

FM Requirements to Design Traceability

FM Version 2.6.0

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| **Requirement Number** | **Requirement Text** | **Software Design Element** | **Applicable Software Functions** | |
| FM1000 | Upon receipt of a No-Op command, FM shall increment the Valid Command Counter and generate an event message. | Execution | FM\_NoopCmd | |
| FM1001 | Upon receipt of a Reset Counters command, FM shall reset the following housekeeping variables to a value of zero:   a) Valid Command Counter   b) Command Rejected Counter | Execution | FM\_ResetCountersCmd | |
| FM1002 | If the computed length of any FM command is not equal to the length contained in the message header, FM shall reject the command | Execution | FM\_IsValidCmdPktLength  FM\_NoopCmd  FM\_ResetCountersCmd  FM\_CopyFileCmd  FM\_MoveFileCmd  FM\_RenameFileCmd  FM\_DeleteFileCmd  FM\_DeleteAllFilesCmd  FM\_DecompressFileCmd  FM\_ConcatFilesCmd  FM\_GetFileInfoCmd  FM\_GetOpenFilesCmd  FM\_CreateDirectoryCmd  FM\_DeleteDirectoryCmd  FM\_GetDirListFileCmd  FM\_GetDirListPktCmd  FM\_GetFreeSpaceCmd  FM\_SetTableStateCmd  FM\_DeleteFileCmd  FM\_SetPermissionsCmd | |
| FM1003 | If FM accepts any command as valid, FM shall execute the command, increment the FM Valid Command Counter and issue an event message | Execution | FM\_ProcessCmd | |
| FM1004 | If FM rejects any command, FM shall abort the command execution, increment the FM Command Rejected Counter and issue an error event message | Execution | FM\_ProcessCmd | |
| FM1005 | If the filename specified in any FM command is not valid, FM shall reject the command | Execution | FM\_CopyFileCmd  FM\_MoveFileCmd  FM\_RenameFileCmd  FM\_DeleteFileCmd  FM\_DecompressFileCmd  FM\_ConcatFilesCmd  FM\_GetFileInfoCmd  FM\_SetPermissionsCmd | |
| FM1006 | If the directory specified in any FM command is not valid, FM shall reject the command | Execution | FM\_DeleteAllFilesCmd  FM\_CreateDirectoryCmd  FM\_DeleteDirectoryCmd  FM\_GetDirListFileCmd  FM\_GetDirListPktCmd | |
| FM1008 | The CFS FM FSW shall utilize full path specifications having a maximum length of <PLATFORM\_DEFINED> characters for all command input arguments requiring a file or pathname. | Execution | FM\_CopyFileCmd\_t  FM\_MoveFileCmd\_t  FM\_RenameFileCmd\_t  FM\_DeleteFileCmd\_t  FM\_DeleteAllCmd\_t  FM\_DecompressCmd\_t  FM\_ConcatCmd\_t  FM\_GetFileInfoCmd\_t  FM\_CreateDirCmd\_t  FM\_DeleteDirCmd\_t  FM\_GetDirFileCmd\_t  FM\_GetDirPktCmd\_t  FM\_SetPermCmd\_t | |
| FM1009 | Upon receipt of the Set Table Entry State Command, FM will set the enable/disable state for the specified entry in the File System Free Space Table. | Execution | FM\_SetTableStateCmd | |
| FM1009.1 | If the File System Free Space table has not been loaded FM will reject the command and send an event message | Execution | FM\_SetTableStateCmd  CFE\_EVS\_SendEvent | |
| FM1009.2 | If the command-specified entry in the File System Free Space Table is invalid FM will reject the command and send an event message | Execution | FM\_SetTableStateCmd  CFE\_EVS\_SendEvent | |
| FM1009.3 | If the command-specified state is invalid FM will reject the command and send an event message | Execution | FM\_SetTableStateCmd  CFE\_EVS\_SendEvent | |
| FM1009.4 | If the command-specified entry in the File System Free Space Table is unused FM will reject the command and send an event message | Execution | FM\_SetTableStateCmd  CFE\_EVS\_SendEvent | |
