

**Code 582**  
Flight Software Branch

**CORE FLIGHT EXECUTIVE  
BUILD 6.4.0.0**

**FLIGHT SOFTWARE BUILD VERIFICATION  
TEST REPORT**

**Flight Software Branch – Code 582**

**Version 1.0**

**SIGNATURES**

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Submitted by:

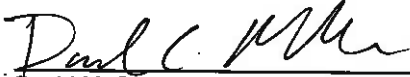


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**PLAN UPDATE HISTORY**

Version	Date	Description	Affected Pages
1.0		cFE build 6.4.0.0 verification test report	all

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## 1 INTRODUCTION

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### 1.1 DOCUMENT PURPOSE

This Test Report describes the test results from the core Flight Executive (cFE) Flight Software (FSW) Test Team build 6.4.0.0 verification testing. It is used to verify that the cFE FSW has been tested in a manner that validates that it satisfies the functional and performance requirements defined within the cFE FSW Requirements Specification and all Discrepancy/Change Request (DCR) fixes and code updates assigned to build 6.4.0.0. This Test Report summarizes the FSW test history, the build verification process, the build test configuration, and the test execution and results

### 1.2 APPLICABLE DOCUMENTS

Unless otherwise stated, these documents refer to the latest version.

#### Parent Documents (Mission and FSW)

- 582-2000-012 FSB Flight Software TestBed Requirements Guidelines

#### Reference Documents

All of the references below can be found on the Code 582 internal website at <https://fsb.gsfc.nasa.gov/>

- 582-2003-001 FSB FSW Test Plan Template
- 582-2004-001 FSB FSW Test Description Template
- 582-2004-002 FSB FSW Test Scenario Template
- 582-2004-003 FSB FSW Test Procedure Template
- 582-2004-004 FSB FSW Test Execution Summary Template
- 582-2004-005 FSB Test Product Peer Review Form
- 582-2000-002 FSB FSW Unit Test Standard
- 582-2007-040 FSB Test Analysis Summary Template
- 582-2008-006 FSB Testbed Validation Description

### 1.3 DOCUMENT ORGANIZATION

Section 1 of this document presents some introductory material.

Section 2 provides a flight software overview and context along with the test history and testing overview.

Section 3 describes the build verification process including procedure development and execution and test products produced.

Section 4 describes the build test configuration which includes an overview of the testbed and the requirements verification matrix.

Section 5 describes the test execution and results by subsystem.

Appendix A - provides the Requirements Traceability Matrix

Appendix B - provides the Command, Telemetry, and Events Verification Matrix

## 2 OVERVIEW

### 2.1 FLIGHT DATA SYSTEM CONTEXT

Build verification was performed using cFE in a single flight processor context, as depicted in Figure 2-1. The ground system interfaces with the flight Applications Command Ingest (CI) and Telemetry Output (TO) and not directly with the cFE. Spacecraft operators send Commands and Files to the cFE and receive Files, Events, and Telemetry from the cFE. Note that this context is relative to the cFE and does not show ground communications with other Applications. For example, a typical spacecraft has a Stored Command (SC) Application that receives stored command loads from the ground and sends stored command dumps to the ground.

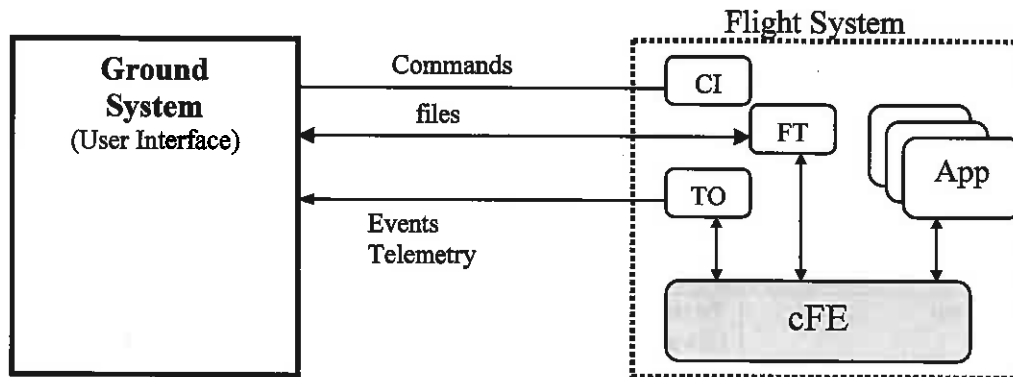


Figure 2-1 cFE Single Flight Processor Context

### 2.2 TEST HISTORY

cFE 3.3 – Build Verification Testing completed 9/2006 by Walt Moleski  
cFE 4.0.0 – Regression Testing completed 12/2006 by Walt Moleski  
cFE 4.0.0 – Build Verification Testing completed 3/2007 by Walt Moleski  
cFE 4.0.1 – Build Verification Testing completed 4/2007 by Walt Moleski  
cFE 4.1.0 – Build Verification Testing completed 7/6/2007 by Walt Moleski  
cFE 4.2.0 – Build Verification Testing completed 8/16/2007 by Walt Moleski  
cFE 4.2.1 – Build Verification Testing completed 9/24/2007 by Walt Moleski  
cFE 5.0.0 – Build Verification Testing completed 11/7/2007 by Walt Moleski  
cFE 5.2.0 – Build Verification Testing completed 10/6/2008 by Walt Moleski  
cFE 6.0.0 – Build Verification Testing completed 8/18/2009 by Walt Moleski  
cFE 6.1.1.0 – Build Verification Testing completed 11/30/2010 by Walt Moleski  
cFE 6.2.2.0 – Build Verification Testing completed 10/3/2011 by Walt Moleski  
cFE 6.3.1.0 – Build Verification Testing completed 2/21/12 by Walt Moleski  
cFE 6.3.2.0 – Build Verification Testing completed 5/1/12 by Walt Moleski  
cFE 6.4.0.0 – Build Verification Testing completed 9/24/14 by Walt Moleski

### 2.3 TESTING OVERVIEW

There are 5 cFE core subsystems that are tested during Build Verification testing. There are a total of 22 test procedures that are executed. These test procedures are modified to test any new capabilities developed in a build as well as DCR fixes that were contained in a build.

For each build prior to cFE 6.0.0, a new test account was created for the testers to use. As of cFE 6.0.0, a single cfe\_test account is used. This account runs the Advanced Spacecraft Integration and System Test

### 3 BUILD VERIFICATION TEST PREPARATION

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#### 3.1 SCENARIO DEVELOPMENT

There were no new scenarios developed for build verification test 6.4.0.0. All scenarios are stored on the MKS server, in cfe-project test-and-ground directory within the test-review-packages subdirectory in the Scenarios folder.

#### 3.2 PROCEDURE DEVELOPMENT AND EXECUTION

This build test was completed by running 22 test procedures, 3 for Executive Services (ES), 2 for Time Services (TIME), 5 for Event Services (EVS), 4 for Software Bus (SB), 4 for Table Services (TBL), and 4 procedures that required the cFE Core software to be modified. All test procedures were written using the Spacecraft Test and Operations Language (STOL). The naming convention for files output from these test procedures was: `scx_cpu<#>_<procedure name>_GMT.<ext>`.

