Added spectral correction coefficient file descriptions to input.	Sys. Overview, Sec. 10.0, App. B, & C Secs. 1.1, 2.1, 3.1, 4.1, 5.1, 6.1, 7.1, 8.1, & 9.1 Secs. 8.3.5 & 8.3.6

Document Revision Record

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11/24/04 (Cont.)	R4V10	568	• Updated format to comply with standards.	All
12/08/04	R4V11	572	• Added new PGE CER4.5-6.6P3. • Changed file frequency designation for CER4.5-6.6P2. • Updated format to comply with standards.	Sys. Overview, Sec. 11.0, App. B, & C Sec. 10.6 All
3/07/05	R4V12	578	• Added Environment variables, SS2, PS2.4, and CC2.4. • Added input files (SCCD, SCCN) for spectral correction. • Updated format to comply with standards.	Sec. 10.2 Sec. 10.3 All
4/04/05	R4V13	581	• Added additional parent PGE info for PGEs CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.6P2, and CER4.5-6.6P3. • Added alternate source PGEs and corrected input numbering for CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.6P2, and CER4.5-6.6P3. • Corrected file names for CER4.5-6.6P2 PCF generator and PCF and PCFin output files. • Added input files (SCCD, SCCN) for spectral correction for CER4.5-6.3P2. • Updated format to comply with standards.	Secs. 7.1.3, 8.1.3, 10.1.3, & 11.1.3 Secs. 7.3, 8.3, 10.3, & 11.3 Sec. 10.4.1 Sec. 7.3 All
5/11/05	R4V14	587	• Corrected PGE descriptions. • Added additional input and output to PGE CER4.5-6.2P2. • Changed File Disposition for dynamic ancillary files. • Changed File Disposition for input files.	Overview Sec. 5.1-6 Secs. 2.3.5-6, 3.3.5-6, 7.3.5-6, 8.3.5-6, 10.3.5-6, & 11.3.5-6 Secs. 6.3.1, 7.3.1, 8.3.1, 9.3.1-2, 10.3.1, & 11.3.1

Document Revision Record

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5/11/05 (Cont.)	R4V14	587	• Remove disabled PGE CER5.2P1 as a target PGE from all Inversion PGEs.	Secs. 1.1.4, 1.6, 2.1.4, 2.6, 3.1.4, 3.6, 6.1.4, 6.6, 7.1.4, 7.6, 8.1.4, 8.6, 10.1.4, 10.6, 11.1.4, & 11.6
			• Added Parent PGE.	Secs. 7.1.3 & 8.1.3
			• Modified environment script requirements.	Secs. 7.2.2 & 8.2.2
			• Added additional error messages for PGE CER4.5-6.2P2.	App. B
			• Updated PCFin entry for PGE CER4.5-6.2P2.	App. C
			• Updated format to comply with standards.	All
10/10/05	R4V15	596	• Added CC4_8 line and a note.	Secs. 2.2.2 & 3.2.2
			• Updated PCFin entry for PGE CER4.5-6.1P3, CER4.5-6.3P3, and CER4.5-6.6P3.	App. C
			• Updated format to comply with standards.	All
05/02/06	R4V16	625	• Expected output files SSFB-nadir and SSF-nadir were changed from mandatory to optional.	Table 5-6
			• Updated format to comply with standards.	All
03/21/08	R5V1	N/A	• This was an Excel version that ultimately wasn't used.	All

Document Revision Record

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12/08/08	R5V2	690	• Updated directory structure for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.2P2, CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.4P1, CER4.5-6.6P2, and CER4.5-6.6P3. • Updated Responsible Persons for all PGEs. • Updated estimated runtime, memory and disk usage for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.2P2, CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.4P1, CER4.5-6.6P2, and CER4.5-6.6P3.	Secs. 1.1.1, 2.1.1, 2.2.4, 2.4.1, 2.4.2, 2.5.3, 3.1.1, 3.2.4, 3.4.1, 3.4.2, 3.5.3, 4.1.1, 5.1.1, 5.2.4, 5.4.1, 5.4.2, 5.5.3, 6.1.1, 7.1.1, 7.2.4, 7.4.1, 7.4.2, 7.5.3, 8.1.1, 8.2.4, 8.4.1, 8.4.2, 8.5.3, 9.1.1, 9.2.4, 9.4.1, 9.4.2, 9.5.3, 10.1.1, 10.2.4, 10.4.1, 10.4.2, 10.5.3, 11.1.1, 11.2.4, 11.4.1, 11.4.2, 11.5.3, App C: C.2, C.3, C.5, C.7, C.8, C.9, C.10, & C.11
03/04/09	R5V3	704	• Added new PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3, and CER4.5-6.4P2 and renumbered subsequent PGEs. • Updated Environment Variables for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.6P2, and CER4.5-6.6P3. • Added Mandatory/Optional file information for Environment Variable PS4_7 to PGEs CER4.5-6.3P2, CER4.5-6.3P3, and CER4.5-6.6P2. • Updated directories in the Expected Output table for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.2P2, CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.4P1, CER4.5-6.6P2, and CER4.5-6.6P3.	Subsystem Overview, Secs. 4.0-7, 5.0-7, 8.0-7, & 13.0-7 Secs. 2.1.3, 2.2.2, 2.3.1-3, 2.4.1-2, 2.5.3, 2.7, 3.2.2, 3.3.1-3, 3.4.1-2, 3.5.3, 3.7, 10.2.2, 11.2.2, 14.2.2, & 15.2.2 Secs. 10.3.5-6, 11.3.5-6, & 14.3.5-6 Secs. 2.6, 3.6, 7.6, 10.6, 11.6, 12.6, 14.6, & 15.6

Document Revision Record

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03/04/09 (Cont.)	R5V3	704	• Corrected SCOOL filename and file location. • Changed "PCF" to "pcf" in filenames. (03/30/09) • A footnote was added to Expected Output File Listing tables. (06/10/09) • Removed Appendix C - Sample ASCII (PCFin) File Listing since PCFin files are no longer required. (09/16/2009) • Removed PCFin references in PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3 and CER4.5-6.4P2. (11/02/2009)	Secs. 7.3.3 & 8.3.3 Secs. 2.4.1, 3.4.1, 4.4.1, 5.4.1, 7.4.1, 8.4.1, 10.4.1, 11.4.1, 12.4.1, 13.4.1, 14.4.1, 15.4.1, Tables 2-6, 3-6, 4-6, 5-6, 7-6, 8-6, 10-6, 11-6, 12-5, 13-5, 14-5, & 15-6 Tables 7-6 & 8-6. App. C Sec. 4.4.1, Table 4-6, Sec. 5.4.1, Table 5-6, Sec. 8.4.1, Table 8-6, Sec. 13.4.1, & Table 13-5
9/4/09	R5V4	722	• Added new PGEs CER4.5-6.5P2 and CER4.5-6.5P3. • Added "Archive" to CER_GQCA Expected Output File. (01/06/10)	Secs. 14, 15, Document & Subsystem Overview, App. A, & B Table 4-6
05/28/10	R5V5	786	• Added new PGEs CER4.5-6.5P4 and CER4.5-6.5P5. • Changed descriptions of CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3, CER4.5-6.4P2, CER4.5-6.5P2, and CER4.5-6.5P3 from Edition3 to Edition4. • Removed /QA from expected output file listings destination column. • The word "meta" was added in red to the PGE CER4.5-6.5P4 SSF file in the output file listing destination column. (06/29/2010)	Secs. 16, 17, Document & Subsystem Overview, & App. B Secs. 4.0, 5.0, 8.0, 8.1.3, 8.1.4, 13.0, 14.0, & 15.0 Tables 1-6, 2-6, & 3-6 Table 16-6

Document Revision Record

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06/22/10	R5V6	791	• Added PGE CER4.5-6.2P4. • Added "Available Through Ordering Tool" column and removed red "meta" from expected output tables. (09/15/2010) • "Yes" was added to the SSF output file in the "Available Through Ordering Tool" column. (09/23/2010)	Secs. 9.0, 17.1.4, 18.1.4, Tables 17-6, 18-6, Document & Subsystem Overview, App. B, & Table B-2 All Expected Output Tables Table 15-6
01/26/11	R5V7	828 & 829	• Added note that PS2_4 and CC2_4 do not need to be set when PS4_7 is set to "DefaultSCC" for PGEs CER4.5-6.1P2 and CER4.5-6.1P3.	Secs. 2.2.2 & 3.2.2
11/04/10	R5V8	814	• Updated Alternate Contacts. Updated Runtime Parameters and Processor Dependencies for PGEs CER4.5-6.1P4 and CER4.5-6.1P5. Updated Operating Procedures for PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3, and CER4.5-6.4P2. • Deleted QC.tar file in output file table. • Deleted the PCF.tar files in the expected output tables. • Disabled the following PGEs in the operator's manual: CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.6P2, and CER4.5-6.6P3. • Modified a link and document title name. (04/10/2012) • Added environment variables and directories to tables in PGEs CER4.5-6.1P4 and CER4.5-6.1P5. (06/21/2012) • Added daily MATCH as input file for PGEs CER4.5-6.1P4 and CER4.5-6.1P5. (06/21/2012) • Added "Archive" in "Destination" column for the PCF file in PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2.P3, and CER4.5-6.4P2. (06/25/2012) • Modified directory file names for input files for *AMI-P6*. (06/28/2012) • Modified directory file names for output files for *AMI-P6*. (06/28/2012)	Secs. 1-20.1.1, 4.2, 4.3, 4.4, 5.2, 5.3, 5.4, 8.4, 14.4, Tables 4-5, 5-5, 8-5, & 14-5 Tables 4-6 & 5-6 Tables 4-6, 5-6, 8-6, & 14-6. Secs. 11, 12, 19, & 20 References Tables 4-4, 4-6, 5-4, & 5-6 Secs. 4.3.11 & 5.3.11 Tables 4-6, 5-6, 8-6, & 14-5. Secs. 8.3.1, 8.3.2, 14.3.1, & 14.3.2 Tables 8-6 & 14-5

Document Revision Record

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11/04/10 (Cont'd)	R5V8	814	• Added "Archive" to "Destination" column of output tables (07/03/2012) • Changed SS4_5 to SS4_6 for input files SSFB, SSFA, and GQCI in PGEs CER4.5-6.1P4 and CER4.5-6.1P5. (08/21/2012)	Tables 4-6, 5-6, 8-6, & 14-5 Secs. 4.3.4, 4.3.5, 4.3.6, 5.3.4, 5.3.5, & 5.3.6
7/25/2012	R5V9	912	• Added PCF log files to the expected output sections of PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3, CER4.5-6.2P4, CER4.5-6.4P1, CER4.5-6.4P2, CER4.5-6.5P4, and CER4.5-6.5P5. • Updated input directories, output directories, file dispositions, exit codes, and changed c-shell scripts to perl scripts for PGEs CER4.5-6.1P4, CER4.5-6.1P5, 4.5-6.2P3, CER4.5-6.2P4, CER4.5-6.4P1, CER4.5-6.5P4, and CER4.5-6.5P5. • Changed Environment Variables for PGEs CER4.5-6.5P4 and CER4.5-6.5P5.	Tables 4-6, 5-6, 8-6, 9-6, 13-5, 14-5, 17-6, & 18-6 Secs. 4.3.4-10, 5.3.4-10, 8.3.1-2, 9.3.1-2, 9.4, 9.4.1-2, 9.4.4, 9.5.1-2, 9.5.4, 13.3.1-2, 13.4, 13.4.1-2, 13.4.4, 13.5.1-2, 13.5.4, 17.3.1-7, 17.4, 17.4.1-2, 17.4.4, 17.5.1-2, 17.5.4, 18.3.1-7, 18.4, 18.4.1-2, 18.4.4, 18.5.1-2, 18.5.4, Tables 9-6, 13-5, 17-6, & 18-6 Secs. 17.2.2 & 18.2.2
7/25/2012	R5V10	913	• Updated file dispositions for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.2P2, CER4.5-6.2P4, CER4.5-6.4P1, CER4.5-6.5P4, and CER4.5-6.5P5. • Updated input directories, output directories, exit codes, file dispositions, and changed c-shell scripts to perl scripts for PGEs CER4.5-6.1P2, CER4.5-6.1P3, and CER4.5-6.2P2. • Updated Environment Variables for PGEs CER4.5-6.1P2 and CER4.5-6.1P3.	Tables 2-6, 3-6, 7-6, 9-6, 13-5, 17-6, & 18-6 Secs. 2.3.1-6, 2.4, 2.4.1, 2.4.2, 2.4.4, 2.5.2-4, 2.7, 3.3.1-6, 3.4, 3.4.1, 3.4.2, 3.4.4, 3.5.2-4, 3.7, 7.0, 7.3.1, 7.3.2, 7.4, 7.4.1, 7.4.2, 7.4.4, 7.5.2 & 7.5.4, Tables 2-5, 2-6, 3-5, 3-6, 7-5, & 7-6 Secs. 2.2.2 & 3.2.2

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7/25/2012 (Cont'd)	R5V10	913	• Updated GQCA file disposition and added PCF .log files for PGEs CER4.5-6.1P2 and CER4.5-6.1P3. (12/17/2012) • PGEName CER1.1P3 was changed to read CER1.4P3. (04/09/2013).	Tables 2-6 & 3-6 Table 17-2
3/21/2013	R5V11	959	• Removed deleted PGEs CER4.5-6.1P1, CER4.5-6.2P1, CER4.5-6.3P1, CER4.5-6.3P2, CER4.5-6.3P3, CER4.5-6.5P2, CER4.5-6.5P3, CER4.5-6.6P2, and CER4.5-6.6P3. • Added PGE CER4.5-6.1P7. • Updated environment variables for PGEs CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.2P3, and CER4.5-6.4P2. • Updated file dispositions for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5. (09/03/2013) • Updated input file directory locations for PGEs CER4.5-6.5P4 and CER4.5-6.5P5. (09/03/2013) • Changed "Available Through Ordering Tool" column for SSF output file to read from "No" to "Yes." (10/03/2013) • Modified PCF and PCF.log filenames. (10/03/2013) • Modified PCF and PCF.log files to conform with making them two files (a PCF and PCF.log) instead of one (PCF(.log)) to follow how it is normally done in the operator's manuals. (10/03/2013) • Fixed some cross reference link issues. (10/11/2013)	Document Overview, Secs. 1.0, 6.0, 10.0, 11.0, 12.0, 15.0, 16.0, 19.0, 20.0, & App. B Sec. 5.0 Secs. 3.2.2, 4.2.2, 7.2.2, & 10.2.2 Secs. 1.3.4-1.3.6, 2.3.4-2.3.6, 3.3.4-3.3.10, 4.3.4-4.3.10, 5.3.4-5.3.10, 11.3.1-11.3.7, & 12.3.1-12.3.7 Secs. 11.3.1, 11.3.2, 11.3.4, 12.3.1, 12.3.2, & 12.3.4 Tables 1-6 & 2-6 Table 5-6 Table 12-6 All
7/29/2013	R5V12	973	• Replaced PGEs CER4.5-6.1P4 and CER4.5-6.1P5 with PGE CER4.5-6.1P6 for Terra and Aqua Edition4. • Modified Appendix B to correspond with replaced PGEs.	Document Overview, Secs. 3 & 4 App. B

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2/19/2014	R5V13	1001	• Added PGE CER4.5-6.0P6 Sea Ice Brightness Index pre-processor. • Added NPP to PGE CER4.5-6.0P6. (03/26/2014) • Modified environment script parameters. (03/26/2014) • Added PGE CER4.5-1.1P7 and description. (03/26/2014) • Modified sibiMap and PCF filenames. (03/26/2014)	Document Overview, Subsystem Overview, Sec. 1, & App. B Sec.1.0 Sec. 2.2.2 Table 1-3 Table 1-6
4/16/2014	R5V14	1009	• Removed SCOOL output files from PGEs CER4.5-6.2P2, CER4.5-6.2P3, and CER4.5-6.2P4. • Added NPP to PGEs CER4.5-6.2P3 and CER4.5-6.4P2.	Secs. 6.3.3, 6.6, 7.3.3, 7.6, 8.3.3, 8.6, & Table B-2 Secs. 7.0, 10.0, & Table 7-3.
3/21/2013	R5V15	959	• Added PGE CER4.5-6.1P7. • Updated PGE CER4.5-6.1P7 parent PGE, environment variables, SibiMap data, and MATCH data. • Added MATCH-daily and SORCE TSI input data to PGEs CER4.5-6.1P6 and CER4.5-6.1P7. • Added DPO to the necessary output products. (06/04/2014). • Corrected sibiMap output to show only YYYYMM. (06/30/2014) • Changed SSFI input for CER4.5-6.0P6 to N/A from Remove. (07/01/2014) • Removed .met file from output for PGE CER4.5-6.0P6. (07/03/2014)	Subsystem Overview Secs. 5.2.2, 5.3.11, 5.3.12, & Tables 5-2 & 5-4 Secs. 4.3.11, 4.3.13, 5.3.11, & 5.3.13 Tables 1-6, 2-6, 3-6, 4-6, 5-6, 6-6, 7-6, 8-6, 9-6, 10-6, 11-6, & 12-6 Table 1-6 Sec. 1.3.1 Table 1-6
12/02/2015	R5V16	1100	• Added target PGE and 'rm' to destination for the sibiMap output file. • Added sge_logs output file. • Updated source and target PGEs for PGE CER4.5-6.1P2. • Updated source and target PGEs for PGE CER4.5-6.1P3.	Table 1-6 Tables 1-6, 4-6, & 5-6 Secs. 2.3.1, 2.3.2, 2.3.3, & Tables 2-2, 2-3, & 2-6 Secs. 3.3.1, 3.3.2, 3.3.3, & Tables 3-2, 3-3, & 3-6

Document Revision Record

SCCR Approval Date	Release/ Version Number	SCCR Number	Description of Revision	Section(s) Affected
12/02/2015 (Cont'd)	R5V16	1100	• Updated source and target PGEs for PGE CER4.5-6.1P6. • Updated source and target PGEs for PGE CER4.5-6.1P7. • Updated source PGEs for PGE CER4.5-6.2P2. • Updated source PGEs for PGE CER4.5-6.2P3. • Updated source and target PGEs for PGE CER4.5-6.5P4. • Updated source and target PGEs for PGE CER4.5-6.5P5.	Secs. 4.1.4, 4.3.7, & Tables 4-2, 4-3, & 4-6 Secs. 5.1.4, 5.3.7, & Tables 5-2, 5-3, & 5-6 Secs. 6.3.1, 6.3.2, & Table 6-2 Secs. 7.3.1, 7.3.2, & Table 7-2 Secs. 11.3.1, 11.3.2, 11.3.4, 11.3.7, & Tables 11-2, 11-3, & 11-6 Secs. 12.3.1, 12.3.2, 12.3.4, 12.3.7, & Tables 12-2, 12-3, & 12-6

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 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.