#### 3.3 TEST PRODUCTS

Five log files were generated for every procedure that was run. They are defined as follows:

- Logs with the .loge extension list all events sent by the flight software
- Logs with the .logr extension list all requirements that passed validation by demonstration
- Logs with the .logp extension lists all prints that are generated by the test procedure
- Logs with the .logf extension lists everything from the other logs along with the steps in the test procedure
- Logs with the .logs extension lists the Standard Formatted Data Unit (SFDU) information (if applicable) contained in the full log.

A Test Report is developed by the tester after build testing is completed. The log files are stored on CFEASIST in the \$WORK/test\_logs/cFE6.4.0.0 folder. The data files generated are stored in the \$WORK/image folder. All test products are maintained on MKS in the cfe-project test-and-ground directory.

## 4.2 REQUIREMENTS VERIFICATION MATRIX

Subsystem	Requirements Tested Passed	Requirements Tested Failed	Requirements Tested Partially	Total Tested	Deferred	Total
Executive Services (ES)	141	0	0	141	7	148
Time Services (TIME)	33	0	0	33	6	39
Event Services (EVS)	65	0	0	65	0	65
Software Bus (SB)	35	0	0	35	0	35
Tables (TBL)	51	0	0	51	0	51

## 4.3 REQUIREMENTS PARTIALLY TESTED

No requirements were partially tested.

## 4.4 REQUIREMENTS DEFERRED

The rationale for why these requirements are deferred is contained in the Requirements to Test Traceability Matrix (RTTM). Please refer to that document for additional information.

Requirement	Description
cES1324	Upon receipt of a Request, the cFE shall load and initialize a hardware device driver and connect it with the specified hardware handshaking and device processing code.
cES1325	Upon receipt of a Request, the cFE shall unload a specified hardware device driver and de-allocate all previously allocated resources used by the driver.
cES1326	Upon receipt of a Request, the cFE shall disable a specified hardware device driver.
cES1326.1	If the specified hardware device driver is not loaded, then the cFE shall record the error in the System Log, and return an error code.
cES1327	Upon receipt of a Request, the cFE shall re-enable a specified hardware device driver.
cES1327.1	If the specified hardware device driver is not loaded, then the cFE shall record the error in the System Log, and return an error code.
cES1508.3	The cFE shall create and initialize cFE Device Drivers according to the entry in the cFE Startup File.
cTIME2012.1	The cFE shall ignore Time Updates while in Flywheel state.
cTIME2013	Upon receipt of Command the cFE shall adjust the spacecraft time by adding the Command specified value (seconds and subseconds) to spacecraft time
cTIME2014	Upon receipt of Command the cFE shall adjust the spacecraft time by subtracting the Command specified value (seconds and subseconds) from spacecraft time
cTIME2701	The cFE Time Services Server shall send a "time at the tone" Software Bus message within a <MISSION_DEFINED> period of time preceding or following the tone.
cTIME2702	The cFE Time Services Server shall update its MET using the timer hardware interface defined in the cFE Application Developer's Guide.
cTIME2703	The cFE shall define a MET with a <MISSION_DEFINED> resolution.



## 5 BUILD VERIFICATION TEST RESULTS

### 5.1 EXECUTIVE SERVICES (ES)

#### 5.1.1 Overall Assessment

During this build test of the ES subsystem:

- 113 requirements passed demonstration
- 28 requirements were validated by analysis.
- 7 requirements were deferred for Mission testing
- No new DCRs were generated
- 19 DCRs were verified

#### 5.1.2 Procedure Description

Procedure	Description	Requirements tested
es_appctrl	The purpose of this test is to verify the cFE Executive Services (ES) software meets the requirements defined in the SRS for the defined Executive Services logs (System, Exception and Reset, and Logic Analyzer Capture).	cES1005, cES1005.1, cES1005.2, cES1005.3, cES1005.4, cES1006, cES1006.1, cES1007, cES1007.1, cES1007.2, cES1007.3, cES1008, cES1008.1, cES1008.2, cES1008.3, cES1011, cES1012, cES1012.1, cES1013, cES1013.1, cES1026, cES1027, cES1300, cES1302, cES1303, cES1304, cES1305, cES1306, cES1307, cES1309, cES1309.1, cES1310, cES1310.1, cES1310.2, cES1310.3, cES1311, cES1311.1, cES1311.2, cES1312, cES1312.1, cES1313, cES1314, cES1314.1, cES1315, cES1315.1, cES1315.2, cES1316, cES1316.1, cES1316.2, cES1319, cES1320, cES1320.1, cES1320.2, cES1321, cES1321.1, cES1321.2, cES1321.3, cES1322, cES1322.1, cES1323, cES1328, cES1328.1, cES1328.2, cES1700, cES1708
es_logging	The purpose of this test is to verify the cFE Executive Services (ES) software meets the requirements defined in the SRS for the defined Executive Services logs (System, Exception and Reset, and Logic Analyzer Capture).	cES1005, cES1005.1, cES1009, cES1010, cES1014, cES1014.1, cES1014.2, cES1014.2.1, cES1014.2.2, cES1015, cES1016, cES1016.1, cES1017, cES1018, cES1019, cES1021, cES1022, cES1022.1, cES1022.2, cES1023, cES1023.1, cES1024, cES1025, cES1028, cES1509, cES1510, cES1511, cES1512, cES1520, cES1522, cES1702, cES1702.1, cES1702.2, cES1703, cES1703.1, cES1703.2, cES1706, cES1707, cES1709

### 5.1.3 Analysis Requirements Verification

The following ES requirements were verified using analysis.

Requirement	Description	Status	Justification
cES1014.1	Each entry in the Executive Services System Log shall be time tagged with the time that the event happened.	Pass	There are several system log files dumped to the ground that can verify this requirement. The scx_cpu3_es_syslog15.log was viewed and it contained time-stamped entries.
cES1014.2	The cFE shall calculate the number of bytes used and number of entries in Executive Services System Log	Pass	The ES Housekeeping display page in ASIST contains this information. Steps 1.11 of the ES_Logging test procedure attempt to fill the ES System Log and utilize the bytes used and print the number of entries contained in the System Log.
cES1014.2.1	If the Executive Services System Log is full and the System Log Mode is set to OVERWRITE then the cFE shall write all new entries from the top of the log	Pass	The system log dump file scx_cpu3_es_syslog117.log verifies this requirement by showing a new entry in the system log at the top of the file.
cES1014.2.2	If the Executive Services System Log is full and the System Log Mode is set to DISCARD then the cFE shall discard all new entries	Pass	Step 1.11.4 writes a system log message when the mode is DISCARD. The files scx_cpu3_es_syslog1113.log and scx_cpu3_es_syslog1115.log were viewed. Both logs contained the same entries and the entry written in Step 1.11.4 was not contained in the scx_cpu3_es_syslog1115.log file.
cES1017	The cFE shall maintain an Executive Services Exception and Reset Log which will log critical system data for exceptions and resets including: <ul style="list-style-type: none"> <li>• A time stamp</li> <li>• Processor Context information</li> <li>• Critical system variables</li> <li>• ASCII string stating the reason for the reset</li> </ul>	Pass	The Exception and Reset Log contained the stated components. This was verified by viewing the ASIST display page after transferring the scx_cpu3_er13.log file to the ground.
cES1022.1	The cFE shall store a timestamp along with the specified Logic Analyzer Capture Tag.	Pass	There are 2 performance log files generated by the ES_Logging test procedure. Viewing these files in the Software Timing Analyzer tool verified that each entry contained a timestamp.