TABLE OF CONTENTS

Section Page

Document Revision Record ii

Preface xiii

Introduction 1

Document Overview 1

Subsystem Overview 2

1.0 PGEName: CER4.5-6.0P6 8

1.1 PGE Details 8

1.1.1 Responsible Persons 8

1.1.2 E-mail Distribution List 8

1.1.3 Parent PGE(s) 8

1.1.4 Target PGE(s) 9

1.2 Operating Environment 9

1.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 9

1.2.2 Environment Script Requirements 9

1.2.3 Execution Frequency (daily, hourly, or monthly) 10

1.2.4 Memory/Disk Space/Time Requirements 10

1.2.5 Restrictions Imposed in Processing Order 10

1.3 Processor Dependencies (Previous PGEs, Ingest Data) 10

1.3.1 Input Dataset Name (#1): SSFI 10

1.3.2 Input Dataset Name (#1): SSFB 11

1.4 Operating Procedures (Procedure for each part of the processor's elements) 11

1.4.1.1 How to Execute PGE CER4.5-6.0P6 using SGE 11

1.4.1.2 Special Case Considerations 12

1.4.1.3 Special Reprocessing Instructions 12

TABLE OF CONTENTS

Section Page

1.5 Execution Evaluation 12
1.5.1 Exit Codes 12
1.5.2 Screen Messages (Use Table format for large number of messages) 12
1.5.3 Log and Status Files Results (Include ALL Log Files) 12
1.5.4 Solutions to Possible Problems 13
1.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 13
1.6 Expected Output Dataset(s) 13
1.7 Expected Temporary Files/Directories 14
2.0 PGEName: CER4.5-6.1P2 15
2.1 PGE Details 15
2.1.1 Responsible Persons 15
2.1.2 E-mail Distribution List 15
2.1.3 Parent PGE(s) 15
2.1.4 Target PGE(s) 16
2.2 Operating Environment 16
2.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 16
2.2.2 Environment Script Requirements 16
2.2.3 Execution Frequency (daily, hourly, or monthly) 17
2.2.4 Memory/Disk Space/Time Requirements 17
2.2.5 Restrictions Imposed in Processing Order 17
2.3 Processor Dependencies (Previous PGEs, Ingest Data) 17
2.3.1 Input Dataset Name (#1): SSFI 17
2.3.2 Input Dataset Name (#2): SSFAI 17

TABLE OF CONTENTS

Section Page

2.3.3 Input Dataset Name (#3): FQCI 18

2.3.4 Input Dataset Name (#4): MOA 18

2.3.5 Input Dataset Name (#5): SCCD 19

2.3.6 Input Dataset Name (#6): SCCN 19

2.4 Operating Procedures (Procedure for each part of the processor's elements) 20

2.4.1 How to Generate the ASCII File and PCF File 20

2.4.2 How to Execute PGE CER4.5-6.1P2 20

2.4.3 Special Case Considerations 20

2.4.4 Special Reprocessing Instructions 21

2.5 Execution Evaluation 21

2.5.1 Exit Codes 21

2.5.2 Screen Messages (Use Table format for large number of messages) 21

2.5.3 Log and Status Files Results (Include ALL Log Files) 21

2.5.4 Solutions to Possible Problems 22

2.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 22

2.6 Expected Output Dataset(s) 22

2.7 Expected Temporary Files/Directories 24

3.0 PGEName: CER4.5-6.1P3 25

3.1 PGE Details 25

3.1.1 Responsible Persons 25

3.1.2 E-mail Distribution List 25

3.1.3 Parent PGE(s) 25

3.1.4 Target PGE(s) 26

TABLE OF CONTENTS

Section Page

3.2 Operating Environment 26
3.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 26
3.2.2 Environment Script Requirements 26
3.2.3 Execution Frequency (daily, hourly, or monthly) 27
3.2.4 Memory/Disk Space/Time Requirements 27
3.2.5 Restrictions Imposed in Processing Order 27
3.3 Processor Dependencies (Previous PGEs, Ingest Data) 27
3.3.1 Input Dataset Name (#1): SSFI 27
3.3.2 Input Dataset Name (#2): SSFAI 27
3.3.3 Input Dataset Name (#3): FQCI 28
3.3.4 Input Dataset Name (#4): MOA 28
3.3.5 Input Dataset Name (#5): SCCD 29
3.3.6 Input Dataset Name (#6): SCCN 29
3.4 Operating Procedures (Procedure for each part of the processor's elements) 30
3.4.1 How to Generate the ASCII File and PCF File 30
3.4.2 How to Execute PGE CER4.5-6.1P3 30
3.4.3 Special Case Considerations 30
3.4.4 Special Reprocessing Instructions 31
3.5 Execution Evaluation 31
3.5.1 Exit Codes 31
3.5.2 Screen Messages (Use Table format for large number of messages) 31
3.5.3 Log and Status Files Results (Include ALL Log Files) 31
3.5.4 Solutions to Possible Problems 32

TABLE OF CONTENTS

Section Page

3.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 32

3.6 Expected Output Dataset(s) 32

3.7 Expected Temporary Files/Directories 34

4.0 PGEName: CER4.5-6.1P6 35

4.1 PGE Details 35

4.1.1 Responsible Persons 35

4.1.2 E-mail Distribution List 35

4.1.3 Parent PGE(s) 35

4.1.4 Target PGE(s) 36

4.2 Operating Environment 36

4.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 36

4.2.2 Environment Script Requirements 36

4.2.3 Execution Frequency (daily, hourly, or monthly) 37

4.2.4 Memory/Disk Space/Time Requirements 38

4.2.5 Restrictions Imposed in Processing Order 38

4.3 Processor Dependencies (Previous PGEs, Ingest Data) 38

4.3.1 Input Dataset Name (#1): SSFI 38

4.3.2 Input Dataset Name (#2): SSFAI 38

4.3.3 Input Dataset Name (#3): FQCI 39

4.3.4 Input Dataset Name (#1): SSFB 39

4.3.5 Input Dataset Name (#2): SSFA 40

4.3.6 Input Dataset Name (#4): GQCI 40

4.3.7 Input Dataset Name (#7): IES 41

TABLE OF CONTENTS

Section Page

4.3.8 Input Dataset Name (#4): MOA 41

4.3.9 Input Dataset Name (#5): SCCD 42

4.3.10 Input Dataset Name (#6): SCCN 42

4.3.11 Input Dataset Name (#7): MATCH 43

4.3.12 Input Dataset Name (#8): sibiMap 43

4.4 Operating Procedures (Procedure for each part of the processor's elements) 44

4.4.1 How to Execute PGE CER4.5-6.1P6 using the Command Line 44

4.4.1.1 How to Generate the ASCII File and PCF File 44

4.4.1.2 How to Execute PGE CER4.5-6.1P6 44

4.4.1.3 How to Execute PGE CER4.5-6.1P6 using SGE 45

4.4.1.4 Special Case Considerations 45

4.4.1.5 Special Reprocessing Instructions 45

4.5 Execution Evaluation 46

4.5.1 Exit Codes 46

4.5.2 Screen Messages (Use Table format for large number of messages) 46

4.5.3 Log and Status Files Results (Include ALL Log Files) 46

4.5.4 Solutions to Possible Problems 46

4.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 47

4.6 Expected Output Dataset(s) 47

4.7 Expected Temporary Files/Directories 48

5.0 PGEName: CER4.5-6.1P7 49

5.1 PGE Details 49

5.1.1 Responsible Persons 49

TABLE OF CONTENTS

Section Page

5.1.2 E-mail Distribution List 49
5.1.3 Parent PGE(s) 49
5.1.4 Target PGE(s) 50
5.2 Operating Environment 50
5.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 50
5.2.2 Environment Script Requirements 50
5.2.3 Execution Frequency (daily, hourly, or monthly) 51
5.2.4 Memory/Disk Space/Time Requirements 52
5.2.5 Restrictions Imposed in Processing Order 52
5.3 Processor Dependencies (Previous PGEs, Ingest Data) 52
5.3.1 Input Dataset Name (#1): SSFI 52
5.3.2 Input Dataset Name (#2): SSFAI 52
5.3.3 Input Dataset Name (#3): FQCI 53
5.3.4 Input Dataset Name (#1): SSFB 53
5.3.5 Input Dataset Name (#2): SSFA 54
5.3.6 Input Dataset Name (#4): GQCI 54
5.3.7 Input Dataset Name (#7): IES 55
5.3.8 Input Dataset Name (#4): MOA 55
5.3.9 Input Dataset Name (#5): SCCD 56
5.3.10 Input Dataset Name (#6): SCCN 56
5.3.11 Input Dataset Name (#7): MATCH 57
5.3.12 Input Dataset Name (#8): sibiMap 57
5.4 Operating Procedures (Procedure for each part of the processor's elements) 58
5.4.1 How to Execute PGE CER4.5-6.1P7 using the Command Line 58

TABLE OF CONTENTS

Section Page

5.4.1.1 How to Generate the ASCII File and PCF File 58

5.4.1.2 How to Execute PGE CER4.5-6.1P7 59

5.4.1.3 How to Execute PGE CER4.5-6.1P7 using SGE 59

5.4.1.4 Special Case Considerations 60

5.4.1.5 Special Reprocessing Instructions 60

5.5 Execution Evaluation 60

5.5.1 Exit Codes 60

5.5.2 Screen Messages (Use Table format for large number of messages) 60

5.5.3 Log and Status Files Results (Include ALL Log Files) 60

5.5.4 Solutions to Possible Problems 61

5.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 61

5.6 Expected Output Dataset(s) 61

5.7 Expected Temporary Files/Directories 62

6.0 PGEName: CER4.5-6.2P2 63

6.1 PGE Details 63

6.1.1 Responsible Persons 63

6.1.2 E-mail Distribution List 63

6.1.3 Parent PGE(s) 63

6.1.4 Target PGE(s) 64

6.2 Operating Environment 64

6.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 64

6.2.2 Environment Script Requirements 64

6.2.3 Execution Frequency (daily, hourly, or monthly) 64

TABLE OF CONTENTS

Section Page

6.2.4 Memory/Disk Space/Time Requirements 64

6.2.5 Restrictions Imposed in Processing Order 64

6.3 Processor Dependencies (Previous PGEs, Ingest Data) 65

6.3.1 Input Dataset Name (#1): SSFB 65

6.3.2 Input Dataset Name (#2): SSFA 65

6.4 Operating Procedures (Procedure for each part of the processor's elements) 66

6.4.1 How to Generate the ASCII File and PCF File 66

6.4.2 How to Execute the Main Processor 66

6.4.3 Special Case Considerations 66

6.4.4 Special Reprocessing Instructions 66

6.5 Execution Evaluation 67

6.5.1 Exit Codes 67

6.5.2 Screen Messages (Use Table format for large number of messages) 67

6.5.3 Log and Status Files Results (Include ALL Log Files) 67

6.5.4 Solutions to Possible Problems 67

6.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 68

6.6 Expected Output Dataset(s) 68

6.7 Expected Temporary Files/Directories 69

7.0 PGEName: CER4.5-6.2P3 70

7.1 PGE Details 70

7.1.1 Responsible Persons 70

7.1.2 E-mail Distribution List 70

7.1.3 Parent PGE(s) 70

TABLE OF CONTENTS

Section Page

7.1.4 Target PGE(s) 71

7.2 Operating Environment 71

7.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 71

7.2.2 Environment Script Requirements 71

7.2.3 Execution Frequency (daily, hourly, or monthly) 72

7.2.4 Memory/Disk Space/Time Requirements 72

7.2.5 Restrictions Imposed in Processing Order 72

7.3 Processor Dependencies (Previous PGEs, Ingest Data) 72

7.3.1 Input Dataset Name (#1): SSFB 72

7.3.2 Input Dataset Name (#2): SSFA 72

7.4 Operating Procedures (Procedure for each part of the processor's elements) 73

7.4.1 How to Execute PGE CER4.5-6.2P3 using the Command Line 73

7.4.1.1 How to Generate the ASCII File and PCF File 73

7.4.1.2 How to Execute the Main Processor 73

7.4.2 How to Execute PGE CER4.5-6.2P3 using SGE 74

7.4.3 Special Case Considerations 74

7.4.4 Special Reprocessing Instructions 74

7.5 Execution Evaluation 75

7.5.1 Exit Codes 75

7.5.2 Screen Messages (Use Table format for large number of messages) 75

7.5.3 Log and Status Files Results (Include ALL Log Files) 75

7.5.4 Solutions to Possible Problems 75

7.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 76

TABLE OF CONTENTS

Section Page

7.6 Expected Output Dataset(s) ... 76
7.7 Expected Temporary Files/Directories ... 77
8.0 PGEName: CER4.5-6.2P4 ... 78
8.1 PGE Details ... 78
8.1.1 Responsible Persons ... 78
8.1.2 E-mail Distribution List ... 78
8.1.3 Parent PGE(s) ... 78
8.1.4 Target PGE(s) ... 79
8.2 Operating Environment ... 79
8.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) ... 79
8.2.2 Environment Script Requirements ... 79
8.2.3 Execution Frequency (daily, hourly, or monthly) ... 79
8.2.4 Memory/Disk Space/Time Requirements ... 79
8.2.5 Restrictions Imposed in Processing Order ... 79
8.3 Processor Dependencies (Previous PGEs, Ingest Data) ... 80
8.3.1 Input Dataset Name (#1): SSFB ... 80
8.3.2 Input Dataset Name (#2): SSFA ... 80
8.4 Operating Procedures (Procedure for each part of the processor's elements) ... 81
8.4.1 How to Generate the ASCII File and PCF File ... 81
8.4.2 How to Execute the Main Processor ... 81
8.4.3 Special Case Considerations ... 81
8.4.4 Special Reprocessing Instructions ... 81
8.5 Execution Evaluation ... 82
8.5.1 Exit Codes ... 82

TABLE OF CONTENTS

Section Page

8.5.2 Screen Messages (Use Table format for large number of messages) 82

8.5.3 Log and Status Files Results (Include ALL Log Files) 82

8.5.4 Solutions to Possible Problems 82

8.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 83

8.6 Expected Output Dataset(s) 83

8.7 Expected Temporary Files/Directories 84

9.0 PGEName: CER4.5-6.4P1 85

9.1 PGE Details 85

9.1.1 Responsible Persons 85

9.1.2 E-mail Distribution List 85

9.1.3 Parent PGE(s) 85

9.1.4 Target PGE(s): 85

9.2 Operating Environment 86

9.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 86

9.2.2 Environment Script Requirements 86

9.2.3 Execution Frequency (daily, hourly, or monthly) 86

9.2.4 Memory/Disk Space/Time Requirements 86

9.2.5 Restrictions Imposed in Processing Order 86

9.3 Processor Dependencies (Previous PGEs, Ingest Data) 86

9.3.1 Input Dataset Name (#1): SSFB-val 86

9.3.2 Input Dataset Name (#2): SSFA-val 87

9.4 Operating Procedures (Procedure for each part of the processor's elements) 87

9.4.1 How to Generate the ASCII File and PCF File 87

TABLE OF CONTENTS

Section Page

9.4.2 How to Execute the Main Processor 88

9.4.3 Special Case Considerations 88

9.4.4 Special Reprocessing Instructions 88

9.5 Execution Evaluation 88

9.5.1 Exit Codes 88

9.5.2 Screen Messages (Use Table format for large number of messages) 89

9.5.3 Log and Status Files Results (Include ALL Log Files) 89

9.5.4 Solutions to Possible Problems 89

9.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 89

9.6 Expected Output Dataset(s) 90

9.7 Expected Temporary Files/Directories 91

10.0 PGEName: CER4.5-6.4P2 92

10.1 PGE Details 92

10.1.1 Responsible Persons 92

10.1.2 E-mail Distribution List 92

10.1.3 Parent PGE(s) 92

10.1.4 Target PGE(s): 92

10.2 Operating Environment 93

10.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 93

10.2.2 Environment Script Requirements 93

10.2.3 Execution Frequency (daily, hourly, or monthly) 93

10.2.4 Memory/Disk Space/Time Requirements 94

10.2.5 Restrictions Imposed in Processing Order 94

TABLE OF CONTENTS

Section Page

10.3 Processor Dependencies (Previous PGEs, Ingest Data) 94
10.3.1 Input Dataset Name (#1): SSFB-val 94
10.3.2 Input Dataset Name (#2): SSFA-val 94
10.4 Operating Procedures (Procedure for each part of the processor's elements) 95
10.4.1 How to Execute PGE CER4.5-6.4P2 using the Command Line 95
10.4.1.1 How to Generate the ASCII File and PCF File 95
10.4.1.2 How to Execute the Main Processor 95
10.4.2 How to Execute PGE CER4.5-6.4P2 using SGE 95
10.4.3 Special Case Considerations 96
10.4.4 Special Reprocessing Instructions 96
10.5 Execution Evaluation 96
10.5.1 Exit Codes 96
10.5.2 Screen Messages (Use Table format for large number of messages) 97
10.5.3 Log and Status Files Results (Include ALL Log Files) 97
10.5.4 Solutions to Possible Problems 97
10.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 97
10.6 Expected Output Dataset(s) 98
10.7 Expected Temporary Files/Directories 99
11.0 PGEName: CER4.5-6.5P4 100
11.1 PGE Details 100
11.1.1 Responsible Persons 100
11.1.2 E-mail Distribution List 100
11.1.3 Parent PGE(s) 100

TABLE OF CONTENTS

Section Page

11.1.4 Target PGE(s) 101

11.2 Operating Environment 101

11.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 101

11.2.2 Environment Script Requirements 101

11.2.3 Execution Frequency (daily, hourly, or monthly) 102

11.2.4 Memory/Disk Space/Time Requirements 102

11.2.5 Restrictions Imposed in Processing Order 102

11.3 Processor Dependencies (Previous PGEs, Ingest Data) 102

11.3.1 Input Dataset Name (#1): SSFB 102

11.3.2 Input Dataset Name (#2): SSFA 102

11.3.3 Input Dataset Name (#3): MOA 103

11.3.4 Input Dataset Name (#4): GQCI 104

11.3.5 Input Dataset Name (#5): SCCD 104

11.3.6 Input Dataset Name (#6): SCCN 105

11.3.7 Input Dataset Name (#7): IES 105

11.4 Operating Procedures (Procedure for each part of the processor's elements) 106

11.4.1 How to Generate the ASCII File and PCF File 106

11.4.2 How to Execute PGE CER4.5-6.5P4 106

11.4.3 Special Case Considerations 106

11.4.4 Special Reprocessing Instructions 106

11.5 Execution Evaluation 107

11.5.1 Exit Codes 107

11.5.2 Screen Messages (Use Table format for large number of messages) 107

11.5.3 Log and Status Files Results (Include ALL Log Files) 107

TABLE OF CONTENTS

Section Page

11.5.4 Solutions to Possible Problems 107

11.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 108

11.6 Expected Output Dataset(s) 108

11.7 Expected Temporary Files/Directories 109

12.0 PGEName: CER4.5-6.5P5 110

12.1 PGE Details 110

12.1.1 Responsible Persons 110

12.1.2 E-mail Distribution List 110

12.1.3 Parent PGE(s) 110

12.1.4 Target PGE(s) 111

12.2 Operating Environment 111

12.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime) 111

12.2.2 Environment Script Requirements 111

12.2.3 Execution Frequency (daily, hourly, or monthly) 112

12.2.4 Memory/Disk Space/Time Requirements 112

12.2.5 Restrictions Imposed in Processing Order 112

12.3 Processor Dependencies (Previous PGEs, Ingest Data) 112

12.3.1 Input Dataset Name (#1): SSFB 112

12.3.2 Input Dataset Name (#2): SSFA 112

12.3.3 Input Dataset Name (#3): MOA 113

12.3.4 Input Dataset Name (#4): GQCI 114

12.3.5 Input Dataset Name (#5): SCCD 114

12.3.6 Input Dataset Name (#6): SCCN 115

TABLE OF CONTENTS

Section Page

12.3.7 Input Dataset Name (#7): IES 115

12.4 Operating Procedures (Procedure for each part of the processor's elements) 116

12.4.1 How to Generate the ASCII File and PCF File 116

12.4.2 How to Execute PGE CER4.5-6.5P5 116

12.4.3 Special Case Considerations 116

12.4.4 Special Reprocessing Instructions 116

12.5 Execution Evaluation 117

12.5.1 Exit Codes 117

12.5.2 Screen Messages (Use Table format for large number of messages) 117

12.5.3 Log and Status Files Results (Include ALL Log Files) 117

12.5.4 Solutions to Possible Problems 117

12.5.5 Conditions for Subsystem and/or Target PGE(s) Terminal Failure (Halt all further processing) 118

12.6 Expected Output Dataset(s) 118

12.7 Expected Temporary Files/Directories 119

References 120

Appendix A Acronyms and Abbreviations A-1

Appendix B Error Messages for Subsystem 4.5-6 ..... B-1

B.1 Error Messages for CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5. ..... B-2

B.2 Error Messages for CER4.5-6.2P2, CER4.5-6.2P3, and CER4.5-6.2P4 ..... B-4

B.3 Error Messages for CER4.5-6.4P1 and CER4.5-6.4P2 ..... B-5

B.4 Error Messages for CER4.5-6.0P6 ..... B-6

LIST OF TABLES

Table Page

Table 1-1. Subsystem Software Analysts Contacts 8
Table 1-2. Parent PGEs for CER4.5-6.0P6 8
Table 1-3. Target PGEs after CER4.5-6.0P6 9
Table 1-4. Runtime Parameters for CER4.5-6.0P6 9
Table 1-5. Exit Codes for CER4.5-6.0P6 12
Table 1-6. Expected Output File Listing for CER4.5-6.0P6 13
Table 1-7. Temporary Files Listing for CER4.5-6.0P6 14
Table 2-1. Subsystem Software Analysts Contacts 15
Table 2-2. Parent PGEs for CER4.5-6.1P2 15
Table 2-3. Target PGEs after CER4.5-6.1P2 16
Table 2-4. Runtime Parameters for CER4.5-6.1P2 16
Table 2-5. Exit Codes for CER4.5-6.1P2 21
Table 2-6. Expected Output File Listing for CER4.5-6.1P2 23
Table 2-7. Temporary Files Listing for CER4.5-6.1P2 24
Table 3-1. Subsystem Software Analysts Contacts 25
Table 3-2. Parent PGEs for CER4.5-6.1P3 25
Table 3-3. Target PGEs after CER4.5-6.1P3 26
Table 3-4. Runtime Parameters for CER4.5-6.1P3 26
Table 3-5. Exit Codes for CER4.5-6.1P3 31
Table 3-6. Expected Output File Listing for CER4.5-6.1P3 33
Table 3-3-7. Temporary Files Listing for CER4.5-6.1P3 34
Table 4-1. Subsystem Software Analysts Contacts 35
Table 4-2. Parent PGEs for CER4.5-6.1P6 35

LIST OF TABLES

Table Page

Table 4-3. Target PGEs after CER4.5-6.1P6 36
Table 4-4. Runtime Parameters for CER4.5-6.1P6 36
Table 4-5. Exit Codes for CER4.5-6.1P6 46
Table 4-6. Expected Output File Listing for CER4.5-6.1P6 47
Table 4-7. Temporary Files Listing for CER4.5-6.1P6 48
Table 5-1. Subsystem Software Analysts Contacts 49
Table 5-2. Parent PGEs for CER4.5-6.1P7 49
Table 5-3. Target PGEs after CER4.5-6.1P7 50
Table 5-4. Runtime Parameters for CER4.5-6.1P7 50
Table 5-5. Exit Codes for CER4.5-6.1P7 60
Table 5-6. Expected Output File Listing for CER4.5-6.1P7 61
Table 5-7. Temporary Files Listing for CER4.5-6.1P7 62
Table 6-1. Subsystem Software Analysts Contacts 63
Table 6-2. Parent PGEs for CER4.5-6.2P2 63
Table 6-3. Target PGEs after CER4.5-6.2P2 64
Table 6-4. Runtime Parameters for CER4.5-6.2P2 64
Table 6-5. Exit Codes for CER4.5-6.2P2 67
Table 6-6. Expected Output File Listing for CER4.5-6.2P2 68
Table 6-7. Temporary Files Listing for CER4.5-6.2P2 69
Table 7-1. Subsystem Software Analysts Contacts 70
Table 7-2. Parent PGEs for CER4.5-6.2P3 70
Table 7-3. Target PGEs after CER4.5-6.2P3 71
Table 7-4. Runtime Parameters for CER4.5-6.2P3 71

LIST OF TABLES

Table Page

Table 7-5. Exit Codes for CER4.5-6.2P3 75
Table 7-6. Expected Output File Listing for CER4.5-6.2P3 76
Table 7-7. Temporary Files Listing for CER4.5-6.2P3 77
Table 8-1. Subsystem Software Analysts Contacts 78
Table 8-2. Parent PGEs for CER4.5-6.2P4 78
Table 8-3. Target PGEs after CER4.5-6.2P4 79
Table 8-4. Runtime Parameters for CER4.5-6.2P4 79
Table 8-5. Exit Codes for CER4.5-6.2P4 82
Table 8-6. Expected Output File Listing for CER4.5-6.2P4 83
Table 8-7. Temporary Files Listing for CER4.5-6.2P4 84
Table 9-1. Subsystem Software Analysts Contacts 85
Table 9-2. Parent PGEs for CER4.5-6.4P1 85
Table 9-3. Runtime Parameters for CER4.5-6.4P1 86
Table 9-4. Exit Codes for CER4.5-6.4P1 89
Table 9-5. Expected Output File Listing for CER4.5-6.4P1 90
Table 9-6. Temporary Files Listing for CER4.5-6.4P1 91
Table 10-1. Subsystem Software Analysts Contacts 92
Table 10-2. Parent PGEs for CER4.5-6.4P2 92
Table 10-3. Runtime Parameters for CER4.5-6.4P2 93
Table 10-4. Exit Codes for CER4.5-6.4P2 97
Table 10-5. Expected Output File Listing for CER4.5-6.4P2 98
Table 10-6. Temporary Files Listing for CER4.5-6.4P2 99
Table 11-1. Subsystem Software Analysts Contacts 100

LIST OF TABLES

Table Page

Table 11-2. Parent PGEs for CER4.5-6.5P4 100

Table 11-3. Target PGEs after CER4.5-6.5P4 101

Table 11-4. Runtime Parameters for CER4.5-6.5P4 101

Table 11-5. Exit Codes for CER4.5-6.5P4 107

Table 11-6. Expected Output File Listing for CER4.5-6.5P4 108

Table 11-7. Temporary Files Listing for CER4.5-6.5P4 109

Table 12-1. Subsystem Software Analysts Contacts 110

Table 12-2. Parent PGEs for CER4.5-6.5P5 110

Table 12-3. Target PGEs after CER4.5-6.5P5 111

Table 12-4. Runtime Parameters for CER4.5-6.5P5 111

Table 12-5. Exit Codes for CER4.5-6.5P5 117

Table 12-6. Expected Output File Listing for CER4.5-6.5P5 118

Table 12-7. Temporary Files Listing for CER4.5-6.5P5 119

Table B-1. PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5 Error Messages B-2

Table B-2. PGEs CER4.5-6.2P2, CER4.5-6.2P3, and PGE CER4.5-6.2P4 Error Messages B-4

Table B-3. PGEs CER4.5-6.4P1 and CER4.5-6.4P2 Error Messages B-5

Table B-4. PGEs CER4.5-6.0P6 Error Messages B-6

Introduction

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

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

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

Document Overview

This document, CERES Inversion to Instantaneous Top-of-Atmosphere (TOA) Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Release 5 Operator's Manual, is part of the CERES Subsystems 4.5 and 4.6 delivery package provided to the Langley Atmospheric Science Data Center (ASDC). It provides a description of the CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget 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), CER4.5-6.0P6, CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.2P2, CER4.5-6.2P3, CER4.5-6.2P4, CER4.5-6.4P1, CER4.5-6.4P2, CER4.5-6.5P4 and CER4.5-6.5P5 is contained in Appendix B.

This document is organized as follows:

Introduction
Document Overview
Subsystem Overview
1.0 PGEName: CER4.5-6.0P6
1.0 PGEName: CER4.5-6.1P2
3.0 PGEName: CER4.5-6.1P3
4.0 PGEName: CER4.5-6.1P6
5.0 PGEName: CER4.5-6.1P7
6.0 PGEName: CER4.5-6.2P2
7.0 PGEName: CER4.5-6.2P3
8.0 PGEName: CER4.5-6.2P4
9.0 PGEName: CER4.5-6.4P1
10.0 PGEName: CER4.5-6.4P2
11.0 PGEName: CER4.5-6.5P4
12.0 PGEName: CER4.5-6.5P5
References
Appendix A - Acronyms and Abbreviations
Appendix B - Error Messages for Subsystem 4.5-6

Subsystem Overview

CER4.5-6.0P6 = CERES Sea Ice Brightness Index Inversion Subsystem 4.5 Pre Processor for Terra and Aqua Edition4 and NPP Processing

The Edition4 ADMs for fresh snow and sea ice scene types rely on the MODIS spectral information for scene classification. For clear-sky and partly cloudy sky scenes this information is computed using the clear-sky radiances. For overcast scenes where we can't see the surface, a monthly map of the relevant value is used to determine which ADM to use.

For sea ice scenes the Sea Ice Brightness Index (SIBI) is used to determine the ADM type. The SIBI is defined as 1.0-(ref_0469-ref_0858)/(ref_0469+ref_0858), where ref_0469 is the clear-sky reflectance in the 0.469 micron band and ref_0858 is the clear-sky reflectance in the 0.858 micron band.

The code reads in the cross-track SSF files for each month and outputs the mean SIBI in each grid box defined by the CERES nested-grid routine. For the SIBI, the conditions require that there be some sea ice present from at least one of sfc_type (ssf-25 & ssf-26) and/or snow_ice (ssf-69). The cloud fraction must be greater than or equal to 0% and less than 99%. The SIBI value is calculated in the main program. The FOV's are looped over and the respective values are summed for each grid box and the count is kept. Once the month has finished processing the mean value (sum/count) is output for each region that has a count greater than zero.

CER4.5-6.1P2 and CER4.5-6.1P3 - CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for Terra and Aqua Processing

The Main Processor converts CERES filtered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. CER4.5-6.1P2 processes Terra data and CER4.5-6.1P3 processes Aqua data.

CERES Inversion Subsystem 4.5 calculates estimates of the radiant flux at the TOA based on input from the Preliminary Single Scanner Footprint (PRE_SSF) produced by the Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function (PSF) Subsystem 4.4. This inversion process is dependent on several factors, including Earth surface features; the extent of cloudiness; and the relative geometry of the spacecraft, the Sun, and the measurement field-of-view. Each radiometric measurement is spectrally corrected to give an unfiltered measurement. Estimates of the radiant flux at the TOA are computed based on scene information, geometrical considerations, and the unfiltered measurements.

Surface Flux Estimation, Subsystem 4.6, calculates estimates of radiant flux at the Earth's surface based on TOA fluxes calculated in Subsystem 4.5. Additional input data required by Subsystem 4.6 include precipitable water, surface emissivity, and cloud properties from the PRE_SSF. Pressure, temperature, and humidity profiles are from a Meteorological, Ozone, and Aerosol (MOA) Product. Model A Shortwave (SW) net and downward surface fluxes are estimated using the Li-Leighton algorithm. Model B SW downward surface fluxes are estimated using the Staylor algorithm. Model A Longwave (LW) net and downward surface fluxes are estimated using the Ramanathan-Inamdar Algorithm. Model B LW net and downward surface fluxes are estimated using the Gupta Algorithm.

The output of Subsystems 4.5 and 4.6 Main Processor consists of a binary Single Scanner Footprint (SSF) product and an SSF binary Aerosol (SSFA) product, which serves as input for CERES Subsystems 5.0 and 9.0, an ASCII Quality Control (QC) report, a binary QC file, and an SSF product in Hierarchical Data Format (HDF).

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 and HDF Postprocessor for Terra and Aqua Edition4 Processing

The Main Processor converts CERES filtered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. CER4.5-6.1P6 processes both Terra and Aqua data.

CERES Inversion Subsystem 4.5 calculates estimates of the radiant flux at the TOA based on input from the Preliminary Single Scanner Footprint (PRE_SSF) produced by the Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function (PSF) Subsystem 4.4. This inversion process is dependent on several factors, including Earth surface features; the extent of cloudiness; and the relative geometry of the spacecraft, the Sun, and the measurement

field-of-view. Each radiometric measurement is spectrally corrected to give an unfiltered measurement. Estimates of the radiant flux at the TOA are computed based on scene information, geometrical considerations, and the unfiltered measurements.

Surface Flux Estimation, Subsystem 4.6, calculates estimates of radiant flux at the Earth's surface based on TOA fluxes calculated in Subsystem 4.5. Additional input data required by Subsystem 4.6 include precipitable water, surface emissivity, and cloud properties from the PRE_SSF. Pressure, temperature, and humidity profiles are from a Meteorological, Ozone, and Aerosol (MOA) Product. Model A Shortwave (SW) net and downward surface fluxes are estimated using the Li-Leighton algorithm. Model B SW downward surface fluxes are estimated using the Staylor algorithm. Model A Longwave (LW) net and downward surface fluxes are estimated using the Ramanathan-Inamdar Algorithm. Model B LW net and downward surface fluxes are estimated using the Gupta Algorithm. Model C LW net and downward surface fluxes are estimated using the Zhou-Cess Algorithm.

The output of Subsystems 4.5 and 4.6 Main Processor consists of a binary Single Scanner Footprint (SSF) product and an SSF binary Aerosol (SSFA) product, which serves as input for CERES Subsystems 5.0 and 9.0, an ASCII Quality Control (QC) report, a binary QC file, and an SSF product in Hierarchical Data Format (HDF).

CER4.5-6.1P7 - CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for S-NPP Processing

The Main Processor converts CERES filtered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. CER4.5-6.1P7 processes S-NPP data.

CERES Inversion Subsystem 4.5 calculates estimates of the radiant flux at the TOA based on input from the Preliminary Single Scanner Footprint (PRE_SSF) produced by the Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function (PSF) Subsystem 4.4. This inversion process is dependent on several factors, including Earth surface features; the extent of cloudiness; and the relative geometry of the spacecraft, the Sun, and the measurement field-of-view. Each radiometric measurement is spectrally corrected to give an unfiltered measurement. Estimates of the radiant flux at the TOA are computed based on scene information, geometrical considerations, and the unfiltered measurements.

Surface Flux Estimation, Subsystem 4.6, calculates estimates of radiant flux at the Earth's surface based on TOA fluxes calculated in Subsystem 4.5. Additional input data required by Subsystem 4.6 include precipitable water, surface emissivity, and cloud properties from the PRE_SSF. Pressure, temperature, and humidity profiles are from a Meteorological, Ozone, and Aerosol (MOA) Product. Model A Shortwave (SW) net and downward surface fluxes are estimated using the Li-Leighton algorithm. Model B SW downward surface fluxes are estimated using the Staylor algorithm. Model A Longwave (LW) net and downward surface fluxes are estimated using the Ramanathan-Inamdar Algorithm. Model B LW net and downward surface

fluxes are estimated using the Gupta Algorithm. Model C LW net and downward surface fluxes are estimated using the Zhou-Cess Algorithm.

The output of Subsystems 4.5 and 4.6 Main Processor consists of a binary Single Scanner Footprint (SSF) product and an SSF binary Aerosol (SSFA) product, which serves as input for CERES Subsystems 5.0 and 9.0, an ASCII Quality Control (QC) report, a binary QC file, and an SSF product in Hierarchical Data Format (HDF).

CER4.5-6.2P2 - CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Edition1 and Edition2

The Postprocessor reads up to 24 hourly binary Terra or Aqua SSF products as input and generates two daily binary, packed SSF subset files, one containing daytime footprints and the other containing nighttime footprints. The number of parameters on each footprint is reduced and the modified footprint is packed using a scale factor and offset. Footprints with a solar zenith angle of less than 90 degrees are written to the daytime SSF subset file and footprints with a solar zenith angle greater than or equal to 90 degrees are written to the nighttime SSF subset file. For Terra or Aqua processing, the SSFA file is also subsetted and a daytime SSF aerosol binary file is created. The same footprints that were placed on the daytime SSF subset file are selected for the SSF aerosol subset file.

A daily binary and an HDF SSF Nadir product, a daily binary SSF validation product, a daily binary SSF Aerosol validation product, a daily daytime binary SSF SCOOL validation product, and a daily nighttime binary SSF SCOOL validation product are also created by this PGE. The SSF Nadir product contains the nadir viewing SSF footprints from 24 hours of SSF data. The binary SSF and SSF Aerosol validation products contains all SSF footprints over CERES validation sites from 24 hours of SSF data. The daytime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle of less than 90 degrees. The nighttime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle greater than or equal to 90 degrees.

CER4.5-6.2P3 - CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Edition4 and NPP Edition1

The Postprocessor reads up to 24 hourly binary Terra or Aqua SSF products as input and generates two daily binary, packed SSF subset files, one containing daytime footprints and the other containing nighttime footprints. The number of parameters on each footprint is reduced and the modified footprint is packed using a scale factor and offset. Footprints with a solar zenith angle of less than 90 degrees are written to the daytime SSF subset file and footprints with a solar zenith angle greater than or equal to 90 degrees are written to the nighttime SSF subset file. For Terra or Aqua processing, the SSFA file is also subsetted and a daytime SSF aerosol binary file is created. The same footprints that were placed on the daytime SSF subset file are selected for the SSF aerosol subset file.

A daily binary and an HDF SSF Nadir product, a daily binary SSF validation product, a daily binary SSF Aerosol validation product, a daily daytime binary SSF SCOOL validation product, and a daily nighttime binary SSF SCOOL validation product are also created by this PGE. The SSF Nadir product contains the nadir viewing SSF footprints from 24 hours of SSF data. The binary SSF and SSF Aerosol validation products contains all SSF footprints over CERES validation sites from 24 hours of SSF data. The daytime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle of less than 90 degrees. The nighttime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle greater than or equal to 90 degrees.

CER4.5-6.2P4 - CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Edition3

The Postprocessor reads up to 24 hourly binary Terra or Aqua SSF products as input and generates two daily binary, packed SSF subset files, one containing daytime footprints and the other containing nighttime footprints. The number of parameters on each footprint is reduced and the modified footprint is packed using a scale factor and offset. Footprints with a solar zenith angle of less than 90 degrees are written to the daytime SSF subset file and footprints with a solar zenith angle greater than or equal to 90 degrees are written to the nighttime SSF subset file. For Terra or Aqua processing, the SSFA file is also subsetted and a daytime SSF aerosol binary file is created. The same footprints that were placed on the daytime SSF subset file are selected for the SSF aerosol subset file.

A daily binary and an HDF SSF Nadir product, a daily binary SSF validation product, a daily binary SSF Aerosol validation product, a daily daytime binary SSF SCOOL validation product, and a daily nighttime binary SSF SCOOL validation product are also created by this PGE. The SSF Nadir product contains the nadir viewing SSF footprints from 24 hours of SSF data. The binary SSF and SSF Aerosol validation products contains all SSF footprints over CERES validation sites from 24 hours of SSF data. The daytime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle of less than 90 degrees. The nighttime binary SSF SCOOL validation product contains all subsetted footprints over SCOOL validation sites which have a solar zenith angle greater than or equal to 90 degrees.

CER4.5-6.4P1 - CERES Subsystems 4.5 and 4.6 Monthly Validation Site SSF Postprocessor for Terra and Aqua Editions 1, 2, and 3

The Postprocessor reads up to 31 daily Validation Site SSF products as input and generates a monthly binary SSF validation site product containing all SSF footprints over CERES validation sites from an entire month of SSF data.

CER4.5-6.4P2 - CERES Subsystems 4.5 and 4.6 Monthly Validation Site SSF Postprocessor for Terra and Aqua for Edition4 and NPP Edition1

The Postprocessor reads up to 31 daily Validation Site SSF products as input and generates a monthly binary SSF validation site product containing all SSF footprints over CERES validation sites from an entire month of SSF data.

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

This Alternate Main Processor converts CERES unfiltered radiance measurements to instantaneous radiative flux estimates at the top of the Earth's atmosphere and produces radiative flux estimates at the Earth's surface for each CERES footprint. This processor uses an archived IES file for input and replaces all corresponding data. It also uses a binary SSF as input and only the TOA and surface fluxes are replaced. PGE CER4.5-6.5P4 processes Terra data and PGE CER4.5-6.5P5 processes Aqua data. Both PGEs also unfilter the CERES radiances.

CERES Inversion Subsystem 4.5 calculates estimates of the radiant flux at the TOA based on input from an archived Single Scanner Footprint (SSFB) and updated radiances from the IES. Estimates of the radiant flux at the TOA are computed based on scene information, geometrical considerations, cloud properties, and the unfiltered measurements.

Surface Flux Estimation, Subsystem 4.6, calculates estimates of radiant flux at the Earth's surface based on TOA fluxes calculated in Subsystem 4.5. Additional input data required by Subsystem 4.6 include precipitable water, surface emissivity, and cloud properties from the SSFB. Pressure, temperature, and humidity profiles are from a Meteorological, Ozone, and Aerosol (MOA) Product. Model A Shortwave (SW) net and downward surface fluxes are estimated using the Li-Leighton algorithm. Model B SW downward surface fluxes are estimated using the Staylor algorithm. Model A Longwave (LW) net and downward surface fluxes are estimated using the Ramanathan-Inamdar Algorithm. Model B LW net and downward surface fluxes are estimated using the Gupta Algorithm.

The output of Subsystems 4.5 and 4.6 Alternate Main Processor consists of a binary Single Scanner Footprint (SSF) Edition3 product, a binary QC file, and an SSF product in Hierarchical Data Format (HDF). CER4.5-6.5P4 and CER4.5-6.5P5 also create a binary SSF Aerosol (SSFA) Edition3 product.

1.0 PGEName: CER4.5-6.0P6

CERES Sea Ice Brightness Index Inversion Subsystem 4.5 Pre Processor for Terra and Aqua Edition4 and NPP Processing for *AMI* P6 and x86.

1.1 PGE Details

1.1.1 Responsible Persons

Table 1-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	Victor.E.Sothcott@nasa.gov	Thomas.E.Caldwell@nasa.gov

1.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 1-1.

1.1.3 Parent PGE(s)

Table 1-2. Parent PGEs for CER4.5-6.0P6

PGEName	Description
CER4.1-4.1P6 (REPROCESS=NO)	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
or	
CER4.5-6.1P6 (REPROCESS=YES)	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for Terra and Aqua Edition4 Processing

1.1.4 Target PGE(s)

Table 1-3. Target PGEs after CER4.5-6.0P6

PGEName	Description
CER4.5-6.1P6	CERES Inversion Main Processor for Terra/Aqua Edition4 processing
or CER4.5-1.1P7	CERES Inversion Main Processor for NPP processing

1.2 Operating Environment

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

Table 1-4. Runtime Parameters for CER4.5-6.0P6

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
REPROCESS	Reprocessing using existing SSF data for input or Initial processing using Intermediate SSF files from Clouds processing for input.	a(3)	YES, NO
InputArchiveInt	Sets the upper level working directory of the intermediate Clouds input data. (REPROCESS=NO)	char	
InputArchive	Sets the upper level working directory of the SSF input data. (REPROCESS=YES)	char	

1.2.2 Environment Script Requirements

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

The following environment variables must be set:

If REPROCESS = YES
SS4_6 - Sampling Strategy for Inversion Input, see Production Request
PS4_6 - Production Strategy for Inversion Input, see Production Request
CC4_6 - Configuration Code for Inversion input, see CM Database

If REPROCESS = NO

SS4_1P6	-	Sampling Strategy for Clouds (Cookiecutter), see Production Request
PS4_1	-	Production Strategy for Clouds input, see Production Request
CC4_1	-	Configuration Code for Clouds, see CM Database
SS4_11	-	Sampling Strategy for Sea-Ice Map, see Production Request
PS4_11	-	Production Strategy for Sea-Ice Map, see Production Request
CC4_11	-	Configuration Code for Sea-Ice Map, see CM Database
DATA4_6	-	Historical number of unknown purpose, set to 000
DATA4_11	-	Historical number of unknown purpose, set to 000
SW4_6	-	Historical number of unknown purpose, set to 000
SW4_11	-	Historical number of unknown purpose, set to 000
IMAG	-	Imager – MODIS, VIIRS
INST	-	Instrument name – FM1, FM2, FM3, FM4, FM5
SAT	-	Satellite – Terra, Aqua, NPP
SCCR	-	Software SCCR number

1.2.3 Execution Frequency (daily, hourly, or monthly)

monthly - This PGE is to be processed once per data-month, a maximum total of 744 hours per month, when input is available.