<b>Requirement</b>	<b>Description</b>	<b>Status</b>	<b>Justification</b>
cES1505	Upon a Power-on Reset, the cFE shall create all operating system objects required by the cFE.	Pass	There are two system log files dumped by the ES_Reset test procedure that verify this requirement. The files scx_cpu3_es_syslog145.log and scx_cpu3_es_syslog45.log contain an entry indicating that the system objects were created.
cES1508.2	The cFE shall create and initialize cFE Shared Libraries according to the entry in the cFE Startup File.	Pass	The scx_cpu3_es_syslog145.log file contains an entry indicating that the cFE Test Library was initialized. This is the library contained in the startup script used when the system is started or reset.
cES1511	Upon a Processor Reset, the cFE shall preserve the Executive Services System Log.	Pass	The scx_cpu3_es_syslog1.log is dumped by the ES_Reset test procedure when a Processor Reset occurs. This file contained the previous entries and thus was preserved.
cES1512	Upon a Processor Reset, the cFE shall preserve the Executive Services Exception and Reset Log.	Pass	The Exception and Reset log was dumped after performing two Processor Resets in the ES_Reset test procedure. The files scx_cpu3_es_erlog35.log and scx_cpu3_es_erlog55.log contained the previous entries and thus were preserved.
cES1515	Upon a Processor Reset, the cFE shall create all operating system objects required by the cFE.	Pass	The scx_cpu3_es_syslog1.log file generated by the ES_Reset test procedure when a Processor Reset occurs contains an entry indicating that the system objects were created.
cES1515.1	If the creation of the operating system object fails, the cFE shall perform a power on reset.	Pass	The verification of this requirement required an alternate image of the cFE flight software. An operating system object for the CFE_ES task was modified to use a stack size that was less than the cFE requirements for that parameter. When this software was loaded, the cFE reported the error for the CFE_ES task and continuously reset until the original cFE flight software image was loaded back.
cES1518.2	The cFE shall create and initialize Shared Libraries according to the entry in the cFE Startup File.	Pass	Step 3.5 in the ES_Reset test procedure dumps the System Log to the scx_cpu3_es_syslog1.log file. This file contains an entry indicating that the cFE shared Library was initialized.

Requirement	Description	Status	Justification
cES1703.3	If the Floating Point exception was caused by the OS or cFE Core then the cFE shall initiate a <PLATFORM_DEFINED> response.	Pass	An alternate cFE flight software image was created to test these requirements. The ES_NOOP command software was modified to cause an exception to be generated. When this command was executed using the default exception handler, the cFE performed a Processor Reset. When this command was executed with the User-Defined exception handler, the cFE executed that exception handler as shown in the uart file captured.
cES1704	The cFE shall support a <PLATFORM_DEFINED,TBD> byte volatile file system.	Pass	This requirement was tested manually from the ASIST console by uploading a large file to the volatile file system and then attempting to generate another file. When the file system is full, the additional file creation command fails. I then removed the large file and issued the command again. This time the command passed and created the file. Although the uart output was not captured, the errors as well as the successful writes were contained in the uart.
cES1705	The cFE shall support a <PLATFORM_DEFINED,TBD> byte non-volatile file system.	Pass	The non-volatile file system was inspected and verified on the test CPU.

#### 5.1.4 DCRs

No new DCRs were generated.

#### 5.1.5 Notes

There were no significant findings and/or anomalies reported during testing.

### 5.2.3 Analysis Requirements Verification

The following TIME requirements were verified using analysis.

Requirement	Description	Status	Justification
cTIME2314	Upon receipt of a Request the cFE shall return the provided system time in the following format; yyyy-ddd-hh:mm:ss.xxxxx\0	Pass	This requirement can be verified by looking at any ES System Log dump file generated by the cFE 6.4.0.0 test procedures. This was done and the time format was present in the system log.

### 5.2.4 DCRs

No new DCRs were generated during 6.4.0.0 testing.

### 5.2.5 Notes

There were no significant findings and/or anomalies reported during testing.

## 5.3 EVENT SERVICES (EVS)

### 5.3.1 Overall Assessment

During this build testing of the EVS subsystem:

- 56 requirements were validated by demonstration
- 9 requirements were validated by analysis
- No new DCRs were generated during testing
- 2 DCRs were verified

### 5.3.2 Procedure Description

Procedure	Description	Requirements tested
evs_evt_msg_gen	The purpose of this test is to verify the functionality of the cFE Event Message generation software for Events Messages that are registered for filtering as well as Event Messages that are not registered for filtering.	cEVS3004, cEVS3007, cEVS3008, cEVS3012, cEVS3018, cEVS3100, cEVS3100.1, cEVS3100.2, cEVS3100.3, cEVS3101, cEVS3102, cEVS3103, cEVS3103.1, cEVS3103.2, cEVS3103.3, cEVS3103.4.1, cEVS3103.6, cEVS3103.7, cEVS3104, cEVS3105, cEVS3109
evs_cmds	The purpose of this test is to verify the CFE_EVS Command functionality for the Event Service (CFE_EVS) function of the Core Flight Executive (cFE). The operation of all CFE_EVS commands will be verified for valid and invalid commands.	cEVS3000, cEVS3002, cEVS3003, cEVS3004, cEVS3004.1, cEVS3005, cEVS3006, cEVS3007, cEVS3008, cEVS3009, cEVS3010, cEVS3011, cEVS3017, cEVS3018, cEVS3300

### 5.3.3 Analysis Requirements Verification

The following EVS requirements were verified using analysis.

Requirement	Description	Status	Justification
cEVS3015	<OPTIONAL> Upon receipt of Command, the cFE shall write the contents of the Local Event Log to the Command specified file.	Pass	Steps 4.5.1 and 4.5.2 sent commands specifying a filename and using the default filename for writing the contents of the Local Event Log. These files were transferred to the ground and displayed in the EVS_LOG ASIST display page. Both commands displayed the contents of the files.
cEVS3015.1	If a file is not specified, the cFE shall use the <PLATFORM_DEFINED> filename.	Pass	Steps 4.5.1 and 4.5.2 sent commands specifying a filename and using the default filename for writing the contents of the Local Event Log. These files were transferred to the ground and displayed in the EVS_LOG ASIST display page. Both commands displayed the contents of the files.
cEVS3016	<OPTIONAL> The cFE shall write each Event Message from the earliest logged message to the most recently logged message.	Pass	Step 7.5.1 of the EVS_Log test procedure verifies this requirement. The step dumps the local event log and then prints it in the procedure log file. The entries of the log were in earliest to latest order.
cEVS3100	Upon receipt of Request, the cFE shall register an Application for event service, enabling the Application Event Service Enable Status and storing the following request specified Application data: Application Event IDs (for events to be filtered) Application Binary Filter Masks (one per registered Event ID)	Pass	The EVS Housekeeping, EVS_App_Data_Main and EVS_App_Data display pages were used to verify this requirement. All the listed applications in this display page were registered for event services. The event filter masks and messages were viewed in the EVS_App_Data display page.
cEVS3103.6	The requester shall be able to specify the Application ID to be used in the Event Message	Pass	This requirement was verified by viewing the log file and verifying that the event message contained the specified item.
cEVS3103.7	The requester shall be able to specify the time to be used in the Event Message.	Pass	This requirement was verified by viewing the log file and verifying that the event message contained the specified item.