1.2.4 Memory/Disk Space/Time Requirements

Memory:	109 MB
Disk Space:	300 KB
Total Run Time:	24:20 minutes

1.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 1.3).

1.3 Processor Dependencies (Previous PGEs, Ingest Data)

1.3.1 Input Dataset Name (#1): SSFI

a. Directory Location/Inputs Expected:

   $InputArchiveInt/CERES/SSFI/$SS4_1P6_$PS4_1/YYYY/MM
   CER_SSFI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH (DD = 1 .. 31, HH = 0 .. 23)

   1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P6

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): **203**

1.3.2 Input Dataset Name (#1): SSFB

a. Directory Location/Inputs Expected:

$InputArchive/SSFB/$SS4_6_$PS4_6/YYYY/MM
CER_SSFB_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH (DD = 01 .. 31, HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P6

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): **189.3**

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

The Main Processor and Postprocessor production script, **run_4.5-6.0P6.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **CER4.5-6.0P6_pcf_gen.pl**.

1.4.1.1 How to Execute PGE CER4.5-6.0P6 using SGE

Execute the production script by typing the script name, **CER4.5-6.0P6-SGE_Driver.pl**, followed by the date and hour options.

To run a single month:

```
> cd $CERESHOME/inversion/CER4.5-6.0P6/rcf
> $CERESHOME/inversion/CER4.5-6.0P6/rcf/CER4.5-6.0P6-SGE_Driver.pl -date
  YYYYMM
```

There are several optional arguments for **CER4.5-6.0P6-SGE_Driver.pl**:

```
usage:      CER4.5-6.0P6-SGE_Driver.pl [options]
[-help]     Display this help message.
```

[-clean]	Delete any existing outputs that are encountered.
[-platform CPU]	Run the PGE on the platform designated by CPU (i.e., *p6* or *x86*)
[-date YYYYMM]	Run the PGE on the data date specified by YYYYMM.
[-start YYYYMM]	Run the PGE starting on the data date specfied by YYYYMM.
[-end YYYYMM]	Run the PGE stopping on the data date specified by YYYYMM.

1.4.1.2 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.

1.4.1.3 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.0P6.pl**, has been designed to check for these files and 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 CER4.5-6.0P6 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 1-5. 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 Table 1-1) for assistance.

Table 1-5. Exit Codes for CER4.5-6.0P6

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.0P6.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output file that does not exist. This does not signify a problem.

1.5.3 Log and Status Files Results (Include <u>ALL</u> Log Files)

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

1. Report Log File: CER4.5-6.0P6_LogReport_$SS4_11_$PS4_11_$CC4_11.YYYYMM

The Report Log File contains the Inversion 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: CER4.5-6.0P6_LogStatus_$SS4_11_$PS4_11_$CC4_11.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: CER4.5-6.0P6_LogUser_$SS4_11_$PS4_11_$CC4_11.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

As mentioned in Section 1.4.1.3, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.0P6.pl**, 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 Subsystem 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 per month.

Table 1-6. Expected Output File Listing for CER4.5-6.0P6

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_sibiMap_$SS4_11_$PS4_11_$CC4_11.YYYYMM@ ($CERESHOME/inversion/data/sibiMap/$SS4_11_ $PS4_11/YYYY/MM)	m	.3	1/mn	CER4.5-6.1P6, CER4.5-6.1P7	DPO, Archive, rm	No
CER4.5-6.0P6_PCF_$SS4_11_$PS4_11_$CC4_11. YYYYMM@($CERESHOME/inversion/CER4.5-6.0P6/rcf/pcf)	m	.01	1/mn	N/A	Archive, rm	No
CER4.5-6.0P6_PCF_$SS4_11_$PS4_11_$CC4_11. YYYYMM.log@($CERESHOME/inversion/ CER4.5-6.0P6/rcf/pcf)	m	.01	1/mn	N/A	Archive, rm	No

Table 1-6. Expected Output File Listing for CER4.5-6.0P6

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER4.5-6.0P6_LogReport_$SS4_11_$PS4_11_$CC4_11. YYYYMM@($CERESHOME/inversion/runlogs)	m	.05	1/mn	N/A	Archive, rm	No
CER4.5-6.0P6_LogStatus_$SS4_11_$PS4_11_$CC4_11. YYYYMM@($CERESHOME/inversion/runlogs)	m	.005	1/mn	N/A	Archive, rm	No
CER4.5-6.0P6_LogUser_$SS4_11_$PS4_11_$CC4_11. YYYYMM@($CERESHOME/inversion/runlogs)	m	.003	1/mn	N/A	Archive, rm	No
CER4.5-6.0P6_$SS4_11_$PS4_11_$CC4_11. YYYYMM.<processid>@($CERESHOME/inversion/sge_logs /CER4.5-6.0P6)	m	.003	1/mn	N/A	Archive, rm	No

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/)
rm - remove
YYYY - 4 digit year
MM - 2 digit month {valid values: 01 .. 12}
m - mandatory output
o - optional output
hr - hour

1.7 Expected Temporary Files/Directories

Table 1-7. Temporary Files Listing for CER4.5-6.0P6

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMM
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMM

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
SS - Sampling Strategy - $SS4_11
PS - Production Strategy - $PS4_11
CC - Configuration Code - $CC4_11

2.0 PGEName: CER4.5-6.1P2

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for Terra Processing

2.1 PGE Details

2.1.1 Responsible Persons

Table 2-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

2.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 2-1.

2.1.3 Parent PGE(s)

Table 2-2. Parent PGEs for CER4.5-6.1P2

PGEName	Description
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients
CER4.1-4.1P4	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)

2.1.4 Target PGE(s)

Table 2-3. Target PGEs after CER4.5-6.1P2

PGEName	Description
CER4.5-6.2P2	Postprocessor for SSF Subset Generation
CER5.0P2	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P2	Grid TOA and Surface Fluxes

2.2 Operating Environment

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

Table 2-4. Runtime Parameters for CER4.5-6.1P2

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23

2.2.2 Environment Script Requirements

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

The following environment variables must be set:

SS4_1 - Sampling Strategy for Clouds (Cookiecutter), see Production Request
SS4_5 - Sampling Strategy for Inversion Output, see Production Request
SS2 - Sampling Strategy for CER2.4P1 input, see CM Database
SS12 - Sampling Strategy for RegridMOA, see Production Request
PS4_1 - Production Strategy for Clouds, see CM Database
PS2_4 - Production Strategy for CER2.4P1 input, see CM Database (not required if PS4_7 is set to "DefaultSCC")
PS4_5 - Production Strategy for Inversion, see Production Request
PS4_7 - Production Strategy (normally set to "Null") set to "DefaultSCC" when default Spectral correction Coefficients are to be used
PS12 - Production Strategy for RegridMOA, see Production Request
CC4_1 - Configuration Code for Clouds, see CM Database

CC2_4 - Configuration Code for CER2.4P1 input, see CM Database (not required if PS4_7 is set to "DefaultSCC")
CC4_5 - Configuration Code for CER4.5-6.1P2 and CER4.5-6.1P3, see CM Database
CC12 - Configuration Code for RegridMOA, see CM Database

2.2.3 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.

2.2.4 Memory/Disk Space/Time Requirements

Memory:	298143 K
Disk Space:	679 Megabytes
Total Run Time:	4:20 minutes

2.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 2.3).

2.3 Processor Dependencies (Previous PGEs, Ingest Data)

2.3.1 Input Dataset Name (#1): SSFI

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

$InputArchiveInt/SSF_Int/$SS4_1_$PS4_1/YYYY/MM/CER_SSFI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P4

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **203**

2.3.2 Input Dataset Name (#2): SSFAI

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

$InputArchiveInt/SSF_Int/$SS4_1_$PS4_1/YYYY/MM/CER_SSFAI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P4

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **26**

2.3.3 Input Dataset Name (#3): FQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $InputArchiveInt/FQC/$SS4_1_$PS4_1/YYYY/MM/CER_FQCI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

   Source PGE: CER4.1-4.1P4

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**

2.3.4 Input Dataset Name (#4): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $InputArchive/MOA/$SS12_$PS12/YYYY/MM/CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

2.3.5 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2_4/YYYY/MM/CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.60**

2.3.6 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2_4/YYYY/MM/CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

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

The Main Processor and Postprocessor production script, **run_4.5-6.1P2.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **CER4.5-6.1P2_pcf_gen.pl**.

2.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **CER4.5-6.1P2_pcf_gen.pl**, creates the PCF file.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.1P2/rcf
> $CERESHOME/inversion/CER4.5-6.1P2/rcf/CER4.5-6.1P2_pcf_gen.pl -date
    YYYYMMDDHH
```

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.1P2/rcf/pcf/**:

CER4.5-6.1P2_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

2.4.2 How to Execute PGE CER4.5-6.1P2

Execute the production script by typing the script name, **run_4.5-6.1P2.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 2-4.

At the command line (>) type:

```
>cd $CERESHOME/inversion/CER4.5-6.1P2/rcf
>$CERESHOME/inversion/CER4.5-6.1P2/rcf/run_4.5-6.1P2.pl
    $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH
```

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P2.pl**, has been designed to check for these files and 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 CER4.5-6.1P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 2-5. 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 Table 2-1) for assistance.

Table 2-5. Exit Codes for CER4.5-6.1P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.1P2.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. Report Log File: CER4.5-6.1P2_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion 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: CER4.5-6.1P2_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.1P2_LogUser_$SS4_5_$PS4_5_$CC4_5.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.

2.5.4 Solutions to Possible Problems

As mentioned in Section 2.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P2.pl**, 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 Subsystem 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 744 times, maximum, in a 31 day month.

Table 2-6. Expected Output File Listing for CER4.5-6.1P2

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFB/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P1, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFA/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P1, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER_GQCA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCA/$SS4_5_ $PS4_5/YYYY/MM)	m	.02	1/hr	N/A	DPO, Archive, rm	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER4.5-6.1P2_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.1P2/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P2_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH.log@($CERESHOME/inversion/CER4.5-6.1P2/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P2_LogReport_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.05	1/hr	N/A	Archive, rm	No
CER4.5-6.1P2_LogStatus_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.005	1/hr	N/A	Archive, rm	No
CER4.5-6.1P2_LogUser_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.03	1/hr	N/A	Archive, rm	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/)
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
hr - hour

2.7 Expected Temporary Files/Directories

Table 2-7. Temporary Files Listing for CER4.5-6.1P2

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy - $SS4_5
PS - Production Strategy - $PS4_5
CC - Configuration Code - $CC4_5

3.0 PGEName: CER4.5-6.1P3

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for Aqua Processing

3.1 PGE Details

3.1.1 Responsible Persons

Table 3-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

3.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 3-1.

3.1.3 Parent PGE(s)

Table 3-2. Parent PGEs for CER4.5-6.1P3

PGEName	Description
CER4.1-4.1P5	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)

3.1.4 Target PGE(s)

Table 3-3. Target PGEs after CER4.5-6.1P3

PGEName	Description
CER4.5-6.2P2	Postprocessor for SSF Subset Generation
CER5.0P2	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P2	Grid TOA and Surface Fluxes

3.2 Operating Environment

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

Table 3-4. Runtime Parameters for CER4.5-6.1P3

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23

3.2.2 Environment Script Requirements

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

The following parameters are used by this PGE:

SS4_1 - Sampling Strategy for Clouds (Cookiecutter), see Production Request
SS4_5 - Sampling Strategy for Inversion Output, see Production Request
SS12 - Sampling Strategy for RegridMOA, see Production Request
SS2 - Sampling Strategy for CER2.4P1 input, see CM Database
PS4_5 - Production Strategy for CER4.5-6.1P3, see Production Request
PS4_7 - Production Strategy (normally set to "Null") set to "DefaultSCC" when default Spectral Correction Coefficients are to be used
PS4_1 - Production Strategy for Clouds input, see Production Request
PS12 - Production Strategy for RegridMOA, see Production Request
PS2_4 - Production Strategy for CER2.4P1 input, see CM Database (not required if PS4_7 is set to "DefaultSCC")
CC4_1 - Configuration Code for Clouds, see CM Database
CC4_5 - Configuration Code for CER4.5-6.1P2 and CER4.5-6.1P3, see CM Database

CC12 - Configuration Code for RegridMOA, see CM Database
CC2_4 - Configuration Code for CER2.4P1 input, see CM Database (not required if PS4_7 is set to "DefaultSCC")

3.2.3 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.

3.2.4 Memory/Disk Space/Time Requirements

Memory:	296009 K
Disk Space:	679 Megabytes
Total Run Time:	4:20 minutes

3.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 3.3).

3.3 Processor Dependencies (Previous PGEs, Ingest Data)

3.3.1 Input Dataset Name (#1): SSFI

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

$InputArchiveInt/SSF_Int/$SS4_1_$PS4_1/YYYY/MM/CER_SSFI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P5

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **203**

3.3.2 Input Dataset Name (#2): SSFAI

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

$InputArchiveInt/SSF_Int/$SS4_1_$PS4_1/YYYY/MM/CER_SSFAI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P5

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **26**

3.3.3 Input Dataset Name (#3): FQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $InputArchiveInt/FQC/$SS4_1_$PS4_1/YYYY/MM/CER_FQCI_$SS4_1_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

   Source PGE: CER4.1-4.1P5

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**

3.3.4 Input Dataset Name (#4): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $InputArchive/MOA/$SS12_$PS12/YYYY/MM/CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH

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

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

3.3.5 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2_4/YYYY/MM/CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.60**

3.3.6 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2_4/YYYY/MM/CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

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

The Main Processor and Postprocessor production script, **run_4.5-6.1P3.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **CER4.5-6.1P3_pcf_gen.pl**.

3.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **CER4.5-6.1P3_pcf_gen.pl**, creates the PCF file.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.1P3/rcf
> $CERESHOME/inversion/CER4.5-6.1P3/rcf/CER4.5-6.1P3_pcf_gen.pl -date
    YYYYMMDDHH
```

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.1P3/rcf/pcf/**:

CER4.5-6.1P3_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

3.4.2 How to Execute PGE CER4.5-6.1P3

Execute the production script by typing the script name, **run_4.5-6.1P3.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 3-4.

At the command line (>) type:

```
>cd $CERESHOME/inversion/CER4.5-6.1P3/rcf
>$CERESHOME/inversion/CER4.5-6.1P3/rcf/run_4.5-6.1P3.pl
    $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH
```

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P3.pl**, has been designed to check for these files and 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 CER4.5-6.1P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 3-5. 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 Table 3-1) for assistance.

Table 3-5. Exit Codes for CER4.5-6.1P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.1P3.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. Report Log File: CER4.5-6.1P3_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion 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: CER4.5-6.1P3_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.1P3_LogUser_$SS4_5_$PS4_5_$CC4_5.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.

3.5.4 Solutions to Possible Problems

As mentioned in Section 3.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P3.pl**, 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 Subsystem 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 744 times, maximum, in a 31 day month.

Table 3-6. Expected Output File Listing for CER4.5-6.1P3

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFB/ $SS4_5_$PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P2, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFA/ $SS4_5_$PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P2, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER_GQCA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCA/$SS4_5_ $PS4_5/YYYY/MM)	m	.02	1/hr	N/A	DPO, Archive, rm	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER4.5-6.1P3_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.1P3/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P3_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH.log@($CERESHOME/inversion/CER4.5-6.1P3/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P3_LogReport_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.05	1/hr	N/A	Archive, rm	No
CER4.5-6.1P3_LogStatus_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.005	1/hr	N/A	Archive, rm	No
CER4.5-6.1P3_LogUser_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.003	1/hr	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/)
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
hr - hour

3.7 Expected Temporary Files/Directories

Table 3-3-7. Temporary Files Listing for CER4.5-6.1P3

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy - $SS4_5
PS - Production Strategy - $PS4_5
CC - Configuration Code - $CC4_5

4.0 PGEName: 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 and HDF Postprocessor for Terra and Aqua Edition4 Processing for *AMI* P6 and x86.

4.1 PGE Details

4.1.1 Responsible Persons

Table 4-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	Victor.E.Sothcott@nasa.gov	Thomas.E.Caldwell@nasa.gov

4.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 4-1.

4.1.3 Parent PGE(s)

Table 4-2. Parent PGEs for CER4.5-6.1P6

PGEName	Description
CER4.1-4.1P6	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)
CER1.4P3	CERES Geolocate and Calibrate Earth Radiances Subsystem 1.0 for TRMM, Terra, Aqua, and NPP
CER4.5-6.1P6	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget
CER4.5-6.0P6	CERES Sea Ice Brightness Index preprocessor

4.1.4 Target PGE(s)

Table 4-3. Target PGEs after CER4.5-6.1P6

PGEName	Description
CER4.5-6.2P3	Postprocessor for SSF Subset Generation
CER5.0P3	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P3	Grid TOA and Surface Fluxes

4.2 Operating Environment

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

Table 4-4. Runtime Parameters for CER4.5-6.1P6

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23
REPROCESS	Reprocessing using existing SSF data for input or Initial processing using Intermediate SSF files from Clouds processing for input.	a(3)	YES, NO
READ_IES	Input an IES file during processing or use the IES data from the SSF input data.	a(3)	YES, NO
InputArchiveInt	Sets the upper level working directory of the intermediate Clouds input data.	char	
InputArchive	Sets the upper level working directory of the MOA, SCC, IES and SSF input data.	char	

4.2.2 Environment Script Requirements

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

The following environment variables must be set:

If REPROCESS = YES

SS4_6	-	Sampling Strategy for Inversion Input, see Production Request
PS4_6	-	Production Strategy for Inversion Input, see Production Request
CC4_6	-	Configuration Code for Inversion input, see CM Database

If REPROCESS = NO

SS4_1P6	-	Sampling Strategy for Clouds (Cookiecutter), see Production Request
PS4_1	-	Production Strategy for Clouds input, see Production Request
CC4_1	-	Configuration Code for Clouds, see CM Database

If READ_IES=YES

SS1_0	-	Sampling Strategy for Instrument, see Production Request
PS1_0	-	Production Strategy for Instrument, see Production Request
CC1_0	-	Configuration Code for Instrument, see CM Database
SS4_11	-	Sampling Strategy for Sea-Ice Map, see Production Request
PS4_11	-	Production Strategy for Sea-Ice Map, see Production Request
CC4_11	-	Configuration Code for Sea-Ice Map, see CM Database
SS4_5	-	Sampling Strategy for Inversion Output, see Production Request
PS4_5	-	Production Strategy for Inversion Output, see Production Request
CC4_5	-	Configuration Code for CER4.5-6.1P5 Output, see CM Database
SS2	-	Sampling Strategy for CER2.4P1 input, see CM Database
CC2_4	-	Configuration Code for CER2.4P1 input, see CM Database
PS2_4	-	Production Strategy for CER2.4P1 input, see CM Database
SS12	-	Sampling Strategy for RegridMOA, see Production Request
PS12	-	Production Strategy for RegridMOA, see Production Request
CC12	-	Configuration Code for RegridMOA, see CM Database
PS4_7	-	Production Strategy (normally set to "Null") set to "DefaultSCC" when default Spectral Correction Coefficients are to be used
DATA4_5	-	Historical number of unknown purpose, set to 000
DATA4_7	-	Historical number of unknown purpose, set to 000
DATA4_8	-	Software SCCR number
DATA4_9	-	Historical number of unknown purpose, set to 000
SW4_5	-	Historical number of unknown purpose, set to 000
SW4_7	-	Historical number of unknown purpose, set to 000
SW4_8	-	Software SCCR number
SW4_9	-	Historical number of unknown purpose, set to 000
IMAG	-	Imager - MODIS
INST	-	Instrument name – FM1, FM2, FM3, FM4
SAT	-	Satellite – Terra, Aqua
SCCR	-	Software SCCR number

4.2.3 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.

4.2.4 Memory/Disk Space/Time Requirements

Memory:	296009 K
Disk Space:	679 Megabytes
Total Run Time:	4:20 minutes

4.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 4.3).

4.3 Processor Dependencies (Previous PGEs, Ingest Data)

4.3.1 Input Dataset Name (#1): SSFI

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

$InputArchiveInt/CERES/SSFI/$SS4_1P6_$PS4_1/YYYY/MM
CER_SSFI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P6

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **203**

4.3.2 Input Dataset Name (#2): SSFAI

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

$InputArchiveInt/CERES/SSFAI/$SS4_1P6_$PS4_1/YYYY/MM
CER_SSFAI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P6

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **26**

4.3.3 Input Dataset Name (#3): FQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchiveInt/CERES/FQCI/$SS4_1P6_$PS4_1/YYYY/MM
CER_FQCI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

Source PGE: CER4.1-4.1P6

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**

4.3.4 Input Dataset Name (#1): SSFB

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

$InputArchive/SSFB/$SS4_6_$PS4_6/YYYY/MM
CER_SSFB_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P6

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): **189.3**

4.3.5 Input Dataset Name (#2): SSFA

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

$InputArchive/SSFA/$SS4_6_$PS4_6/YYYY/MM
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH.met

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P6

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): **26**

4.3.6 Input Dataset Name (#4): GQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GQCI/$SS4_6_$PS4_6/YYYY/MM
CER_GQCI_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER4.5-6.1P6

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): .10

4.3.7 Input Dataset Name (#7): IES

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

$InputArchive/IES/$SS1_$PS1/YYYY/MM
CER_IES_$SS1_0_$PS1_0_$CC1_0.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory if READ_IES = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER1.4P3

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): **32.0**

4.3.8 Input Dataset Name (#4): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/MOA/$SS12_$PS12/YYYY/MM
CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH
CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH.met

or

CER_MOA_$SS12_$PS12_$CC12.H1
CER_MOA_$SS12_$PS12_$CC12.H1.met
CER_MOA_$SS12_$PS12_$CC12.H2
CER_MOA_$SS12_$PS12_$CC12.H2.met

Where **H1 and H2 are the ECMWF or DAS data dates (YYYYMMDDhh, where hh= 00, 06, 12, 18) that are closest to DataDate, YYYYMMDDHH. H1 must be 0-6 hours earlier than YYYMMDDHH and H2 must be 0-6 hours later than YYYYMMDDHH.**

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

4.3.9 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2_4/YYYY/MM
CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.60**

4.3.10 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2_4/YYYY/MM
CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

4.3.11 Input Dataset Name (#7): MATCH-daily

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/MATCH-daily/Terra-Aqua-MODIS_Edition4/YYYY/MM/Terra-Aqua-MODIS_Edition4.YYYYMMDD.nc

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD

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

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

SARB ancillary file.

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.4**

4.3.12 Input Dataset Name (#8): sibiMap

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/sibiMap/$SS4_11_$PS4_11/YYYY/MM/CER_sibiMap_$SS4_11_$PS4_11_$CC4_11.YYYYMM

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM

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

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

Source PGE: CER4.5-6.0P6

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.2**

4.3.13 Input Dataset Name (#9): SORCE TSI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SORCE/sorce_tsi_v15.txt.yyyymmdd

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   None. The year/month/day designation relates to the last date within the file.
3. Waiting Period: **None. Process when all input data are available.**

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

SORCE TSI Climate Experiment

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.1**

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

The Main Processor and Postprocessor production script, **run_4.5-6.1P6.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **CER4.5-6.1P6_pcf_gen.pl**.

4.4.1 How to Execute PGE CER4.5-6.1P6 using the Command Line

4.4.1.1 How to Generate the ASCII File and PCF File

The PCF generator, **CER4.5-6.1P6_pcf_gen.pl**, creates the ASCII input file and the PCF file.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.1P6/rcf
> $CERESHOME/inversion/CER4.5-6.1P6/rcf/CER4.5-6.1P6_pcf_gen.pl
    YYYYMMDDHH
```

The following file will be generated in **$CERESHOME/inversion/CER4.5-6.1P6/rcf/pcf/**:

CER4.5-6.1P6_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

4.4.1.2 How to Execute PGE CER4.5-6.1P6

Execute the production script by typing the script name, **run_4.5-6.1P6.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 4-4.

At the command line (>) type:

>cd $CERESHOME/inversion/CER4.5-6.1P6/rcf
>$CERESHOME/inversion/CER4.5-6.1P6/rcf/run_4.5-6.1P6.pl $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

4.4.1.3 How to Execute PGE CER4.5-6.1P6 using SGE

Execute the production script by typing the script name, **CER4.5-6.1P6-SGE_Driver.pl**, followed by the date and hour options.

To run a single hour:

> cd $CERESHOME/inversion/CER4.5-6.1P6/rcf
> $CERESHOME/inversion/CER4.5-6.1P6/rcf/CER4.5-6.1P6-SGE_Driver.pl -date YYYYMMDD -hour HH

To run a single day:

> cd $CERESHOME/inversion/CER4.5-6.1P6/rcf
> $CERESHOME/inversion/CER4.5-6.1P6/rcf/CER4.5-6.1P6-SGE_Driver.pl –date YYYYMMDD

Note: It is not necessary to manually create the PCF as described above when using the Command Line.

There are several optional arguments for **CER4.5-6.1P6-SGE_Driver.pl**:

usage:	CER4.5-6.1P6-SGE_Driver.pl [options]
[-help]	Display this help message.
[-clean]	Delete any existing outputs that are encountered.
[-platform CPU]	Run the PGE on the platform designated by CPU (i.e., *p6* or *x86*)
[-date YYYYMMDD]	Run the PGE on the data date specified by YYYYMMDD.
[-start YYYYMMDD]	Run the PGE starting on the data date specfied by YYYYMMDD.
[-end YYYYMMDD]	Run the PGE stopping on the data date specified by YYYYMMDD.
[-hour HH]	Run the PGE for the data hour specified by HH.
[-start_hour HH]	Run the PGE for the data hours starting with HH.
[-end_hour HH]	Run the PGE for the data hours ending with HH.

4.4.1.4 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.

4.4.1.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P6.pl**, has been designed to check for these files and 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 CER4.5-6.1P6 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 4-5. 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 Table 4-1) for assistance.

Table 4-5. Exit Codes for CER4.5-6.1P6

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.1P6.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. **Report Log File: CER4.5-6.1P6_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

The Report Log File contains the Inversion 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: CER4.5-6.1P6_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.1P6_LogUser_$SS4_5_$PS4_5_$CC4_5.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.

4.5.4 Solutions to Possible Problems

As mentioned in Section 4.4.1.5, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P6.pl**, 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 Subsystem 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 744 times, maximum, in a 31 day month.

Table 4-6. Expected Output File Listing for CER4.5-6.1P6

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFB/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P3, CER5.0P3, CER9.2P3	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFA/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P3, CER5.0P3, CER9.2P3	DPO, Archive	No
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER_GQCA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCA/$SS4_5_ $PS4_5/YYYY/MM)	m	.02	1/hr	N/A	DPO, Archive, rm	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER4.5-6.1P6_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.1P6/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P6_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH.log@($CERESHOME/inversion/CER4.5-6.1P6/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P6_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.05	1/hr	N/A	Archive, rm	No
CER4.5-6.1P6_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.005	1/hr	N/A	Archive, rm	No
CER4.5-6.1P6_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.003	1/hr	N/A	Archive, rm	No
CER4.5-6.7P6_$SS4_11_$PS4_11_$CC4_11. YYYYMM.<processid>@($CERESHOME/inversion/sge_logs /CER4.5-6.1P6)	m	.003	1/hr	N/A	Archive, rm	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/)
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
hr - hour

4.7 Expected Temporary Files/Directories

Table 4-7. Temporary Files Listing for CER4.5-6.1P6

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy - $SS4_5
PS - Production Strategy - $PS4_5
CC - Configuration Code - $CC4_5

5.0 PGEName: CER4.5-6.1P7

CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor and HDF Postprocessor for NPP Processing

5.1 PGE Details

5.1.1 Responsible Persons

Table 5-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

5.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 5-1.

5.1.3 Parent PGE(s)

Table 5-2. Parent PGEs for CER4.5-6.1P7

PGEName	Description
CER4.1-4.1P7	Cloud Property Retrieval and Convolution of Imager Cloud Properties with CERES Footprint Point Spread Function
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)
CER1.4P3	CERES Geolocate and Calibrate Earth Radiances Subsystem 1.0 for TRMM, Terra, Aqua, and NPP
CER4.5-6.1P6	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget
CER4.5-6.0P6	CERES Sea Ice Brightness Index preprocessor

5.1.4 Target PGE(s)

Table 5-3. Target PGEs after CER4.5-6.1P7

PGEName	Description
CER4.5-6.2P3	Postprocessor for SSF Subset Generation
CER5.0P3	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P3	Grid TOA and Surface Fluxes

5.2 Operating Environment

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

Table 5-4. Runtime Parameters for CER4.5-6.1P7

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23
REPROCESS	Reprocessing using existing SSF data for input or Initial processing using Intermediate SSF files from Clouds processing for input.	a(3)	YES, NO
READ_IES	Input an IES file during processing or use the IES data from the SSF input data.	a(3)	YES, NO
InputArchiveInt	Sets the upper level working directory of the intermediate Clouds input data.	char	
InputArchive	Sets the upper level working directory of the MOA, SCC, IES and SSF input data.	char	

5.2.2 Environment Script Requirements

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

The following environment variables must be set:

If REPROCESS = YES
SS4_6 - Sampling Strategy for Inversion Input, see Production Request
PS4_6 - Production Strategy for Inversion Input, see Production Request
CC4_6 - Configuration Code for Inversion input, see CM Database
If REPROCESS = NO
SS4_1P6 - Sampling Strategy for Clouds (Cookiecutter), see Production Request
PS4_1 - Production Strategy for Clouds input, see Production Request
CC4_1 - Configuration Code for Clouds, see CM Database
If READ_IES=YES
SS1_0 - Sampling Strategy for Instrument, see Production Request
PS1_0 - Production Strategy for Instrument, see Production Request
CC1_0 - Configuration Code for Instrument, see CM Database

SS4_5 - Sampling Strategy for Inversion Output, see Production Request
PS4_5 - Production Strategy for Inversion Output, see Production Request
CC4_5 - Configuration Code for CER4.5-6.1P5 Output, see CM Database
SS2 - Sampling Strategy for CER2.4P1 input, see CM Database
CC2_4 - Configuration Code for CER2.4P1 input, see CM Database
PS2_4 - Production Strategy for CER2.4P1 input, see CM Database
SS12 - Sampling Strategy for RegridMOA, see Production Request
PS12 - Production Strategy for RegridMOA, see Production Request
CC12 - Configuration Code for RegridMOA, see CM Database
PS4_7 - Production Strategy (normally set to "Null") set to "DefaultSCC" when default Spectral Correction Coefficients are to be used
DATA4_5 - Historical number of unknown purpose, set to 000
DATA4_7 - Historical number of unknown purpose, set to 000
DATA4_8 - Software SCCR number
DATA4_9 - Historical number of unknown purpose, set to 000
SW4_5 - Historical number of unknown purpose, set to 000
SW4_7 - Historical number of unknown purpose, set to 000
SW4_8 - Software SCCR number
SW4_9 - Historical number of unknown purpose, set to 000
IMAG - Imager - VIIRS
INST - Instrument name – FM5
SAT - Satellite – NPP
SCCR - Software SCCR number

5.2.3 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.

5.2.4 Memory/Disk Space/Time Requirements

Memory:	296009 K
Disk Space:	679 Megabytes
Total Run Time:	4:20 minutes

5.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 5.3).

5.3 Processor Dependencies (Previous PGEs, Ingest Data)

5.3.1 Input Dataset Name (#1): SSFI

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

$InputArchiveInt/CERES/SSFI/$SS4_1P6_$PS4_1/YYYY/MM
CER_SSFI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P7

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **203**

5.3.2 Input Dataset Name (#2): SSFAI

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

$InputArchiveInt/CERES/SSFAI/$SS4_1P6_$PS4_1/YYYY/MM
CER_SSFAI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.1-4.1P7

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **26**

5.3.3 Input Dataset Name (#3): FQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchiveInt/CERES/FQCI/$SS4_1P6_$PS4_1/YYYY/MM
CER_FQCI_$SS4_1P6_$PS4_1_$CC4_1.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = NO.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

Source PGE: CER4.1-4.1P7

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**

5.3.4 Input Dataset Name (#1): SSFB

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

$InputArchive/SSFB/$SS4_6_$PS4_6/YYYY/MM
CER_SSFB_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P7

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): **189.3**

5.3.5 Input Dataset Name (#2): SSFA

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

$InputArchive/SSFA/$SS4_6_$PS4_6/YYYY/MM
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH.met

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P7

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): **26**

5.3.6 Input Dataset Name (#4): GQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GQCI/$SS4_6_$PS4_6/YYYY/MM
CER_GQCI_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory if REPROCESS = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH
3. Waiting Period: None. Process when all input data are available.

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

Source PGE: CER4.5-6.1P7

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): .10

5.3.7 Input Dataset Name (#7): IES

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

$InputArchive/IES/$SS1_$PS1/YYYY/MM
CER_IES_$SS1_0_$PS1_0_$CC1_0.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory if READ_IES = YES.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER1.4P3

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): **32.0**

5.3.8 Input Dataset Name (#4): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/MOA/$SS12_$PS12/YYYY/MM
CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH
CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH.met

or

CER_MOA_$SS12_$PS12_$CC12.H1
CER_MOA_$SS12_$PS12_$CC12.H1.met
CER_MOA_$SS12_$PS12_$CC12.H2
CER_MOA_$SS12_$PS12_$CC12.H2.met

Where **H1 and H2 are the ECMWF or DAS data dates (YYYYMMDDhh, where hh= 00, 06, 12, 18) that are closest to DataDate, YYYYMMDDHH. H1 must be 0-6 hours earlier than YYYMMDDHH and H2 must be 0-6 hours later than YYYYMMDDHH.**

1. Mandatory/Optional: **These files are Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

5.3.9 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2_4/YYYY/MM
CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.60**

5.3.10 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2_4/YYYY/MM
CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

5.3.11 Input Dataset Name (#7): MATCH-daily

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/MATCH-daily/Terra-Aqua-MODIS_Edition4/YYYY/MM/Terra-Aqua-MODIS_Edition4.YYYYMMDD.nc

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD

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

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

SARB ancillary file.

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.4**

5.3.12 Input Dataset Name (#8): sibiMap

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/sibiMap/$SS4_11_$PS4_11/YYYY/MM/CER_sibiMap_$SS4_11_$PS4_11_$CC4_11.YYYYMM

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM

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

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

Source PGE: CER4.5-6.0P6

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.2**

5.3.13 Input Dataset Name (#9): SORCE TSI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SORCE/sorce_tsi_v15.txt.yyyymmdd

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   None. The year/month/day designation relates to the last date within the file.
3. Waiting Period: **None. Process when all input data are available.**

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

SORCE TSI Climate Experiment

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

d. File Disposition after successful execution:

Do not remove.

e. Typical file size (MB): **.1**

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

The Main Processor and Postprocessor production script, **run_4.5-6.1P7.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **CER4.5-6.1P7_pcf_gen.pl**.

5.4.1 How to Execute PGE CER4.5-6.1P7 using the Command Line

5.4.1.1 How to Generate the ASCII File and PCF File

The PCF generator, **CER4.5-6.1P7_pcf_gen.pl**, creates the ASCII input file and the PCF file.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.1P7/rcf
> $CERESHOME/inversion/CER4.5-6.1P7/rcf/CER4.5-6.1P7_pcf_gen.pl
    YYYYMMDDHH
```

The following file will be generated in **$CERESHOME/inversion/CER4.5-6.1P7/rcf/pcf/**:

CER4.5-6.1P7_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

5.4.1.2 How to Execute PGE CER4.5-6.1P7

Execute the production script by typing the script name, **run_4.5-6.1P7.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 5-4.

At the command line (>) type:

>cd $CERESHOME/inversion/CER4.5-6.1P7/rcf
>$CERESHOME/inversion/CER4.5-6.1P7/rcf/run_4.5-6.1P7.pl $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

5.4.1.3 How to Execute PGE CER4.5-6.1P7 using SGE

Execute the production script by typing the script name, **CER4.5-6.1P7-SGE_Driver.pl**, followed by the date and hour options.

To run a single hour:

> cd $CERESHOME/inversion/CER4.5-6.1P7/rcf
> $CERESHOME/inversion/CER4.5-6.1P7/rcf/CER4.5-6.1P7-SGE_Driver.pl -date YYYYMMDD -hour HH

To run a single day:

> cd $CERESHOME/inversion/CER4.5-6.1P7/rcf
> $CERESHOME/inversion/CER4.5-6.1P7/rcf/CER4.5-6.1P7-SGE_Driver.pl –date YYYYMMDD

Note: It is not necessary to manually create the PCF as described above when using the Command Line.

There are several optional arguments for **CER4.5-6.1P7-SGE_Driver.pl**:

usage:	CER4.5-6.1P7-SGE_Driver.pl [options]
[-help]	Display this help message.
[-clean]	Delete any existing outputs that are encountered.
[-platform CPU]	Run the PGE on the platform designated by CPU (i.e., *p6* or *x86*)
[-date YYYYMMDD]	Run the PGE on the data date specified by YYYYMMDD.
[-start YYYYMMDD]	Run the PGE starting on the data date specfied by YYYYMMDD.
[-end YYYYMMDD]	Run the PGE stopping on the data date specified by YYYYMMDD.
[-hour HH]	Run the PGE for the data hour specified by HH.
[-start_hour HH]	Run the PGE for the data hours starting with HH.
[-end_hour HH]	Run the PGE for the data hours ending with HH.

5.4.1.4 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.

5.4.1.5 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P7.pl**, has been designed to check for these files and 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 CER4.5-6.1P7 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 5-5. 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 Table 5-1) for assistance.

Table 5-5. Exit Codes for CER4.5-6.1P7

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
202	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.1P7.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. Report Log File: CER4.5-6.1P7_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion 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: CER4.5-6.1P7_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.1P7_LogUser_$SS4_5_$PS4_5_$CC4_5.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.

5.5.4 Solutions to Possible Problems

As mentioned in Section 5.4.1.5, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.1P7.pl**, 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 Subsystem 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 744 times, maximum, in a 31 day month.

Table 5-6. Expected Output File Listing for CER4.5-6.1P7

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFB/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P3, CER5.0P3, CER9.2P3	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFA/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P3, CER5.0P3, CER9.2P3	DPO, Archive	No
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER_GQCA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCA/$SS4_5_ $PS4_5/YYYY/MM)	m	.02	1/hr	N/A	DPO, Archive, rm	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER4.5-6.1P7_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.1P7/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No

Table 5-6. Expected Output File Listing for CER4.5-6.1P7

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER4.5-6.1P7_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH.log@($CERESHOME/inversion/CER4.5-6.1P7/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.1P7_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.05	1/hr	N/A	Archive, rm	No
CER4.5-6.1P7_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.005	1/hr	N/A	Archive, rm	No
CER4.5-6.1P7_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.003	1/hr	N/A	Archive, rm	No
CER4.5-6.1P7_$SS4_11_$PS4_11_$CC4_11.YYYYMM.<processid>@($CERESHOME/inversion/sge_logs/CER4.5-6.1P7)	m	.003	1/hr	N/A	Archive, rm	No

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/)
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
hr - hour

5.7 Expected Temporary Files/Directories

Table 5-7. Temporary Files Listing for CER4.5-6.1P7

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy - $SS4_5
PS - Production Strategy - $PS4_5
CC - Configuration Code - $CC4_5

6.0 PGEName: CER4.5-6.2P2

CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Processing Edition2

6.1 PGE Details

6.1.1 Responsible Persons

Table 6-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

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 CER4.5-6.2P2

PGEName	Description
CER4.5-6.1P2 or CER4.5-6.1P3	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main or Alternate Processor and HDF Postprocessor for Terra and Aqua processing

6.1.4 Target PGE(s)

Table 6-3. Target PGEs after CER4.5-6.2P2

PGEName	Description
CER4.5-6.4P1	Monthly Validation Site SSF Processor for Terra and Aqua

6.2 Operating Environment

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

Table 6-4. Runtime Parameters for CER4.5-6.2P2

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31

6.2.2 Environment Script Requirements

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

The following Parameters are required:

SS4_5 - Sampling Strategy for Inversion, see Production Request
PS4_5 - Production Strategy for Inversion, see Production Request
CC4_5 - Input Configuration Code for PGE CER4.5-6.2P2, see CM Database
CC4_9 - Output Configuration Code for PGE CER4.5-6.2P2, see CM Database

6.2.3 Execution Frequency (daily, hourly, or monthly)

daily (1/day) - This PGE is to be processed once per data-day, a maximum total of 31 days per month, when input is available.

6.2.4 Memory/Disk Space/Time Requirements

Memory: 36688 K
Disk Space: 5500 Megabytes
Total Run Time: 50 minutes

6.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 6.3).

6.3 Processor Dependencies (Previous PGEs, Ingest Data)

6.3.1 Input Dataset Name (#1): SSFB

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

$CERESHOME/inversion/data/SSFB/$SS4_5_$PS4_5/YYYY/MM/CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P2 or CER4.5-6.1P3

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **205**

6.3.2 Input Dataset Name (#2): SSFA

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

$CERESHOME/inversion/data/SSFA/$SS4_5_$PS4_5/YYYY/MM/CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P2 or CER4.5-6.1P3

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **26**

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

The Postprocessor production script, **run_4.5-6.2P2.pl**, references a PCF which contains the correct file names and paths for PGE, **CER4.5-6.2P2**. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.2P2.pl**.

6.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.2P2.pl**, requires one command line argument, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 6-4.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.2P2/rcf
> source $CERESHOME/inversion/CER4.5-6.2P2/rcf/ENVinversion_subset-env.csh
> $CERESHOME/inversion/CER4.5-6.2P2/rcf/pcfgen_4.5-6.2P2.pl -date YYYYMMDD

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.2P2/rcf/pcf/**:

CER4.5-6.2P2_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

6.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_4.5-6.2P2.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date". The date parameter is formatted, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 6-4.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.2P2/rcf
> $CERESHOME/inversion/CER4.5-6.2P2/rcf/run_4.5-6.2P2.pl $SS4_5_$PS4_5_$CC4_9.YYYYMMDD

6.4.3 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.