## 5.4 SOFTWARE BUS SERVICES (SB)

### 5.4.1 Overall Assessment

During SB build verification testing

- 33 requirements were validated by demonstration
- 2 requirements were validated by analysis
- No new DCRs were generated
- 12 DCRs were verified

### 5.4.2 Procedure Description

Procedure	Description	Requirements tested
sb_enapipes	The purpose of this test is to verify that the flight software satisfies the requirements relating to enabling pipes.	cSB4000, cSB4003, cSB4004, cSB4005, cSB4007, cSB4007.1, cSB4300, cSB4301, cSB4302, cSB4303, cSB4304, cSB4305, cSB4305.5, cSB4305.6, cSB4306, cSB4307, cSB4308, cSB4309, cSB4701, cSB4704, cSB4705
sb_dispipes	The purpose of this test is to verify that the flight software satisfies the requirements relating to disabling pipes.	cSB4001, cSB4002, cSB4003, cSB4003.1, cSB4005, cSB4008, cSB4008.1, cSB4301, cSB4303, cSB4305.1, cSB4305.3, cSB4305.4, cSB4500, cSB4700, cSB4705, cSB4706
sb_cmds_err	The purpose of this test is to verify that the flight software will reject SB commands with bad data in the command fields.	cSB4004, cSB4005, cSB4305.6, cSB4701
sb_reset	The purpose of this test is to verify that the SB flight software handles a Power-On and Processor reset according to the requirements.	cSB4303, cSB4303.1, cSB4310, cSB4311, cSB4311.1, cSB4500, cSB4501

### 5.4.3 Analysis Requirements Verification

The following SB requirements were verified using analysis.

Requirement	Description	Status	Justification
cSB4300	The cFE shall provide a zero-copy message transfer mode for intra-processor communication.	Pass	Step 11.0 of the sb_enapipes procedure tests this requirement. The TST_SB application generates an event message that prints the pointer of the SB zero copy message being sent and also generates an event message when the zero copy message is received. The pointers were identical.

	<b>On and Processor Resets</b>	
tbl_validate	The purpose of this test is to verify that the cFE Table Services (TBL) provide a capability to validate the Spacecraft ID and Processor ID contained in a table load image file.	DCR 15179 documents this capability. No requirements were tested.
cfe_no_tbl_app	The purpose of this procedure is to validate that Table Services (CFE_TBL) is not running. This test verifies DCR# 22743 which decouples Table Services from the cFE Core.	None

### 5.5.3 Analysis Requirements Verification

The following TBL requirements were verified using analysis.

Requirement	Description	Status	Justification
cTBL6308.1	If a Table is locked when an update Request is made, an appropriate error code shall be returned to the calling Application and the update shall not occur.	Pass	The uart output captured for the tbl_func test procedure contained an error indicating that the table was locked. Once the lock was removed, the table was updated appropriately.
cTBL6311.1	Upon providing a calling Application with the addresses of a Tables' data, the cFE shall lock the contents of the Tables to prevent modification.	Pass	Step 18.2 of the TBL_func test procedure attempts to update a table that is shared by another application. The error message displayed indicating that the table did not have any working buffers available to perform the update.

### 5.5.4 DCRs

No new DCRs were generated.

### 5.5.5 Notes

There were no significant findings and/or anomalies reported during testing.



DCR	Description	Test Method	Test Approach
18683	ES – Uninitialized Variable	Inspection	The code was inspected and verified.
18686	SB – Uninitialized Variable in ZeroCopyGetPtr	Inspection	The code was inspected and verified.
18858	Update Table Definition Macro to support GCC compiler	Inspection	The code was inspected and verified.
18931	cFe SB GetMsgTime function does not return the proper subseconds	Inspection	The code was inspected and verified.
18932	MMS-IVV-OBS-1629- SCFSW Build 3.5 Static Code Analysis: Pointer dereferenced before use in cfe_tbl_api.c	Inspection	The code was inspected and verified.
18962	ES Reset Subtype can be incorrect on a commanded processor reset	Test Procedure	The code was inspected and verified. Also, the cfe_es_reset test procedure verifies the subtype changes.
19080	SB Memory Utilization	Test Procedure	The updated mnemonics contained values when running the SB tests.
19141	CFE ES Shell command “ES_ListTasks” does not work	Test Procedure	The ES_Shell command was sent using the command browser. The specified output file contained the task information.
19413	Memory leak when SB zero-copy-send fails to send the message	Inspection	The code was inspected and verified.
19487	Remove ‘Size’ argument in CFE_SB_GetBufferFromCaller	Inspection	The code was inspected and verified.
19498	SB buffers-in-use count goes negative for zero copy transfers	Test Procedure	Two additional commands were added to the TST_SB application to call the CFE_SB API functions. The first allocates a Zero Copy Pointer and the second releases that pointer. The scx_cpu3_dcr19498 test procedure utilizes these commands to verify that the Buffers-In-Use counter increments and decrements properly.
19511	Table Services File Header Definition does not match RDL definition	Inspection	The code was inspected and verified.
19578	SB Zero Copy Descripto Buffer release keeps SB locked on error	Inspection	The code was inspected and verified.
21030	ES: missing open parenthesis	Test Procedure	Since the cFE code compiles properly, this DCR is verified.
21072	Add table name to telemetry for table load command (proposed improvement requested by MMS FOT)	Test Procedure	All Table Services tests load tables. The Last Table Loaded name was added to the TBL HK page and verified during testing.
21203	FS – Decompression Algorithm should delete files when decompression error is detected	Inspection	The code was inspected and verified.
21211	Add configuration parameter to update TIME_1HZ_TASK Stack size	Test Procedure	The configuration parameters were added to the platform configuration file. Also, verification was tested by using a configuration file that did not contain these new parameters, The proper error messages were generated
21218	ES – Mempool Info command does not work on unaligned Memory Pool	Inspection	The code was inspected and verified.

<b>DCR</b>	<b>Description</b>	<b>Test Method</b>	<b>Test Approach</b>
22677	ES – Application Startup-Priority Inversion	Inspection	The code submitted with this DCR was inspected to verify this DCR. The updates made match the solution as documented. The scx_cpu3_dcr22677 test procedure was executed on an MCP750 running vxworks 6.4. The results of the test did not reveal any processing delays during an application's startup via command. It was also verified that the original issue documented in this DCR could not be reproduced on the MCP750 platform. This could be a result of the MCP750 processor speed, file system, and/or size and state (uncompressed vs. compressed) of the application being started in the test.
22696	ES – Allow User defined Response when an exception is caused by the OS or cFE	Test Procedure	An alternate image of the cFE was created to include a user-defined exception handler. This exception handler was executed when exceptions were generated. This was verified with the uart output captured.
22709	TBL – Update requirements to add additional Housekeeping telemetry	Inspection	The requirement text in MKS was updated as stated in the DCR
22715	Update TO_LAB to use a subscription table header file	Test Procedure	The new TO_LAB application was used for cFE 6.4.0.0 Build Verification Testing. The README file was followed and no problems were encountered during testing.
22738	CFE ES: Duplicate ID in cfe es events.h	Inspection	The duplicate Event ID was replaced with a unique ID.
22743	Table Services Decoupling	Test Procedure	An alternate image of the cFE core was built de-coupling the Table Services. The image was loaded and the cfe_no_tbl_app procedure was executed. The test log verifies that CFE_TBL was not executing. Also, the User's Guide contained information on how to remove Table Services
22751	Remove Duplicate Doxygen Documentation	Inspection	The Application Developer's Guide and Deployment Guide were removed from the User's Guide. Also, no compiler warnings were generated during the User's Guide make process.

## APPENDIX B - COMMAND, TELEMETRY, AND EVENTS VERIFICATION MATRIX

Command	Test Procedure(s)	Notes/Comments
ES_NOOP	ES_Reset	
ES_ResetCtrs	ES_Reset	
ES_ProcessorReset	ES_Logging, ES_Reset	
ES_PowerOnReset	ES_Logging, ES_Reset, ES_App_Ctrl	
ES_Shell	ES_App_Ctrl	
ES_StartApp	ES_Logging, ES_Reset, ES_App_Ctrl	
ES_DeleteApp	ES_App_Ctrl	
ES_RestartApp	ES_App_Ctrl	
ES_ReloadApp	ES_App_Ctrl	
ES_QueryApp	ES_App_Ctrl	
ES_WriteAppInfo2File	ES_App_Ctrl	
ES_ClearSysLog	ES_Logging	
ES_WriteSysLog2File	ES_Logging, ES_Reset	
ES_ClearERLog	ES_Logging	
ES_WriteERLog2File	ES_Logging, ES_Reset	
ES_StartPerf	ES_Logging	
ES_StopPerf	ES_Logging	
ES_PerfFiltrMask	ES_Logging	
ES_PerfTrigMask	ES_Logging	
ES_OverwriteSysLogMode	ES_App_Ctrl	
ES_ResetPRCnt	ES_Logging	
ES_SetMAXPRCnt	ES_Logging	
ES_DeleteCDS	ES_App_Ctrl	
ES_PoolStats	ES_App_Ctrl	
ES_WriteCDS2File	ES_App_Ctrl	
ES_WriteTaskInfo2File	ES_App_Ctrl	
EVS_NOOP	EVS_BinFilter, EVS_Cmd, EVS_Reset	
EVS_ResetCtrs	EVS_Cmd	
	ES_App_Ctrl, ES_Logging, ES_Reset, EVS_BinFilter, EVS_Cmd, EVS_Reset, EVS_EvtGen, SB_DisablePipe, SB_EnablePipe, SB_Reset, TBL_Cmd, TBL_Reset, TBL_Functionality, TIME_CmdTlm	
EVS_EnaEventType		
EVS_EnaEventTypeMask	EVS_Cmd, TIME_CmdTlm	
EVS_DisEventType	EVS_Cmd, EVS_Reset	
EVS_DisEventTypeMask	EVS_Cmd	
EVS_SetEvtFmt	EVS_Log, EVS_Reset	
	EVS_BinFilter, EVS_Cmd, EVS_EvtGen	
EVS_EnaAppEvtType		
EVS_EnaAppEvtTypeMask	EVS_Cmd	
	EVS_BinFilter, EVS_Cmd, EVS_EvtGen	
EVS_DisAppEvtType		
EVS_DisAppEvtTypeMask	EVS_Cmd	

Command	Test Procedure(s)	Notes/Comments
TIME_ResetCtrs	TIME_CmdTlm	
TIME_RequestDiag	TIME_Reset	
TIME_SetSource	TIME_CmdTlm	
TIME_SetState	TIME_CmdTlm, TIME_Reset	
TIME_AddClockLat	TIME_CmdTlm	
TIME_SubClockLat	TIME_CmdTlm	
TIME_SetClock	TIME_CmdTlm	
TIME_SetClockMET	TIME_CmdTlm	
TIME_SetClockSTCF	TIME_CmdTlm, TIME_Reset	
TIME_SetClockLeap	TIME_CmdTlm, TIME_Reset	
TIME_AddSTCFAdj	TIME_CmdTlm	
TIME_SubSTCFAdj	TIME_CmdTlm	
TIME_Add1HzSTCF	TIME_CmdTlm	
TIME_Sub1HzSTCF	TIME_CmdTlm	
TIME_StopAdd1Hz	TIME_CmdTlm	
TIME_StopSub1Hz	TIME_CmdTlm	
TIME_SetSignal	TIME_CmdTlm	

Telemetry	Test Procedure(s)	Notes/Comments
ES_CMDPC	ES_App_Ctrl, ES_Logging, ES_Reset	
ES_CMDEC	ES_App_Ctrl, ES_Logging, ES_Reset	
ES_CKSUM	ut_runproc	
ES_CFEMAJORVER	ut_runproc	
ES_CFEMINORVER	ut_runproc	
ES_CFEREVISION	ut_runproc	
ES_CFEMSNREV	ut_runproc	
ES_OSMajorVer	ut_runproc	
ES_OSMINORVER	ut_runproc	
ES_OSREVISION	ut_runproc	
ES_OSMISSIONREV	ut_runproc	
ES_SYSLOGBYTEUSED	ES_Logging, ES_Reset	
ES_SYSLOGSIZE	ES_Logging	
ES_SYSLOGENTRIES	ES_Logging, ES_Reset	
ES_SYSLOGMODE	ES_Logging	
ES_ERLOGINDEX	ES_Logging	
ES_ERLOGENTRIES	ES_Logging	
ES_RegCoreApps	ES_Reset, ES_App_Ctrl	
ES_RegExtApps	ES_Reset, ES_App_Ctrl	
ES_RegTasks	ES_Reset	
ES_RegLibs	ES_Reset	
ES_ResetType	ES_Logging; ES_Reset	
ES_ResetSubtype	ES_Logging; ES_Reset	
ES_ProcResetCnt	ES_Logging; ES_Reset	
ES_MaxProcResets	ES_Logging	
ES_BootSource	ES_Reset	
ES_PerfState	ES_Logging	
ES_PerfMode		
ES_PerfTrigCnt		