6.4.4 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P2.pl**, 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.

6.5 Execution Evaluation

6.5.1 Exit Codes

The processor CER4.5-6.2P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 6-5. 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 for assistance (see Table 6-1).

Table 6-5. Exit Codes for CER4.5-6.2P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.2P2.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output file that does not exist. This does not signify a problem.

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

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

1. Report Log File: CER4.5-6.2P2_LogReport_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

The Report Log File contains the Inversion 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: CER4.5-6.2P2_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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: CER4.5-6.2P2_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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.

6.5.4 Solutions to Possible Problems

As mentioned in Section 6.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P2.pl**, 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.

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

a. Subsystem Termination

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

b. Target PGE Termination - N/A

6.6 Expected Output Dataset(s)

The expected Output Datasets are listed below for each instance of the PGE. This PGE is expected to process 31 times, maximum, in a 31 day month.

Table 6-6. Expected Output File Listing for CER4.5-6.2P2

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFS-DAY/ $SS4_5_$PS4_5/YYYY/MM/)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFS-NIT_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFS-NIT/ $SS4_5_$PS4_5/YYYY/MM/)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFAS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFAS-DAY/ $SS4_5_$PS4_5/YYYY/MM/)	m	100	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/SSFB-nadir/$SS4_5_ $PS4_5/YYYY/MM/)	o	14	1/day	N/A	DPO, Archive, rm	No
CER_SSF-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/SSF-nadir/ $SS4_5_$PS4_5/YYYY/MM/)	o	7	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD(.met) @($CERESHOME/inversion/data/SSFB-val/$SS4_5_$PS4_5 /YYYY/MM/)	m	21	1/day	CER4.5-6.4P1	DPO, Archive	No
CER_SSFA-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD(.met) @($CERESHOME/inversion/data/SSFA-val/$SS4_5_$PS4_5 /YYYY/MM/)	m	2	1/day	CER4.5-6.4P1	DPO, Archive	No
CER4.5-6.2P2_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD @($CERESHOME/inversion/CER4.5-6.2P2/rcf/pcf)	m	.01	1/day	N/A	Archive, rm	No
CER4.5-6.2P2_LogReport_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.015	1/day	N/A	Archive, rm	No
CER4.5-6.2P2_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.008	1/day	N/A	Archive, rm	No
CER4.5-6.2P2_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.001	1/day	N/A	Archive, rm	No

a. See Section 6.2 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. 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
hr - hour

c. Nadir files are not created for FM4 NoSW production strategies.

6.7 Expected Temporary Files/Directories

Table 6-7. Temporary Files Listing for CER4.5-6.2P2

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDD
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDD

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
DD - 2-digit day {valid values: 01 .. 31}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_9

7.0 PGEName: CER4.5-6.2P3

CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Processing for Edition4 and NPP Edition1

7.1 PGE Details

7.1.1 Responsible Persons

Table 7-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

7.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 7-1.

7.1.3 Parent PGE(s)

Table 7-2. Parent PGEs for CER4.5-6.2P3

PGEName	Description
CER4.5-6.1P4 or CER4.5-6.1P5 or CER4.5-6.1P6 or CER4.5-6.1P7	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor for Terra and Aqua Edition4 processing

7.1.4 Target PGE(s)

Table 7-3. Target PGEs after CER4.5-6.2P3

PGEName	Description
CER4.5-6.4P2	Monthly Validation Site SSF Processor for Terra and Aqua for Edition4 and NPP Edition1

7.2 Operating Environment

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

Table 7-4. Runtime Parameters for CER4.5-6.2P3

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31

7.2.2 Environment Script Requirements

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

The following Parameters are required:

SS4_5 - Sampling Strategy for Inversion, see Production Request
PS4_5 - Production Strategy for Inversion, see Production Request
CC4_5 - Input Config. Code for PGE CER4.5-6.2P3, see CM Database
CC4_9 - Output Config. Code for PGE CER4.5-6.2P3, see CM Database
DATA4_5 - Historical number of unknown purpose, set to 000
DATA4_7 - Historical number of unknown purpose, set to 000
DATA4_8 - Software SCCR number
DATA4_9 - Historical number of unknown purpose, set to 000
SW4_5 - Historical number of unknown purpose, set to 000
SW4_7 - Historical number of unknown purpose, set to 000
SW4_8 - Software SCCR number
SW4_9 - Historical number of unknown purpose, set to 000
IMAG - Imager name
INST - Instrument name
SAT - Satellite name
SCCR - Software SCCR number

PROD	-	Production processing (YES/NO) used to set input file directories
InputArchiveInt	-	Intermediate files directory, not used within this PGE
MATCHArchive	-	MATCH files directory, not used within this PGE

7.2.3 Execution Frequency (daily, hourly, or monthly)

daily (1/day) - This PGE is to be processed once per data-day, a maximum total of 31 days per month, when input is available.

7.2.4 Memory/Disk Space/Time Requirements

Memory:	36688 K
Disk Space:	5500 Megabytes
Total Run Time:	50 minutes

7.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 7.3).

7.3 Processor Dependencies (Previous PGEs, Ingest Data)

7.3.1 Input Dataset Name (#1): SSFB

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

   $CERESHOME/inversion/data/SSFB/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

   1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.1P6 or CER4.5-6.1P7

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **205**

7.3.2 Input Dataset Name (#2): SSFA

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

   $CERESHOME/inversion/data/SSFA/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P4, CER4.5-6.1P5, CER4.5-6.1P6 or CER4.5-6.1P7

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **26**

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

The Postprocessor production script, **run_4.5-6.2P3.csh**, references a PCF which contains the correct file names and paths for PGE, **CER4.5-6.2P3**. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.2P3.csh**.

7.4.1 How to Execute PGE CER4.5-6.2P3 using the Command Line

7.4.1.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.2P3.csh**, requires one command line argument, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 7-4.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.2P3/rcf
> source $CERESHOME/inversion/CER4.5-6.2P3/rcf/ENVinversion_subset-env.csh
> $CERESHOME/inversion/CER4.5-6.2P3/rcf/pcfgen_4.5-6.2P3.csh YYYYMMDD
```

The following file will be generated in **$CERESHOME/inversion/CER4.5-6.2P3/rcf/pcf/**:

CER4.5-6.2P3_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

7.4.1.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_4.5-6.2P3.csh**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date". The date parameter is formatted, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 7-4.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.2P3/rcf
> $CERESHOME/inversion/CER4.5-6.2P3/rcf/run_4.5-6.2P3.csh $SS4_5_$PS4_5_$CC4_9.YYYYMMDD

7.4.2 How to Execute PGE CER4.5-6.2P3 using SGE

Execute the production script by typing the script name, **CER4.5-6.2P3-SGE_Driver.pl**, followed by the date options.

To run a single day:

> cd $CERESHOME/inversion/CER4.5-6.2P3/rcf
> $CERESHOME/inversion/CER4.5-6.2P3/rcf/CER4.5-6.2P3-SGE_Driver.pl -date YYYYMMDD

To run a series of days:

> cd $CERESHOME/inversion/CER4.5-6.2P3/rcf
> $CERESHOME/inversion/CER4.5-6.2P3/rcf/CER4.5-6.2P3-SGE_Driver.pl -start YYYYMMDD -end YYYYMMDD

Note: It is not necessary to manually create the PCF as described above when using the Command Line.

There are several optional arguments for **CER4.5-6.2P3-SGE_Driver.pl**:

usage:	CER4.5-6.2P3-SGE_Driver.pl [options]
[-help]	Display this help message.
[-clean]	Delete any existing outputs that are encountered.
[-platform CPU]	Run the PGE on the platform designated by CPU (i.e. p6 or x86)
[-date YYYYMMDD]	Run the PGE on the data date specified by YYYYMMDD.
[-start YYYYMMDD]	Run the PGE starting on the data date specfied by YYYYMMDD.
[-end YYYYMMDD]	Run the PGE stopping on the data date specified by YYYYMMDD.

7.4.3 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.

7.4.4 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P3.csh**, 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 CER4.5-6.2P3 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 7-5. 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 for assistance (see Table 7-1).

Table 7-5. Exit Codes for CER4.5-6.2P3

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.2P3.csh**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output 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 any error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/runlogs**.

1. Report Log File: CER4.5-6.2P3_LogReport_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

The Report Log File contains the Inversion 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: CER4.5-6.2P3_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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: CER4.5-6.2P3_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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

As mentioned in Section 7.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P3.csh**, 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 Subsystem terminating conditions at this time. If one day fails, continue processing the next day.

b. Target PGE Termination - N/A

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 31 times, maximum, in a 31 day month.

Table 7-6. Expected Output File Listing for CER4.5-6.2P3

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFS-DAY/$SS4_5_ $PS4_5/YYYY/MM/)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFS-NIT_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/ SSFS-NIT/$SS4_5_$PS4_5/YYYY/MM/)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFAS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/ SSFAS-DAY/$SS4_5_$PS4_5/YYYY/MM/)	m	100	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/ SSFB-nadir/$SS4_5_$PS4_5/YYYY/MM/)	o	14	1/day	N/A	DPO, Archive, rm	No
CER_SSF-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/ SSF-nadir/$SS4_5_$PS4_5/YYYY/MM/)	o	7	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/ SSFB-val/$SS4_5_$PS4_5/YYYY/MM/)	m	21	1/day	CER4.5-6.4P2	DPO, Archive	No
CER_SSFA-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/ SSFA-val/$SS4_5_$PS4_5/YYYY/MM/)	m	2	1/day	CER4.5-6.4P2	DPO, Archive	No
CER4.5-6.2P3_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD @($CERESHOME/inversion/CER4.5-6.2P3/rcf/pcf/)	m	.01	1/day	N/A	Archive, rm	No
CER4.5-6.2P3_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMM DD.log@($CERESHOME/inversion/CER4.5-6.2P3/rcf/pcf/)	m	.01	1/day	N/A	Archive, rm	No
CER4.5-6.2P3_LogReport_$SS4_5_$PS4_5_$CC4_9. YYYYMMDD@($CERESHOME/inversion/runlogs/)	m	.015	1/day	N/A	Archive, rm	No
CER4.5-6.2P3_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.008	1/day	N/A	Archive, rm	No
CER4.5-6.2P3_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs/)	m	.001	1/day	N/A	Archive, rm	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. 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
hr - hour

c. Nadir files are not created for FM4 NoSW production strategies.

7.7 Expected Temporary Files/Directories

Table 7-7. Temporary Files Listing for CER4.5-6.2P3

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDD
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDD

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
DD - 2-digit day {valid values: 01 .. 31}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_9

8.0 PGEName: CER4.5-6.2P4

CERES Subsystems 4.5 and 4.6 SSF Subset Postprocessor for Terra and Aqua Processing for Edition3

8.1 PGE Details

8.1.1 Responsible Persons

Table 8-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

8.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 8-1.

8.1.3 Parent PGE(s)

Table 8-2. Parent PGEs for CER4.5-6.2P4

PGEName	Description
CER4.5-6.5P4 or CER4.5-6.5P5	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget Subsystems 4.5 and 4.6 Main Processor for Terra and Aqua Edition3 processing

8.1.4 Target PGE(s)

Table 8-3. Target PGEs after CER4.5-6.2P4

PGEName	Description
CER4.5-6.4P1	Monthly Validation Site SSF Processor for Terra and Aqua

8.2 Operating Environment

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

Table 8-4. Runtime Parameters for CER4.5-6.2P4

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31

8.2.2 Environment Script Requirements

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

The following Parameters are required:

SS4_5 - Sampling Strategy for Inversion, see Production Request
PS4_5 - Production Strategy for Inversion, see Production Request
CC4_5 - Input Configuration Code for PGE CER4.5-6.2P4, see CM Database
CC4_9 - Output Configuration Code for PGE CER4.5-6.2P4, see CM Database

8.2.3 Execution Frequency (daily, hourly, or monthly)

daily (1/day) - This PGE is to be processed once per data-day, a maximum total of 31 days per month, when input is available.

8.2.4 Memory/Disk Space/Time Requirements

Memory: 36688 K
Disk Space: 5500 Megabytes
Total Run Time: 50 minutes

8.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 8.3).

8.3 Processor Dependencies (Previous PGEs, Ingest Data)

8.3.1 Input Dataset Name (#1): SSFB

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

$CERESHOME/inversion/data/SSFB/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.5P4 or CER4.5-6.5P5

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **205**

8.3.2 Input Dataset Name (#2): SSFA

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

$CERESHOME/inversion/data/SSFA/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.5P4 or CER4.5-6.5P5

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **26**

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

The Postprocessor production script, **run_4.5-6.2P4.pl**, references a PCF which contains the correct file names and paths for PGE, **CER4.5-6.2P4**. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.2P4.pl**.

8.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.2P4.pl**, requires one command line argument, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 8-4.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.2P4/rcf
> source $CERESHOME/inversion/CER4.5-6.2P4/rcf/ENVinversion_subset-env.csh
> $CERESHOME/inversion/CER4.5-6.2P4/rcf/pcfgen_4.5-6.2P4.pl  -date
    YYYYMMDD
```

The following file will be generated in **$CERESHOME/inversion/CER4.5-6.2P4/rcf/pcf/**:

CER4.5-6.2P4_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

8.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_4.5-6.2P4.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date". The date parameter is formatted, YYYYMMDD, where YYYY is the data year, MM is the data month, and DD is the data day, see Table 8-4.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.2P4/rcf
> $CERESHOME/inversion/CER4.5-6.2P4/rcf/run_4.5-6.2P4.pl
      $SS4_5_$PS4_5_$CC4_9.YYYYMMDD
```

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P4.pl**, 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 CER4.5-6.2P4 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 8-5. 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 for assistance (see Table 8-1).

Table 8-5. Exit Codes for CER4.5-6.2P4

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.2P4.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output 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 any error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/runlogs**.

1. Report Log File: CER4.5-6.2P4_LogReport_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

The Report Log File contains the Inversion 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: CER4.5-6.2P4_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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: CER4.5-6.2P4_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD

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

As mentioned in Section 8.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.2P4.pl**, 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 Subsystem terminating conditions at this time. If one day fails, continue processing the next day.

b. Target PGE Termination - N/A

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 31 times, maximum, in a 31 day month.

Table 8-6. Expected Output File Listing for CER4.5-6.2P4

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFS-DAY/$SS4_5_$PS4_5/YYYY/MM)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFS-NIT_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD(.met) @($CERESHOME/inversion/data/SSFS-NIT/$SS4_5_$PS4_5/YYYY/MM)	m	500	1/day	N/A	DPO, Archive, rm	No
CER_SSFAS-DAY_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)@($CERESHOME/inversion/data/SSFAS-DAY/$SS4_5_$PS4_5/YYYY/MM)	m	100	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/SSFB-nadir/$SS4_5_$PS4_5/YYYY/MM)	o	14	1/day	N/A	DPO, Archive, rm	No
CER_SSF-nadir_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (.met)[c]@($CERESHOME/inversion/data/SSF-nadir/$SS4_5_$PS4_5/YYYY/MM)	o	7	1/day	N/A	DPO, Archive, rm	No
CER_SSFB-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD(.met) @($CERESHOME/inversion/data/SSFB-val/$SS4_5_$PS4_5/YYYY/MM)	m	21	1/day	CER4.5-6.4P2	DPO, Archive	No
CER_SSFA-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD(.met) @($CERESHOME/inversion/data/SSFA-val/$SS4_5_$PS4_5/YYYY/MM)	m	2	1/day	CER4.5-6.4P2	DPO, Archive	No
CER4.5-6.2P4_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD @($CERESHOME/inversion/CER4.5-6.2P4/rcf/pcf)	m	.01	1/day	N/A	Archive, rm	No
CER4.5-6.2P4_PCF_$SS4_5_$PS4_5_$CC4_9.YYYYMM DD.log@($CERESHOME/inversion/CER4.5-6.2P4/rcf/pcf)	m	.01	1/day	N/A	Archive, rm	No
CER4.5-6.2P4_LogReport_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.015	1/day	N/A	Archive, rm	No
CER4.5-6.2P4_LogStatus_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.008	1/day	N/A	Archive, rm	No
CER4.5-6.2P4_LogUser_$SS4_5_$PS4_5_$CC4_9.YYYY MMDD@($CERESHOME/inversion/runlogs)	m	.001	1/day	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. 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
hr - hour

c. Nadir files are not created for FM4 NoSW production strategies.

8.7 Expected Temporary Files/Directories

Table 8-7. Temporary Files Listing for CER4.5-6.2P4

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDD
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDD

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
DD - 2-digit day {valid values: 01 .. 31}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_9

9.0 PGEName: CER4.5-6.4P1

CERES Subsystems 4.5 and 4.6 Monthly Validation Site SSF Processor for Terra

9.1 PGE Details

9.1.1 Responsible Persons

Table 9-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

9.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 9-1.

9.1.3 Parent PGE(s)

Table 9-2. Parent PGEs for CER4.5-6.4P1

PGEName	Description
CER4.5-6.2P2 or CER4.5-6.2P4	CERES subsetting post processor.

9.1.4 Target PGE(s):

N/A

9.2 Operating Environment

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

Table 9-3. Runtime Parameters for CER4.5-6.4P1

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	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.

The following Parameters are required:

SS4_5 - Sampling Strategy for Inversion, see Production Request
PS4_5 - Production Strategy for Inversion, see Production Request
CC4_5 - Configuration Code for PGE CER4.5-6.1P2, see CM Database
CC4_9 - Configuration Code for PGE CER4.5-6.2P2, see CM Database
CC4_10 - Configuration Code for PGE CER4.5-6.4P1, see CM Database

9.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is to be processed once per data-month.

9.2.4 Memory/Disk Space/Time Requirements

Memory: 3654 K
Disk Space: 1150 Megabytes
Total Run Time: 8 minutes

9.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 9.3).

9.3 Processor Dependencies (Previous PGEs, Ingest Data)

9.3.1 Input Dataset Name (#1): SSFB-val

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

$CERESHOME/inversion/data/SSFB-val/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFB-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (DD = 00 .. 31)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD

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

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

   Source PGE: CER4.5-6.2P2, CER4.5-6.2P4

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **35**

9.3.2 Input Dataset Name (#2): SSFA-val

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

   $CERESHOME/inversion/data/SSFA-val/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFA-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (DD = 00 .. 31)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD

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

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

   Source PGE: CER4.5-6.2P2, CER4.5-6.2P4

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **4.5**

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

The Postprocessor production script, **run_4.5-6.4P1.pl**, references a PCF which contains the correct file names and paths for PGE, **CER4.5-6.4P1**. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.4P1.pl**.

9.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.4P1.pl**, requires one command line argument, YYYYMM, where YYYY is the data year, and MM is the data month, see Table 9-3.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.4P1/rcf
> source $CERESHOME/inversion/CER4.5-6.4P1/rcf/ENVinversion_subset-env.csh
> $CERESHOME/inversion/CER4.5-6.4P1/rcf/pcfgen_4.5-6.4P1.pl -date YYYYMM

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.4P1/rcf/pcf/**:

CER4.5-6.4P1_PCFin_$SS4_5_$PS4_5_$CC4_10.YYYYMM
CER4.5-6.4P1_PCF_$SS4_5_$PS4_5_$CC4_10.YYYYMM

9.4.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_4.5-6.4P1.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date". The date parameter is formatted, YYYYMM, where YYYY is the data year, and MM is the data month, see Table 9-3.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.4P1/rcf
> $CERESHOME/inversion/CER4.5-6.4P1/rcf/run_4.5-6.4P1.pl
$SS4_5_$PS4_5_$CC4_10.YYYYMM

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.4P1.pl**, 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 Execution Evaluation

9.5.1 Exit Codes

The processor CER4.5-6.4P1 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 9-4. 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 for assistance (see Table 9-1).

Table 9-4. Exit Codes for CER4.5-6.4P1

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.4P1.pl**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output 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 any error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/runlogs**.

1. Report Log File: CER4.5-6.4P1_LogReport_$SS4_5_$PS4_5_$CC4_10.YYYYMM

The Report Log File contains the Inversion 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: CER4.5-6.4P1_LogStatus_$SS4_5_$PS4_5_$CC4_10.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: CER4.5-6.4P1_LogUser_$SS4_5_$PS4_5_$CC4_10.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 9.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.4P1.pl**, 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 Subsystem terminating conditions at this time. If one day fails, continue processing the next day.

b. Target PGE Termination - N/A

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 31 times, maximum, in a 31 day month.

Table 9-5. Expected Output File Listing for CER4.5-6.4P1

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB-valmm_$SS4_5_$PS4_5_$CC4_10.YYYYMM (.met)@($CERESHOME/inversion/data/SSFB-valmm/$SS4_5_$PS4_5/YYYY/MM)	m	1100	1/month	N/A	DPO, Archive, rm	No
CER_SSFA-valmm_$SS4_5_$PS4_5_$CC4_10.YYYYMM (.met)@($CERESHOME/inversion/data/SSFA-valmm/$SS4_5_$PS4_5/YYYY/MM)	m	135	1/month	N/A	DPO, Archive, rm	No
CER_GQCA-val_$SS4_5_$PS4_5_$CC4_10.YYYYMM(.met) @($CERESHOME/inversion/data/GQCA-val/$SS4_5_$PS4_5/YYYY/MM)	m	.02	1/month	N/A	DPO, Archive, rm	No
CER4.5-6.4P1_PCF_$SS4_5_$PS4_5_$CC4_10.YYYYMM @($CERESHOME/inversion/CER4.5-6.4P1/rcf/pcf)	m	.01	1/month	N/A	Archive, rm	No
CER4.5-6.4P1_PCF_$SS4_5_$PS4_5_$CC4_10.YYYY MM.log@($CERESHOME/inversion/CER4.5-6.4P1/rcf/pcf)	m	.01	1/month	N/A	Archive, rm	No
CER4.5-6.4P1_LogReport_$SS4_5_$PS4_5_$CC4_10. YYYYMM@($CERESHOME/inversion/runlogs)	m	.015	1/month	N/A	Archive, rm	No
CER4.5-6.4P1_LogStatus_$SS4_5_$PS4_5_$CC4_10. YYYYMM@($CERESHOME/inversion/runlogs)	m	.008	1/month	N/A	Archive, rm	No
CER4.5-6.4P1_LogUser_$SS4_5_$PS4_5_$CC4_10. YYYYMM@($CERESHOME/inversion/runlogs)	m	.001	1/month	N/A	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. 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
hr - hour

9.7 Expected Temporary Files/Directories

Table 9-6. Temporary Files Listing for CER4.5-6.4P1

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMM
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMM

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
DD - 2-digit day {valid values: 01 .. 31}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_10

10.0 PGEName: CER4.5-6.4P2

CERES Subsystems 4.5 and 4.6 Monthly Validation Site SSF Processor for Terra and Aqua for Edition4 and NPP Edition1

10.1 PGE Details

10.1.1 Responsible Persons

Table 10-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

10.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 10-1.

10.1.3 Parent PGE(s)

Table 10-2. Parent PGEs for CER4.5-6.4P2

PGEName	Description
CER4.5-6.2P3	CERES subsetting post processor.

10.1.4 Target PGE(s):

N/A

10.2 Operating Environment

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

Table 10-3. Runtime Parameters for CER4.5-6.4P2

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	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.

The following Parameters are required:

SS4_5 - Sampling Strategy for Inversion, see Production Request
PS4_5 - Production Strategy for Inversion, see Production Request
CC4_5 - Configuration Code for PGE CER4.5-6.1P4/5, see CM Database
CC4_9 - Configuration Code for PGE CER4.5-6.2P3, see CM Database
CC4_10 - Configuration Code for PGE CER4.5-6.4P2, see CM Database
DATA4_5 - Historical number of unknown purpose, set to 000
DATA4_7 - Historical number of unknown purpose, set to 000
DATA4_8 - Software SCCR number
DATA4_9 - Historical number of unknown purpose, set to 000
SW4_5 - Historical number of unknown purpose, set to 000
SW4_7 - Historical number of unknown purpose, set to 000
SW4_8 - Software SCCR number
SW4_9 - Historical number of unknown purpose, set to 000
IMAG - Imager name
INST - Instrument name
SAT - Satellite name
SCCR - Software SCCR number
PROD - Production processing (YES/NO) used to set input file directories
InputArchiveInt - Intermediate files directory, not used within this PGE
MATCHArchive - MATCH files directory, not used within this PGE

10.2.3 Execution Frequency (daily, hourly, or monthly)

monthly (1/month) - This PGE is to be processed once per data-month.

10.2.4 Memory/Disk Space/Time Requirements

Memory:	3654 K
Disk Space:	1150 Megabytes
Total Run Time:	8 minutes

10.2.5 Restrictions Imposed in Processing Order

None. Process when Input Data are available (see Section 10.3).

10.3 Processor Dependencies (Previous PGEs, Ingest Data)

10.3.1 Input Dataset Name (#1): SSFB-val

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

$CERESHOME/inversion/data/SSFB-val/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFB-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (DD = 00 .. 31)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER4.5-6.2P3

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

d. File Disposition after successful execution:

Remove.

e. Typical file size (MB): **35**

10.3.2 Input Dataset Name (#2): SSFA-val

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

$CERESHOME/inversion/data/SSFA-val/$SS4_5_$PS4_5/YYYY/MM/ CER_SSFA-val_$SS4_5_$PS4_5_$CC4_9.YYYYMMDD (DD = 00 .. 31)

1. Mandatory/Optional: **These files are optional if they do not exist, but at least one hour must exist.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD
3. Waiting Period: None. Process when all input data are available.

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

   Source PGE: CER4.5-6.2P3

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

d. File Disposition after successful execution:

   Remove.

e. Typical file size (MB): **4.5**

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

The Postprocessor production script, **run_4.5-6.4P2.csh**, references a PCF which contains the correct file names and paths for PGE, **CER4.5-6.4P2**. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.4P2.csh**.

10.4.1 How to Execute PGE CER4.5-6.4P2 using the Command Line

10.4.1.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.4P2.csh**, requires one command line argument, YYYYMM, where YYYY is the data year, and MM is the data month, see Table 10-3.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.4P2/rcf
> source $CERESHOME/inversion/CER4.5-6.4P2/rcf/ENVinversion_subset-env.csh
> $CERESHOME/inversion/CER4.5-6.4P2/rcf/pcfgen_4.5-6.4P2.csh YYYYMM
```

The following file will be generated in **$CERESHOME/inversion/CER4.5-6.4P2/rcf/pcf/**:

CER4.5-6.4P2_PCF_$SS4_5_$PS4_5_$CC4_10.YYYYMM

10.4.1.2 How to Execute the Main Processor

Execute the production script by typing the script name, **run_4.5-6.4P2.csh**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."Data Date". The date parameter is formatted, YYYYMM, where YYYY is the data year, and MM is the data month, see Table 10-3.

At the command line (>) type:

```
> cd $CERESHOME/inversion/CER4.5-6.4P2/rcf
> $CERESHOME/inversion/CER4.5-6.4P2/rcf/run_4.5-6.4P2.csh
      $SS4_5_$PS4_5_$CC4_10.YYYYMM
```

10.4.2 How to Execute PGE CER4.5-6.4P2 using SGE

Execute the production script by typing the script name, **CER4.5-6.4P2-SGE_Driver.pl**, followed by the date options.

To run a single month:

> cd $CERESHOME/inversion/CER4.5-6.4P2/rcf
> $CERESHOME/inversion/CER4.5-6.4P2/rcf/CER4.5-6.4P2-SGE_Driver.pl -date YYYYMM

To run a series of months:

> cd $CERESHOME/inversion/CER4.5-6.4P2/rcf
> $CERESHOME/inversion/CER4.5-6.4P2/rcf/CER4.5-6.4P2-SGE_Driver.pl -start YYYYMM -end YYYYMM

Note: It is not necessary to manually create the PCF as described above when using the Command Line.

There are several optional arguments for **CER4.5-6.24P2-SGE_Driver.pl**:

usage:	CER4.5-6.4P2-SGE_Driver.pl [options]
[-help]	Display this help message.
[-clean]	Delete any existing outputs that are encountered.
[-platform CPU]	Run the PGE on the platform designated by CPU (i.e. p6 or x86)
[-date YYYYMMDD]	Run the PGE on the data date specified by YYYYMMDD.
[-start YYYYMMDD]	Run the PGE starting on the data date specfied by YYYYMMDD.
[-end YYYYMMDD]	Run the PGE stopping on the data date specified by YYYYMMDD.

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.4P2.csh**, 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 Execution Evaluation

10.5.1 Exit Codes

The processor CER4.5-6.4P2 terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 10-4. 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 for assistance (see Table 10-1).

Table 10-4. Exit Codes for CER4.5-6.4P2

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.4P2.csh**, the system message, "No match," may be written to the screen. This message occurs when the scripts try to remove an old output 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 any error and/or status messages produced by the PGE. The files are located in directory: **$CERESHOME/inversion/runlogs**.

1. Report Log File: CER4.5-6.4P2_LogReport_$SS4_5_$PS4_5_$CC4_10.YYYYMM

The Report Log File contains the Inversion 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: CER4.5-6.4P2_LogStatus_$SS4_5_$PS4_5_$CC4_10.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: CER4.5-6.4P2_LogUser_$SS4_5_$PS4_5_$CC4_10.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 10.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.4P2.csh**, 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 Subsystem terminating conditions at this time. If one day fails, continue processing the next day.

b. Target PGE Termination - N/A

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 31 times, maximum, in a 31 day month.

Table 10-5. Expected Output File Listing for CER4.5-6.4P2

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB-valmm_$SS4_5_$PS4_5_$CC4_10.YYYYMM (.met)@($CERESHOME/inversion/data/ SSFB-valmm/$SS4_5_$PS4_5/YYYY/MM/)	m	1100	1/month	N/A	DPO, Archive, rm	No
CER_SSFA-valmm_$SS4_5_$PS4_5_$CC4_10.YYYYMM (.met)@($CERESHOME/inversion/data/ SSFA-valmm/$SS4_5_$PS4_5/YYYY/MM/)	m	135	1/month	N/A	DPO, Archive, rm	No
CER_GQCA-val_$SS4_5_$PS4_5_$CC4_10.YYYYMM(.met) @($CERESHOME/inversion/data/ GQCA-val/$SS4_5_$PS4_5/YYYY/MM/)	m	.02	1/month	N/A	DPO, Archive, rm	No
CER4.5-6.4P2_PCF_$SS4_5_$PS4_5_$CC4_10.YYYYMM @($CERESHOME/inversion/CER4.5-6.4P2/rcf/pcf/)	m	.01	1/month	N/A	Archive, rm	No
CER4.5-6.4P2_PCF_$SS4_5_$PS4_5_$CC4_10.YYYYMM.log @($CERESHOME/inversion/CER4.5-6.4P2/rcf/pcf/)	m	.01	1/month	N/A	Archive, rm	No
CER4.5-6.4P2_LogReport_$SS4_5_$PS4_5_$CC4_10. YYYYMM@($CERESHOME/inversion/runlogs/)	m	.015	1/month	N/A	Archive, rm	No
CER4.5-6.4P2_LogStatus_$SS4_5_$PS4_5_$CC4_10. YYYYMM@($CERESHOME/inversion/runlogs/)	m	.008	1/month	N/A	Archive, rm	No
CER4.5-6.4P2_LogUser_$SS4_5_$PS4_5_$CC4_10.YYYYMM @($CERESHOME/inversion/runlogs/)	m	.001	1/month	N/A	Archive, rm	No

a. See Section 10.2.2 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. 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
hr - hour

10.7 Expected Temporary Files/Directories

Table 10-6. Temporary Files Listing for CER4.5-6.4P2

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMM
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMM

a. YYYY - 4-digit year
MM - 2-digit month {valid values: 01 .. 12}
DD - 2-digit day {valid values: 01 .. 31}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_10

11.0 PGEName: CER4.5-6.5P4

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 for Terra using Instrument Scan (IES) data.

11.1 PGE Details

11.1.1 Responsible Persons

Table 11-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

11.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 11-1.

11.1.3 Parent PGE(s)

Table 11-2. Parent PGEs for CER4.5-6.5P4

PGEName	Description
CER4.5-6.1P2	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget for Terra
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)
CER1.4P3	CERES Geolocate and Calibrate Earth Radiances for Terra
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients

11.1.4 Target PGE(s)

Table 11-3. Target PGEs after CER4.5-6.5P4

PGEName	Description
CER4.5-6.2P4	Postprocessor for SSF Subset Generation
CER5.0P2	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P2	Grid TOA and Surface Fluxes

11.2 Operating Environment

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

Table 11-4. Runtime Parameters for CER4.5-6.5P4

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	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.

The following parameters are required for this PGE:

SS4_5 - Sampling Strategy for Inversion, see Production Request
SS4_6 - Sampling Strategy for CER4.5-6.3P2 Input, see Production Request
SS12 - Sampling Strategy for RegridMOA, see Production Request
SS2 - Sampling Strategy for CER2.4P1 input, see CM Database
SS1_0 - Sampling Strategy for CER1.1P3 input, see CM Database
PS2_4 - Production Strategy for CER2.4P1 input, see CM Database
PS4_5 - Production Strategy for Inversion Output, see Production Request
PS4_6 - Production Strategy for CER4.5-6.5P4 Input, see Production Request
PS12 - Production Strategy for RegridMOA, see Production Request
PS1_0 - Production Strategy for Instrument, see Production Request
CC2_4 - Configuration Code for CER2.4P1 input, see CM Database
CC4_5 - Configuration Code for CER4.5-6.3P2 Output, see CM Database
CC4_6 - Configuration Code for CER4.5-6.3P2 Input, see CM Database

CC12 - Configuration Code for RegridMOA, see CM Database
CC1_0 - Configuration Code for Instrument, see CM Database

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 requested.

11.2.4 Memory/Disk Space/Time Requirements

Memory:	296050 K
Disk Space:	500 Megabytes
Total Run Time:	1:30 minutes

11.2.5 Restrictions Imposed in Processing Order

This PGE is only run upon special request.

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_6_$PS4_6/YYYY/MM/
   CER_SSFB_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH (HH = 00 .. 23)

   1. Mandatory/Optional: **This file is Mandatory.**
   2. Time Related Dependency:

      The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P2

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): **189.3**

11.3.2 Input Dataset Name (#2): SSFA

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

   $InputArchive/SSFA/$SS4_6_$PS4_6/YYYY/MM/
   CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH
   CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH.met

   1. Mandatory/Optional: **This file is Mandatory.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P2

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): **26**

11.3.3 Input Dataset Name (#3): MOA

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

   $InputArchive/data/MOA/$SS12_$PS12/YYYY/MM/

   CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH
   CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH.met

or

   CER_MOA_$SS12_$PS12_$CC12.H1
   CER_MOA_$SS12_$PS12_$CC12.H1.met
   CER_MOA_$SS12_$PS12_$CC12.H2
   CER_MOA_$SS12_$PS12_$CC12.H2.met

   Where **H1 and H2 are the ECMWF or DAS data dates (YYYYMMDDhh, where hh= 00, 06, 12, 18) that are closest to DataDate, YYYYMMDDHH. H1 must be 0-6 hours earlier than YYYMMDDHH and H2 must be 0-6 hours later than YYYYMMDDHH.**

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

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

11.3.4 Input Dataset Name (#4): GQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GQCI/$SS4_6_$PS4_6/YYYY/MM/
CER_GQCI_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

Source PGE: CER4.5-6.1P2

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): **.10**

11.3.5 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2/YYYY/MM/
CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM

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

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

Source PGE: CER2.4P1

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): **.60**

11.3.6 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2/YYYY/MM/
CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

11.3.7 Input Dataset Name (#7): IES

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

$InputArchive/IES/$SS1_0/$PS1_0/YYYY/MM/
CER_IES_$SS1_0_$PS1_0_$CC1_0.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER1.4P3

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): **32.0**

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

The Alternate Main Processor and Postprocessor production script, **run_4.5-6.5P4.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.5P4.pl**.

11.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.5P4.pl**, creates the ASCII input file and the PCF file.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.5P4/rcf
> $CERESHOME/inversion/CER4.5-6.5P4/rcf/pcfgen_4.5-6.5P4.pl -date YYYYMMDDHH

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.5P4/rcf/pcf/**:
CER4.5-6.5P4_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

11.4.2 How to Execute PGE CER4.5-6.5P4

Execute the production script by typing the script name, **run_4.5-6.5P4.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 11-4.

At the command line (>) type:

>cd $CERESHOME/inversion/CER4.5-6.5P4/rcf
>$CERESHOME/inversion/CER4.5-6.5P4/rcf/run_4.5-6.5P4.pl $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

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 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.5P4.pl**, has been designed to check for these files and 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 **CER4.5-6.5P4** terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 11-5. 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 Table 11-1) for assistance.

Table 11-5. Exit Codes for CER4.5-6.5P4

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.5P4.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. Report Log File: CER4.5-6.5P4_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

The Report Log File contains the Inversion 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: CER4.5-6.5P4_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.5P4_LogUser_$SS4_5_$PS4_5_$CC4_5.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

As mentioned in Section 11.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.5P4.pl**, 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 Subsystem 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.

Table 11-6. Expected Output File Listing for CER4.5-6.5P4

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFB/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P4, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSFA/$SS4_5_ $PS4_5/YYYY/MM)	m	26	1/hr	CER4.5-6.2P4, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER4.5-6.5P4_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.5P4/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.5P4_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH.log@($CERESHOME/inversion/ CER4.5-6.5P4/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.5P4_LogReport_$SS4_5_$PS4_5_$CC4_5. YYYYMMDDHH@($CERESHOME/inversion/runlogs)	m	.008	1/hr	N/A	Archive, rm	No
CER4.5-6.5P4_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.002	1/hr	N/A	Archive, rm	No
CER4.5-6.5P4_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.001	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/)
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
hr - hour

11.7 Expected Temporary Files/Directories

Table 11-7. Temporary Files Listing for CER4.5-6.5P4

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_5

12.0 PGEName: 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 for Aqua using Instrument Scan (IES) data.

12.1 PGE Details

12.1.1 Responsible Persons

Table 12-1. Subsystem Software Analysts Contacts

Item	Primary	Alternate
Contact Name	Victor Sothcott	Thomas Caldwell
Organization	SSAI	SSAI
Address	1 Enterprise Parkway	1 Enterprise Parkway
City	Hampton	Hampton
State	VA 23666	VA 23666
Phone	951-1683	951-1621
Fax	951-1900	951-1900
LaRC email	victor.e.sothcott@nasa.gov	thomas.e.caldwell@nasa.gov

12.1.2 E-mail Distribution List

E-mail distribution list can be obtained from the primary contact listed in Table 12-1.

12.1.3 Parent PGE(s)

Table 12-2. Parent PGEs for CER4.5-6.5P5

PGEName	Description
CER4.5-6.1P3	CERES Inversion to Instantaneous TOA Fluxes and Empirical Estimates of Surface Radiation Budget for Terra
CER12.1P1	Regrid Humidity and Temperature Fields Processor (MOA Product)
CER1.4P3	CERES Geolocate and Calibrate Earth Radiances for Aqua
CER2.4P1	CERES ERBE-like Spectral Response Functions and Correction Coefficients

12.1.4 Target PGE(s)

Table 12-3. Target PGEs after CER4.5-6.5P5

PGEName	Description
CER4.5-6.2P4	Postprocessor for SSF Subset Generation
CER5.0P2	Compute Surface and Atmospheric Radiative Fluxes
CER9.2P2	Grid TOA and Surface Fluxes

12.2 Operating Environment

12.2.1 Runtime Parameters (List all Dynamic Parameters needed at Runtime)

Table 12-4. Runtime Parameters for CER4.5-6.5P5

Parameter	Description	Data Type	Valid Values
YYYY	CERDataDateYear	I(4)	>1996
MM	CERDataDateMonth	I(2)	01 .. 12
DD	CERDataDateDay	I(2)	01 .. 31
HH	CERHrOfDay	I(2)	00 .. 23

12.2.2 Environment Script Requirements

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

The following parameters are required for this PGE:

SS4_5 - Sampling Strategy for Inversion, see Production Request
SS4_6 - Sampling Strategy for CER4.5-6.3P3 Input, see Production Request
SS12 - Sampling Strategy for RegridMOA, see Production Request
SS2 - Sampling Strategy for CER2.4P1 input, see CM Database
SS1_0 - Sampling Strategy for CER1.1P5 input, see CM Database
PS2_4 - Production Strategy for CER2.4P1 input, see CM Database
PS4_5 - Production Strategy for Inversion Output, see Production Request
PS4_6 - Production Strategy for CER4.5-6.5P5 Input, see Production Request
PS12 - Production Strategy for RegridMOA, see Production Request
PS1_0 - Production Strategy for Instrument, see Production Request
CC2_4 - Configuration Code for CER2.4P1 input, see CM Database
CC4_5 - Configuration Code for CER4.5-6.3P3, see CM Database
CC4_6 - Configuration Code for CER4.5-6.3P3 Input, see CM Database

CC12 - Configuration Code for RegridMOA, see CM Database
CC1_0 - Configuration Code for Instrument, see CM Database

12.2.3 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 requested.

12.2.4 Memory/Disk Space/Time Requirements

Memory:	296008 K
Disk Space:	500 Megabytes
Total Run Time:	2:50 minutes

12.2.5 Restrictions Imposed in Processing Order

This PGE is only run upon special request.