EVS_UNREGAPPC	EVS_Cmds; EVS_EvtGen	
EVS_OUTPUTPORT	EVS_Cmds; EVS_Reset	
EVS_LOGFULL	EVS_Log; EVS_Reset	
EVS_LOGMODE	EVS_BinFtr; EVS_Log; EVS_Reset	
EVS_MSGSENTC	EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Reset	
EVS_LOGOVERFLOWC	EVS_Log; EVS_Reset	
EVS_LogState		
EVS_APP.APPID	EVS_Reset	
EVS_APP.APPMSGSENTC	EVS_BinFtr; EVS_Reset	
EVS_APP.APPENASTAT	EVS_BinFtr; EVS_EvtGen; EVS_Reset	
SB_CMDPC	SB_DisablePipe; SB_Reset	
SB_CMDEC	SB_DisablePipe; SB_Reset	
SB_NoSubEC	SB_DisablePipe; SB_EnablePipe; SB_Reset	
SB_MsgSndEC	SB_DisablePipe; SB_EnablePipe	
SB_MsgRecEC	SB_DisablePipe; SB_Reset	
SB_InternalEC		
SB_NewPipeEC	SB_DisablePipe	
SB_SubscrEC	SB_Reset	
SB_DupSubCnt	SB_Reset	
SB_PipeOvrEC	SB_DisablePipe	
SB_MsgLimEC	SB_DisablePipe	
SB_MemPoolHdl		
SB_MemInUse		
SB_UnmarkedMem		
SB_Stat.SB_SMMIDIU	SB_DisablePipe	
SB_Stat.SB_SMPMIDIU	SB_DisablePipe	
SB_Stat.SB_SMMIDALW	SB_DisablePipe	
SB_Stat.SB_SMPIU	SB_DisablePipe	
SB_Stat.SB_SMPPIU	SB_DisablePipe	
SB_Stat.SB_SMMPALW	SB_DisablePipe	
SB_Stat.SB_SMBMIU	SB_DisablePipe	
SB_Stat.SB_SMPBBIU	SB_DisablePipe	
SB_Stat.SB_SMMBMALW	SB_DisablePipe	
SB_Stat.SB_SMSIU	SB_DisablePipe	
SB_Stat.SB_SMPSIU	SB_DisablePipe	
SB_Stat.SB_SMMSALW	SB_DisablePipe	
SB_Stat.SB_SMSBBIU	SB_DisablePipe	
SB_Stat.SB_SMPSBBIU	SB_DisablePipe	
SB_Stat.SB_SMMPDALW	SB_DisablePipe	

TBL_CritFlag	TBL_Functionality	
TIME_CMDPC	TIME_CmdTlm	
TIME_CMDEC	TIME_CmdTlm	
TIME_FlagSet	TIME_Reset	
TIME_FlagFly	TIME_CmdTlm; TIME_Reset	
TIME_FlagSrc		
TIME_FlagPri	cFE_AltImage	
TIME_FlagSfly	TIME_Reset	
TIME_FlagCfly	TIME_CmdTlm; TIME_Reset	
TIME_FlagAdj		
TIME_Flag1Hzd	TIME_CmdTlm	
TIME_FlagClat		
TIME_FlagSorC		
TIME_APIState	TIME_Reset	
TIME_LeapSecs	TIME_CmdTlm; TIME_Reset	
TIME_METSecs	TIME_CmdTlm	
TIME_METSubsecs	TIME_CmdTlm	
TIME_STCFSecs	TIME_Reset	
TIME_STCFSubsecs	TIME_Reset	
TIME_1HzAdjSecs	TIME_CmdTlm	
TIME_1HzAdjSSecs	TIME_CmdTlm	
TIME_DTMETS	TIME_CmdTlm	
TIME_DTMETSs		
TIME_DSTCFS	TIME_CmdTlm; TIME_Reset	
TIME_DSTCFSS	TIME_CmdTlm; TIME_Reset	
TIME_DLatentS	TIME_Reset	
TIME_DLatentSs	TIME_Reset	
TIME_DTValidS		
TIME_DTValidSs		
TIME_DLeapS	TIME_CmdTlm; TIME_Reset	
TIME_DAPIState	TIME_Reset	
TIME_DElapsedS		
TIME_DElapsedSS		
TIME_DLocalS		
TIME_DLocalSS		
TIME_DMETS	TIME_CmdTlm; TIME_Reset	
TIME_DMETSS	TIME_CmdTlm; TIME_Reset	
TIME_DTAIS	TIME_CmdTlm	
TIME_DTAISS	TIME_CmdTlm	
TIME_DUTCS	TIME_CmdTlm	
TIME_DUTCSS	TIME_CmdTlm	
TIME_DValid		
TIME_DFlywheel		
TIME_Dsource		
TIME_Dsignal		

RF.TBL_LoadBufferID	TBL_CMD, TBL_Reset, TBL_Functionality	
RF.TBL_FileCreateSeconds		
RF.TBL_FileCreateSubseconds		
RF.TBL_RegCRC		
RF.TBL_ValFuncPresent	TBL_Functionality	
RF.TBL_LoadedOnce	TBL_Functionality	
RF.TBL_UpdatePndng	TBL_Functionality	
RF.TBL_DumpOnly	TBL_Reset, TBL_Functionality	
RF.TBL_DblBuffered	TBL_Functionality	
RF.TBL_Name	TBL_CMD, TBL_Reset, TBL_Functionality	
RF.TBL_LastFileUpd	TBL_CMD, TBL_Reset, TBL_Functionality	
RF.TBL_OwnerAppName		
RF.TBL_Critical	TBL_Functionality	
SB_RouteEntry.SB_MsgId	SB_DisablePipe; SB_EnablePipe; SB_Reset	
SB_RouteEntry.SB_PipeId	SB_DisablePipe; SB_EnablePipe; SB_Reset	
SB_RouteEntry.SB_State	SB_EnablePipe; SB_Reset	
SB_RouteEntry.SB_MsgCnt	SB_DisablePipe; SB_EnablePipe;	
SB_RouteEntry.SB_AppName	SB_Reset	
SB_RouteEntry.SB_PipeName	SB_DisablePipe; SB_EnablePipe; SB_Reset	
PE.SBPF_InUse		
PE.SBPF_PipeId		
PE.SBPF_PipeName	SB_EnablePipe	
PE.SBPF_AppName		
PE.SBPF_TaskId		
PE.SBPF_SysQId		
PE.SBPF_LastSender		
PE.SBPF_Qdepth		
PE.SBPF_SendErrs		
PE.SBPF_Buffer		
SB_MsgMapEntry.SB_MM_MID		
SB_MsgMapEntry.SB_MM_INDEX		
EVS_LOG.EvtLogEntry.AppName	EVS_Log	
EVS_LOG.EvtLogEntry.EvtId	EVS_Log	
EVS_LOG.EvtLogEntry.EvtType	EVS_Log	
EVS_LOG.EvtLogEntry.ScId	EVS_Log	
EVS_LOG.EvtLogEntry.PrId	EVS_Log	
EVS_Log.EvtMsg	EVS_Log	
EVS_AppData.AppName	EVS_BinFiltr; EVS_Cmds; EVS_EvtGen; EVS_Reset	