12.3 Processor Dependencies (Previous PGEs, Ingest Data)

12.3.1 Input Dataset Name (#1): SSFB

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

$InputArchive/SSFB/$SS4_6_$PS4_6/YYYY/MM/
CER_SSFB_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P3

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): **189.3**

12.3.2 Input Dataset Name (#2): SSFA

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

$InputArchive/SSFA/$SS4_6_$PS4_6/YYYY/MM/
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH
CER_SSFA_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH.met

1. Mandatory/Optional: **This file is Mandatory.**

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER4.5-6.1P3

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): **26**

12.3.3 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_$CC12.YYYYMMDDHH
   CER_MOA_$SS12_$PS12_$CC12.YYYYMMDDHH.met

or

   CER_MOA_$SS12_$PS12_$CC12.H1
   CER_MOA_$SS12_$PS12_$CC12.H1.met
   CER_MOA_$SS12_$PS12_$CC12.H2
   CER_MOA_$SS12_$PS12_$CC12.H2.met

   Where **H1 and H2 are the ECMWF or DAS data dates (YYYYMMDDhh, where hh= 00, 06, 12, 18) that are closest to DataDate, YYYYMMDDHH. H1 must be 0-6 hours earlier than YYYMMDDHH and H2 must be 0-6 hours later than YYYYMMDDHH.**

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

2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

b. Source of Information (Source 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): **13.31**

12.3.4 Input Dataset Name (#4): GQCI

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/GQCI/$SS4_6_$PS4_6/YYYY/MM/
CER_GQCI_$SS4_6_$PS4_6_$CC4_6.YYYYMMDDHH

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM,DD,HH

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

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

Source PGE: CER4.5-6.1P3

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): **.10**

12.3.5 Input Dataset Name (#5): SCCD

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCD/$SS2_$PS2/YYYY/MM/
CER_SCCD_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM

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

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

Source PGE: CER2.4P1

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): **.60**

12.3.6 Input Dataset Name (#6): SCCN

a. Directory Location/Inputs Expected (Including .met files, Header files, etc.)

$InputArchive/SCCN/$SS2_$PS2/YYYY/MM/
CER_SCCN_$SS2_$PS2_4_$CC2_4.YYYYMM15

1. Mandatory/Optional: **This file is Mandatory, unless $PS4_7 = 'DefaultSCC', and then the default Spectral Correction Coefficients in CERESlib will be used.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: YYYY,MM
3. Waiting Period: **None. Process when all input data are available.**

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

Source PGE: CER2.4P1

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): **.02**

12.3.7 Input Dataset Name (#7): IES

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

$InputArchive/IES/$SS1_0_$PS1_0/YYYY/MM/
CER_IES_$SS1_0_$PS1_0_$CC1_0.YYYYMMDDHH (HH = 00 .. 23)

1. Mandatory/Optional: **This file is Mandatory.**
2. Time Related Dependency:

   The DataDate must match the Runtime Parameters: 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: CER1.4P3

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): **32.0**

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

The Alternate Main Processor and Postprocessor production script, **run_4.5-6.5P5.pl**, references a Process Control File (PCF) which contains the correct file names and paths for the PGE. This PCF is created by executing the PCF generator, **pcfgen_4.5-6.5P5.pl**.

12.4.1 How to Generate the ASCII File and PCF File

The PCF generator, **pcfgen_4.5-6.5P5.pl**, creates the ASCII input file and the PCF file.

At the command line (>) type:

> cd $CERESHOME/inversion/CER4.5-6.5P5/rcf
> $CERESHOME/inversion/CER4.5-6.5P5/rcf/pcfgen_4.5-6.5P5.pl -date YYYYMMDDHH

The following files will be generated in **$CERESHOME/inversion/CER4.5-6.5P5/rcf/pcf/**:
CER4.5-6.5P5_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

12.4.2 How to Execute PGE CER4.5-6.5P5

Execute the production script by typing the script name, **run_4.5-6.5P5.pl**, followed by a string which designates the instance of the product. The string should be formatted, "Sampling Strategy"_"Production Strategy"_"Configuration Code"."DataDate". The date parameter is formatted, YYYYMMDDHH, where YYYY is the data year, MM is the data month, DD is the data day, and HH is the data hour-of-day, see Table 12-4.

At the command line (>) type:

>cd $CERESHOME/inversion/CER4.5-6.5P5/rcf
>$CERESHOME/inversion/CER4.5-6.5P5/rcf/run_4.5-6.5P5.pl $SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH

12.4.3 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.

12.4.4 Special Reprocessing Instructions

All output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.5P5.pl**, has been designed to check for these files and 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 **CER4.5-6.5P5** terminates using the CERES-defined EXIT CODES for the Langley TRMM Information System (LaTIS) as seen in Table 12-5. 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 Table 12-1) for assistance.

Table 12-5. Exit Codes for CER4.5-6.5P5

Exit Code	Definition	Action
0	Normal Exit	Proceed normally
200	Failure	Check the Log Files and take the appropriate action (see Appendix B).

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

When running the production script, **run_4.5-6.5P5.pl**, the system message, "No match," may be written to the screen. This message occurs when the script tries to remove an old output 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/inversion/runlogs**.

1. **Report Log File: CER4.5-6.5P5_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH**

The Report Log File contains the Inversion 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: CER4.5-6.5P5_LogStatus_$SS4_5_$PS4_5_$CC4_5.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: CER4.5-6.5P5_LogUser_$SS4_5_$PS4_5_$CC4_5.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.

12.5.4 Solutions to Possible Problems

As mentioned in Section 12.4.4, all output files are opened with Status = NEW in Subsystem 4.5 and 4.6 software. The PGE script, **run_4.5-6.5P5.pl**, 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 Subsystem 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.

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 744 times, maximum, in a 31 day month.

Table 12-6. Expected Output File Listing for CER4.5-6.5P5

File Name[a]/Directory	m/o	File Size (MB)	Freq/ PGE	Target PGE	Destination[b]	Available Through Ordering Tool
CER_SSFB_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/SSFB/$SS4_5_ $PS4_5/YYYY/MM)	m	189.30	1/hr	CER4.5-6.2P4, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSFA_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met) @($CERESHOME/inversion/data/SSFA/$SS4_5_ $PS4_5/YYYY/MM)	m	26	1/hr	CER4.5-6.2P4, CER5.0P2, CER9.2P2	DPO, Archive	No
CER_SSF_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/SSF/$SS4_5_ $PS4_5/YYYY/MM)	m	60	1/hr	N/A	DPO, Archive, rm	Yes
CER_GQCI_$SS4_5_$PS4_5_$CC4_5.YYYYMMDDHH (.met)@($CERESHOME/inversion/data/GQCI/$SS4_5_ $PS4_5/YYYY/MM)	m	.10	1/hr	N/A	DPO, Archive, rm	No
CER4.5-6.5P5_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH@($CERESHOME/inversion/CER4.5-6.5P5/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.5P5_PCF_$SS4_5_$PS4_5_$CC4_5.YYYYMM DDHH.log@($CERESHOME/inversion/CER4.5-6.5P5/rcf/pcf)	m	.01	1/hr	N/A	Archive, rm	No
CER4.5-6.5P5_LogReport_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.008	1/hr	N/A	Archive, rm	No
CER4.5-6.5P5_LogStatus_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.002	1/hr	N/A	Archive, rm	No
CER4.5-6.5P5_LogUser_$SS4_5_$PS4_5_$CC4_5.YYYY MMDDHH@($CERESHOME/inversion/runlogs)	m	.001	1/hr	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/)
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
hr - hour

12.7 Expected Temporary Files/Directories

Table 12-7. Temporary Files Listing for CER4.5-6.5P5

Directory	File Name[a]
$CERESHOME/inversion/data/scr	MCFWrite.temp.SS_PS_CC.YYYYMMDDHH
$CERESHOME/inversion/data/scr	GetAttr.temp.SS_PS_CC.YYYYMMDDHH

a. 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}
SS - Sampling Strategy, $SS4_5
PS - Production Strategy, $PS4_5
CC - Configuration Code, $CC4_5

References

1. Reference "Sampling Strategy, Production Strategy, and Configuration Code Implementation at the Langley TRMM and Terra Information System (LATIS)" internal paper for detail description of the CERES environment parameters. URL: http://ceres.larc.nasa.gov/Internal/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
DAAC	Distributed Active Archive Center
ECMWF	European Centre for Medium Range Weather Forecasting
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
HDF	Hierarchical Data Format
IES	Instrument Earth Scan
K	Kilobytes
LaRC	Langley Research Center
LaTIS	Langley TRMM Information System
LW	Longwave
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 Executives
PSF	Point Spread Function
PRE_SSF	Preliminary Single Satellite CERES Footprint TOA and Surface Fluxes
QC	Quality Control
SSF	Single Scanner Footprint TOA/Surface Fluxes and Clouds
SW	Shortwave
TOA	Top-of-Atmosphere
TRMM	Tropical Rainfall Measuring Mission
VD	Validation Days

Appendix B
Error Messages for Subsystem 4.5-6

Appendix B contains a list of messages that can be generated during the execution of PGEs CER4.5-6.0P6, CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.2P2, CER4.5-6.2P3, CER4.5-6.2P4, CER4.5-6.4P1, CER4.5-6.4P2, CER4.5-6.5P4, and CER4.5-6.5P5. 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 of the processing instance.

Section B.1 contains a list of the diagnostic messages for PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5. Each table entry includes a message number, the message content, the source module, the error type and the recommended action that should be taken when the message is encountered. Messages with message numbers between 100 and 199 are generated by the Main Processor. Messages with numbers between 200 and 299 are generated by the HDF conversion software. Messages with numbers between 300 and 399 are generated by the Subsetting Postprocessor. Section B.2 contains a list of the diagnostic messages for PGEs CER4.5-6.2P2, CER4.5-6.2P3 and CER4.5-6.2P4. Messages with numbers between 400 and 499 are generated by the monthly validation Postprocessor. Section B.3 contains a list of the diagnostic messages for PGEs CER4.5-6.4P1 and CER4.5-6.4P2. Section B.4 contains a list of the diagnostic messages for PGE CER4.5-6.0P6.

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 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 2-1.
5. If the appropriate ACTION failed, then call the responsible person in Table 2-1.
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 2-1.

B.1 Error Messages for CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5.

Table B-1. PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5 Error Messages

Message	Module Name	Error Type	Action
100: ERROR opening PRE_SSF file.	start_mod	Fatal	Check PCF file for request name and location of SSFI file. Verify file exists in that location.
101: PRE-SSF QA Flag set to QA_FAIL.	start_mod	Fatal	This hour should not be run while SSFI QA flag is set to FAIL.
102: ERROR in PRE_SSF header.	start_mod	Fatal	Verify MOA file is valid
103: ERROR opening PRE_SSF QC file.	start_mod	Fatal	Check PCF file for request name and location of FQCI file. Verify file exists in that location.
104: ERROR reading in PRE_SSF QC record.	start_mod	Fatal	Verify FQCI file is valid.
105: ERROR in EARTH-SUN DISTANCE.	start_mod	Fatal	Verify SSFI file is valid.
106: ERROR opening SSF file.	start_mod	Fatal	Check PCF file for request name and location of SSFB file. Verify old file with the same name does not exist.
107: Unable to determine CERES instrument.	start_mod	Warning	None
108: MOA file open.	start_mod	Status	None
109: Unable to determine data month from SSF header.	start_mod	Warning	None
110: Unable to obtain Spcor model number from PCfile.	start_mod	Fatal	Check PCF file.
111: Unable to obtain Surface algorithm flag from PCfile.	start_mod	Fatal	Check PCF file.
112: ERROR opening MOA file.	access_anc	Fatal	Check PCF file for request name and location of MOA file. Verify file exists in that location.
113: ERROR READING MOA.	access_anc	Fatal	Verify MOA file is valid.
114: MOA production date, YYYYMMDDHH not equal to MOA date on interim SSF - YYYYMMDDHH.	access_anc	Warning	None: QA flag of SSFB will be marked SUSPECT.
115: ERROR in reading TOOLKIT file earthfigure.dat.	access_anc	Fatal	Verify Toolkit file, earthfigure.dat, exists.
116: Reported surface area for FOV XX is YY percent (YY. > 100%).	scene_id_mod	Warning	None
117: Reported surface area for FOV XX is 0 percent.	scene_id_mod	Warning	None
118: ERROR opening SCCOEF file.	spcor_mod	Fatal	Check PCF file for request name and location of SCC file. Verify file exists in that location.
119: ERROR reading SCCOEF file.	spcor_mod	Fatal	Verify IISC** file is valid.
120: Invalid Spectral Correction Algorithm Selected.	spcor_mod	Fatal	Check PCF file for valid Spectral Correction model number.
121: ERROR reading from PRE-SSF file.	process_fov_mod	Fatal	Verify SSFI file is valid.
122: ERROR writing to SSF file.	process_fov_mod	Fatal	Check for system problem.
123: END of FILE read on PRE-SSF file.	process_fov_mod	Status	None

Table B-1. PGEs CER4.5-6.1P2, CER4.5-6.1P3, CER4.5-6.1P6, CER4.5-6.1P7, CER4.5-6.5P4, and CER4.5-6.5P5 Error Messages

Message	Module Name	Error Type	Action
124: NUMBER OF FOOTPRINTS READ, XX, NOT EQUAL TO NUMBER OF SSF FOOTPRINTS REPORTED ON INPUT SSF HEADER, YY.	final_mod	Warning	None: QA flag of SSFB will be marked SUSPECT.
125: ERROR closing SSF file - no metadata written.	final_mod	Fatal	Check for system problem.
126: ERROR writing the SSF QC record.	final_mod	Fatal	Check for system problem.
127: ERROR closing SSF Bin QC file - no metadata written.	final_mod	Fatal	Check for system problem.
128: ERROR closing SSF ASCII QC file - no metadata written.	final_mod	Fatal	Check for system problem.
129: Unable to obtain CERHRofDay from PCfile.	start_mod	Fatal	Check PCF file.
130: ERROR opening IES file	start_mod	Fatal	Check PCF file for request name and location of IES file. Verify file exists in that location.
131: ERROR reading IES header	start_mod	Fatal	Verify IES file is valid
132: ERROR closing IES file	final_mod	Warning	None
133: ERROR reading from IES file	process_fov_mod	Fatal	Verify IES file is valid
200: SSF QA Flag set to QA_FAIL. HDF file will not be created.	ssf2hdf	Fatal	This hour should not be run while SSFB QA flag is set to FAIL.
201: Subroutine XXX could not open SSF YYY file (where XXX = ssf_tk_open or ssfa_tk_open and YYY = 'binary' or 'aerosol').	ssf2hdf	Fatal	Check PCF file for request name and location of SSFB or SSFA file. Verify file exists in that location.
202: Could not close SSF XXX file (where XXX = 'binary' or 'aerosol').	ssf2hdf	Fatal	Check for system problem.
203: Could not open HDF file, XXX.	ssf2hdf	Fatal	Check PCF file for request name and location of SSF file.
204: Error initializing HDF file, XXX.	ssf2hdf	Fatal	Check for system problem.
205: Unable to write SSF_header Vdata to HDF file, XXX.	ssf2hdf	Fatal	Check for system problem.
206: Could not close HDF file, XXX.	ssf2hdf_params	Fatal	Check for system problem.
207: Invalid SDS number.	ssf2hdf_params	Fatal	Contact Analyst
208: Unable to write SDS : ZZZ for record NNN.	ssf2hdf_params	Fatal	Check for system problem.
209: Error getting reference number for SDS number NNN.	ssf2hdf_params	Fatal	Check for system problem.
210: SDS NNN was not created : ZZZ.	ssf2hdf_params	Fatal	Check for system problem.
211: Error in naming dimension MMM on SDS number NNN.	ssf2hdf_params	Fatal	Check for system problem.
212: Error compressing SDS ZZZ.	ssf2hdf_params	Fatal	Check for system problem.
213: Unable to obtain value of runtime parameter, XXX,, from PCfile (where XXX = 'WrFlux' or 'Aerosol_flag').	ssf2hdf	Fatal	Check PCF file.
214: Binary SSF header does not match SSFA header.	ssf2hdf	Fatal	Check PCF file.

B.2 Error Messages for CER4.5-6.2P2, CER4.5-6.2P3, and CER4.5-6.2P4

Table B-2. PGEs CER4.5-6.2P2, CER4.5-6.2P3, and PGE CER4.5-6.2P4 Error Messages

Message	Module Name	Error Type	Action
301: ERROR opening subsetted SSF nighttime file.	subset_ssf	Fatal	Check PCF file for request name and location of SSFS-NIT file. Verify file exists in that location.
302: ERROR opening subsetted SSF nighttime file.	subset_ssf	Fatal	Check PCF file for request name and location of SSFS-DAY file. Verify file exists in that location.
303: ERROR closing Binary SSF file.	subset_ssf	Fatal	Check for system problem.
304: ERROR opening Binary SSF file.	subset_ssf	Fatal	Check PCF file for request name and location of FQCI file. Verify file exists in that location.
305: ERROR closing Subsetted SSF nighttime file.	subset_ssf	Fatal	Check for system problem.
306: ERROR closing Subsetted SSF daytime file.	subset_ssf	Fatal	Check for system problem.
307: ERROR reading from Binary file.	process_fov_mod	Fatal	Verify SSFB file is valid.
308: ERROR writing to Subsetted SSF file.	process_fov_mod	Fatal	Check for system problem.
309: END of FILE read on Binary file.	process_fov_mod	Status	None
310: ERROR in FOV date.	process_fov_mod	Fatal	Verify SSFB file is valid.
311: ERROR reading from Binary file.	sort_ssf_mod	Fatal	Verify SSFB file is valid.
312: ERROR - illegal record number. WRITE IGNORED.	ssf2_write_mod	Warning	None
313: IO STATUS = xxxxxx ERROR WRITING SSFS RECORD xxxxxx.	ssf2_write_mod	Warning	None
314: COULD NOT READ SSF SUBSET HEADER FOR FILE: xxxxxx.	ssf2_typdef	Fatal	Verify SSFS file is valid.
315:EXPECTED SSFS ID = xxxxxx READ PRODUCT ID= xxxxxx ASSUME INCORRECT INPUT FILE.	ssf2_typdef	Fatal	Verify SSFS file is valid.
316: EXPECTED TO READ HEADER RECORD FOR FILE: xxxxx , BUT NO FORMAL PARAMETER FOR IT PASSED IN.	ssf2_typdef	Fatal	Verify SSFS file is valid.
317: COULD NOT OPEN FILE: xxxxx , IO STATUS ERROR = .	ssf2_typdef	Fatal	Verify SSFS file is valid.
318: UNABLE TO WRITE HEADER TO SSFS.	ssf2_typdef	Fatal	Verify SSFS file is valid.
319: RECORD = xxxxxx IS ILLEGAL. READ IGNORED.	ssf2_typdef	Warning	None
320: Error in User Defined Runtime Parameter flag setting combination.	subset_ssf	Fatal	Check PCF file for User Defined Runtime Parameter flag settings. Verify DayNight is set if Aerosol is set, Validation is set if Validation Aerosol is set, and that at least one flag is set.

B.3 Error Messages for CER4.5-6.4P1 and CER4.5-6.4P2

Table B-3. PGEs CER4.5-6.4P1 and CER4.5-6.4P2 Error Messages

Message	Module Name	Error Type	Action
401: Unable to obtain value of runtime parameter, XXX,, from PCfile (where XXX = 'WrFlux' or 'Aerosol_flag').	ssf_monthly_val	Fatal	Check PCF file.
402: Both PCF production flags turned off.	ssf_monthly_val	Fatal	Check PCF file. Turn on production of at least one product.
403: ERROR opening SSF monthly validation output file.	ssf_monthly_val	Fatal	Check PCF file for request name and location of SSFB file. Verify old file with the same name does not exist.
404: ERROR opening monthly aerosol validation output file.	ssf_monthly_val	Fatal	Check PCF file for request name and location of SSFB file. Verify old file with the same name does not exist.
405: ERROR opening daily SSF input file.	ssf_monthly_val	Fatal	Check PCF file for request name and location of SSFB-val file. Verify file exists in that location.
406: ERROR opening daily SSF aerosol input file.	ssf_monthly_val	Fatal	Check PCF file for request name and location of SSFA-val file. Verify file exists in that location.
407: END of FILE read on daily SSF validation input file.	ssf_monthly_val	Fatal	Check for system problem.
408: ERROR reading from daily SSF validation input file.	ssf_monthly_val	Fatal	Verify SSFB-val file is valid.
409: END of FILE read on validation aerosol input file.	ssf_monthly_val	Fatal	None
410: ERROR reading from validation aerosol input file.	ssf_monthly_val	Fatal	Verify SSFA-val file is valid.
411: ERROR writing SSF monthly validation file.	ssf_monthly_val	Fatal	Check for system problem.
412: ERROR writing monthly aerosol validation file.	ssf_monthly_val	Fatal	Check for system problem.
413: ERROR closing daily SSF validation file.	ssf_monthly_val	Status	Check for system problem.
414: ERROR closing daily SSF validation file.	ssf_monthly_val	Status	Check for system problem.
415: ERROR opening a daily SSF validation file.	ssf_monthly_val	Status	None
416: ERROR closing monthly SSF validation file.	ssf_monthly_val	Status	Check for system problem.
417: ERROR closing monthly SSF validation aerosol file.	ssf_monthly_val	Status	Check for system problem.
418: ERROR closing SSF ASCII station data file - no metadata written.	ssf_monthly_val	Status	Check for system problem.

B.4 Error Messages for CER4.5-6.0P6

Table B-4. PGEs CER4.5-6.0P6 Error Messages

Message	Module Name	Error Type	Action
502: ERROR opening sibiMap output file.	mapSpecModels	Fatal	Check PCF file for request name and location of sibiMap file. Verify old file with the same name does not exist.
500: ERROR opening SSF file.	mapSpecModels	status	Check PCF file for request name and location of SSF file. Verify file exists in that location.
501: ERROR closing SSF file.	mapSpecModels	Status	Check for system problem.
503: ERROR closing sibiMap file.	mapSpecModels	Status	Check for system problem.