ES_ALE.ES_AL_BSSSize	ES_App_Ctrl	
ES_ALE.ES_AL_StartAddr	ES_App_Ctrl	
ES_ALE.ES_AL_ExceptionAction	ES_App_Ctrl	
ES_ALE.ES_AL_Priority	ES_App_Ctrl	
ES_ALE.ES_AL_TaskId	ES_Logging, ES_Reset, ES_App_Ctrl	
ES_ALE.ES_AL_ExecutionCtr	ES_App_Ctrl	
ES_ALE.ES_AL_TaskName	ES_Logging, ES_Reset, ES_App_Ctrl	
ES_ALE.ES_AL_ChildTasks	ES_Reset	
ES_CDSReg.CDSHandle		
ES_CDSReg.CDSSize	ES_App_Ctrl	
ES_CDSReg.CriticalTBL	ES_Reset; TBL_Reset	
ES_CDSReg.CDSName	ES_App_Ctrl; TBL_Reset	
ES_TL.TaskId	ES_App_Ctrl	
ES_TL.ExecutionCtr		
ES_TL.TaskName	ES_App_Ctrl	
ES_TL.AppId	ES_App_Ctrl	
ES_TL.AppName	ES_App_Ctrl	

Id	Event Message	Test Procedure(s)	Notes/Comments
1	CFE_ES_INIT_INF_EID	Generated at cFE Startup	
2	CFE_ES_INITSTATS_INF_EID	Generated at cFE Startup	
3	CFE_ES_NOOP_INF_EID	ES_Reset; EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Reset	
4	CFE_ES_RESET_INF_EID	ES_Reset	
5	CFE_ES_SHELL_INF_EID	ES_AppCtrl	
6	CFE_ES_START_INF_EID	ES_AppCtrl; ES_Logging; ES_Reset; EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Log; EVS_Reset; SB_DisablePipe; SB_EnablePipe; SB_Reset; TBL_Cmd; TBL_Functionality; TBL_Reset; TIME_CmdTlm; TIME_Reset	
7	CFE_ES_STOP_DBG_EID	ES_AppCtrl; ES_Logging; TBL_Functionality; TBL_Reset;	
8	CFE_ES_STOP_INF_EID	ES_AppCtrl; ES_Logging; TBL_Functionality; TBL_Reset;	
9	CFE_ES_RESTART_APP_DBG_EID	ES_AppCtrl	
10	CFE_ES_RESTART_APP_INF_EID	ES_AppCtrl; ES_Logging;	
11	CFE_ES_RELOAD_APP_DBG_EID	ES_AppCtrl	
12	CFE_ES_RELOAD_APP_INF_EID	ES_AppCtrl	
13	CFE_ES_EXIT_APP_INF_EID		
14	CFE_ES_ERREXIT_APP_INF_EID		
15	CFE_ES_ONE_APP_EID	ES_AppCtrl	



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Id	Event Message	Test Procedure(s)	Notes/Comments
62	CFE_ES_PERF_STOPCMD_ERR2_EID		
63	CFE_ES_PERF_FILTMSKCMD_EID	ES_Logging;	
64	CFE_ES_PERF_FILTMSKERR_EID		
65	CFE_ES_PERF_TRIGMSKCMD_EID	ES_Logging;	
66	CFE_ES_PERF_TRIGMSKERR_EID		
67	CFE_ES_PERF_LOG_ERR_EID	ES_Logging;	
68	CFE_ES_PERF_DATAWRITTEN_EID	ES_Logging;	
69	CFE_ES_CDS_REGISTER_ERR_EID		
70	CFE_ES_SYSLOGMODE_EID	ES_AppCtrl; ES_Logging;	
71	CFE_ES_ERR_SYSLOGMODE_EID		
72	CFE_ES_RESET_PR_COUNT_EID	ES_Logging;	
73	CFE_ES_SET_MAX_PR_COUNT_EID	ES_Logging;	
74	CFE_ES_FILEWRITE_ERR_EID		
75	CFE_ES_RST_ACCESS_EID		
76	CFE_ES_CDS_DELETE_ERR_EID		
77	CFE_ES_CDS_NAME_ERR_EID	ES_AppCtrl	
78	CFE_ES_CDS_DELETED_INFO_EID	ES_AppCtrl	
79	CFE_ES_CDS_DELETE_TBL_ERR_EID	ES_AppCtrl	
80	CFE_ES_CDS_OWNER_ACTIVE_EID	ES_AppCtrl	
81	CFE_ES_TLM_POOL_STATS_INFO_EID	ES_AppCtrl	
82	CFE_ES_INVALID_POOL_HANDLE_ERR_EID	ES_AppCtrl	
83	CFE_ES_CDS_REG_DUMP_INF_EID	ES_AppCtrl; TBL_Reset;	
84	CFE_ES_CDS_DUMP_ERR_EID		
85	CFE_ES_WRITE_CFE_HDR_ERR_EID		
86	CFE_ES_CREATING_CDS_DUMP_ERR_EID	ES_AppCtrl;	
87	CFE_ES_TASKINFO_EID	ES_AppCtrl;	
88	CFE_ES_TASKINFO_OSCREATE_ERR_EID	ES_AppCtrl;	
89	CFE_ES_TASKINFO_WRHDR_ERR_EID		
90	CFE_ES_TASKINFO_WR_ERR_EID		
0	CFE_EVS_NOOP_EID	EVS_BinFiltr; EVS_Cmds; EVS_EvtGen; EVS_Reset	
1	CFE_EVS_STARTUP_EID		
2	CFE_EVS_ERR_WRLOGFILE_EID		
3	CFE_EVS_ERR_CRLOGFILE_EID	EVS_Log	
5	CFE_EVS_ERR_MSGID_EID		
6	CFE_EVS_ERR_EVTIDNOREGS_EID	EVS_BinFiltr; EVS_Cmds; EVS_EvtGen; SB_DisablePipe; SB_Reset;	
7	CFE_EVS_ERR_APPNOREGS_EID		
8	CFE_EVS_ERR_ILLAPPIDRANGE_EID		
9	CFE_EVS_ERR_NOAPPIDFOUND_EID	EVS_Cmds; EVS_EvtGen;	
10	CFE_EVS_ERR_ILLEGALFMTMOD_EID		
11	CFE_EVS_ERR_MAXREGSFILTER_EID	EVS_BinFiltr	
12	CFE_EVS_ERR_WRDATFILE_EID		
13	CFE_EVS_ERR_CRDATFILE_EID	EVS_Cmds	
15	CFE_EVS_ERR_CC_EID		
16	CFE_EVS_RSTCNT_EID		
17	CFE_EVS_SETFILTERMSK_EID	EVS_BinFiltr; EVS_EvtGen	
18	CFE_EVS_ENAPORT_EID	EVS_Cmds; EVS_Reset;	
19	CFE_EVS_DISPORT_EID	EVS_Cmds; EVS_Reset;	

Id	Event Message	Test Procedure(s)	Notes/Comments
5	CFE_SB_PIPE_ADDED_EID	ES_AppCtrl; ES_Logging; ES_Reset; EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Reset; SB_DisablePipe; SB_EnablePipe; SB_Reset; TBL_Cmd; TBL_Functionality; TBL_Reset;	
6	CFE_SB_SUB_ARG_ERR_EID		
7	CFE_SB_DUP_SUBSCRIP_EID	ES_Logging; SB_Reset; TBL_Functionality;	
8	CFE_SB_MAX_MSGS_MET_EID	SB_DisablePipe;	
9	CFE_SB_MAX_DESTS_MET_EID	ES_AppCtrl; SB_DisablePipe; SB_EnablePipe; SB_Reset;	
10	CFE_SB_SUBSCRIPTION_RCVD_EID	ES_AppCtrl; ES_Logging; ES_Reset; EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Reset; SB_DisablePipe; SB_EnablePipe; SB_Reset; TBL_Cmd; TBL_Functionality; TBL_Reset;	
11	CFE_SB_UNSUB_ARG_ERR_EID		
12	CFE_SB_UNSUB_NO_SUBS_EID	SB_Reset	
13	CFE_SB_SEND_BAD_ARG_EID		
14	CFE_SB_SEND_NO_SUBS_EID	ES_AppCtrl; SB_EnablePipe; SB_CmdsErr; SB_EnablePipe; SB_Reset	
15	CFE_SB_MSG_TOO_BIG_EID	SB_CmdsErr; SB_DisablePipe; SB_EnablePipe	
16	CFE_SB_GET_BUF_ERR_EID		
17	CFE_SB_MSGID_LIM_ERR_EID	ES_AppCtrl; ES_Logging; SB_DisablePipe; SB_EnablePipe	
18	CFE_SB_RCV_BAD_ARG_EID	SB_DisablePipe; SB_Reset;	
19	CFE_SB_BAD_PIPEID_EID	SB_EnablePipe;	
20	CFE_SB_DEST_BLK_ERR_EID		
21	CFE_SB_SEND_INV_MSGID_EID		
22	CFE_SB_SUBSCRIPTION_RPT_EID		
24	CFE_SB_UNSUBSCRIPTION_RPT_EID		
25	CFE_SB_Q_FULL_ERR_EID	SB_DisablePipe	
26	CFE_SB_Q_WR_ERR_EID		
27	CFE_SB_Q_RD_ERR_EID		
28	CFE_SB_CMD0_RCVD_EID	EVS_BinFtr; EVS_Cmds; EVS_EvtGen; EVS_Reset; SB_CmdsErr; SB_EnablePipe;	
29	CFE_SB_CMD1_RCVD_EID	SB_DisablePipe	
30	CFE_SB_LSTSNDER_ERR1_EID		
31	CFE_SB_LSTSNDER_ERR2_EID		
32	CFE_SB_SND_STATS_EID	SB_DisablePipe; SB_EnablePipe	
33	CFE_SB_ENBL_RTE1_EID	SB_CmdsErr; SB_EnablePipe	
34	CFE_SB_ENBL_RTE2_EID	SB_DisablePipe; SB_EnablePipe	

Id	Event Message	Test Procedure(s)	Notes/Comments
35	CFE_TBL_LOAD_SUCCESS_INF_EID	ES_AppCtrl; TBL_Cmd; TBL_Functionality; TBL_Reset;	
36	CFE_TBL_VALIDATION_INF_EID	TBL_Cmd; TBL_Functionality; TBL_Reset	
37	CFE_TBL_UPDATE_SUCCESS_INF_EID	TBL_Cmd; TBL_Functionality; TBL_Reset	
38	CFE_TBL_CDS_DELETED_INFO_EID	TBL_Reset;	
50	CFE_TBL_MID_ERR_EID		
51	CFE_TBL_CC1_ERR_EID	EVS_EvtGen; EVS_Cmds; TBL_Cmd;	
52	CFE_TBL_LEN_ERR_EID		
53	CFE_TBL_FILE_ACCESS_ERR_EID	TBL_Cmd; TBL_Functionality	
54	CFE_TBL_FILE_STD_HDR_ERR_EID		
55	CFE_TBL_FILE_TBL_HDR_ERR_EID		
56	CFE_TBL_FAIL_HK_SEND_ERR_EID		
57	CFE_TBL_NO_SUCH_TABLE_ERR_EID	TBL_Functionality; TBL_Reset	
58	CFE_TBL_FILE_TYPE_ERR_EID		
59	CFE_TBL_FILE_SUBTYPE_ERR_EID		
60	CFE_TBL_NO_WORK_BUFFERS_ERR_EID	TBL_Functionality	
61	CFE_TBL_INTERNAL_ERROR_ERR_EID		
62	CFE_TBL_CREATING_DUMP_FILE_ERR_EID	TBL_Functionality	
63	CFE_TBL_WRITE_CFE_HDR_ERR_EID		
64	CFE_TBL_WRITE_TBL_HDR_ERR_EID		
65	CFE_TBL_WRITE_TBL_IMG_ERR_EID		
66	CFE_TBL_NO_INACTIVE_BUFFER_ERR_EID	TBL_Functionality	
67	CFE_TBL_TOO_MANY_VALIDATIONS_ERR_EID		
68	CFE_TBL_WRITE_TBL_REG_ERR_EID		
69	CFE_TBL_LOAD_ABORT_ERR_EID		
70	CFE_TBL_ACTIVATE_ERR_EID	TBL_Cmd; TBL_Functionality	
71	CFE_TBL_FILE_INCOMPLETE_ERR_EID		
72	CFE_TBL_LOAD_EXCEEDS_SIZE_ERR_EID	TBL_Cmd; TBL_Functionality	
73	CFE_TBL_ZERO_LENGTH_LOAD_ERR_EID		
74	CFE_TBL_PARTIAL_LOAD_ERR_EID		
75	CFE_TBL_FILE_TOO_BIG_ERR_EID	TBL_Cmd	
76	CFE_TBL_TOO_MANY_DUMPS_ERR_EID		
77	CFE_TBL_DUMP_PENDING_ERR_EID		
78	CFE_TBL_ACTIVATE_DUMP_ONLY_ERR_EID	TBL_Functionality	
79	CFE_TBL_LOADING_A_DUMP_ONLY_ERR_EID	TBL_Functionality	
80	CFE_TBL_ILLEGAL_BUFF_PARAM_ERR_EID	TBL_Functionality;	
81	CFE_TBL_UNVALIDATED_ERR_EID	TBL_Functionality	
82	CFE_TBL_IN_REGISTRY_ERR_EID	TBL_Reset	
83	CFE_TBL_NOT_CRITICAL_TBL_ERR_EID		
84	CFE_TBL_NOT_IN_CRIT_REG_ERR_EID	TBL_Reset	
85	CFE_TBL_CDS_NOT_FOUND_ERR_EID		
86	CFE_TBL_CDS_DELETE_ERR_EID		
87	CFE_TBL_CDS_OWNER_ACTIVE_ERR_EID	TBL_Reset	
88	CFE_TBL_LOADING_PENDING_ERR_EID		
89	CFE_TBL_FAIL_NOTIFY_SEND_ERR_EID		
90	CFE_TBL_REGISTER_ERR_EID	TBL_Functionality; TBL_Reset	
91	CFE_TBL_SHARE_ERR_EID		
92	CFE_TBL_UNREGISTER_ERR_EID		