| FM2002 | Upon receipt of a File Copy command, FM shall copy the command-specified file to the command-specified destination file | Execution | FM\_CopyFileCmd  FM\_ChildCopyCmd | |
| FM2002.1 | If the command-specified destination file exists and the command-specified overwrite flag is set to FALSE, FM shall reject the command | Execution | FM\_CopyFileCmd  FM\_VerifyOverwrite  FM\_VerifyFileNoExist | |
| FM2004 | Upon receipt of a Move command, FM shall move the command-specified file to the command-specified destination file. | Execution | FM\_MoveFileCmd  FM\_ChildMoveCmd | |
| FM2004.1 | If the command-specified destination file exists and the command-specified overwrite flag is set to FALSE, FM shall reject the command | Execution | FM\_MoveFileCmd  FM\_VerifyOverwrite  FM\_VerifyFileNoExist | |
| FM2005 | Upon receipt of a Rename command, FM shall rename the command-specified file to the command-specified destination file. | Execution | FM\_RenameFileCmd  FM\_ChildRenameCmd |
| FM2005.1 | If the command-specified destination file exists, FM shall reject the command. | Execution | FM\_RenameFileCmd  FM\_VerifyFileNoExist | |
| FM2007 | Upon receipt of a Delete All Files command, FM shall delete all the files in the command-specified directory | Execution | FM\_DeleteAllFilesCmd  FM\_ChildDeleteAllCmd | |
| FM2007.1 | If the command-specified directory contains an open file, FM shall not delete the open file. | Execution | FM\_DeleteAllFilesCmd  FM\_ChildDeleteAllCmd  FM\_GetFilenameState | |
| FM2007.1.1 | For any open files that are not deleted, FM shall issue one event message. | Execution | FM\_DeleteAllFilesCmd  FM\_ChildDeleteAllCmd  FM\_GetFilenameState  CFE\_EVS\_SendEvent | |
| FM2007.2 | If the command-specified directory contains a subdirectory, FM shall not delete the subdirectory | Execution | FM\_DeleteAllFilesCmd  FM\_ChildDeleteAllCmd  FM\_GetFilenameState | |
| FM2007.2.1 | For any subdirectories are not deleted, FM shall issue one event message. | Execution | FM\_DeleteAllFilesCmd  FM\_ChildDeleteAllCmd  FM\_GetFilenameState  CFE\_EVS\_SendEvent | |
| FM2008 | Upon receipt of a Delete command, FM shall delete the command-specified file. | Execution | FM\_DeleteFileCmd  FM\_ChildDeleteCmd | |
| FM2008.1 | If the command-specified file is open, FM shall reject the command to delete the file. | Execution | FM\_DeleteFileCmd  FM\_VerifyFileClosed | |
| FM2008.2 | If the command-specified file is a directory, FM shall reject the command | Execution | FM\_DeleteFileCmd  FM\_VerifyFileClosed | |
| FM2009 | Upon receipt of a Decompress command, FM shall decompress the command-specified file to the command-specified file. | Execution | FM\_DecompressFileCmd  FM\_ChildDecompressCmd  FS\_LIB\_Decompress | |
| FM2009.1 | If the command-specified destination file exists, FM shall reject the command | Execution | FM\_DecompressFileCmd  FM\_VerifyFileNoExist | |
| FM2010 | Upon receipt of a Concatenate command, FM shall concatenate the command-specified file with the second command-specified file, copying the result to the command-specified destination file. | Execution | FM\_ConcatFilesCmd  FM\_ChildConcatCmd | |
| FM2010.1 | If the command-specified destination file exists, FM shall reject the command | Execution | FM\_ConcatFilesCmd  FM\_VerifyFileNoExist | |
| FM2011 | Upon receipt of a File Info command, FM shall generate a message containing the following for the command-specified "file:"  a) the file size,  b) last modification time,  c) file status (Open, Closed, or Non-existent)  d) <MISSION\_DEFINED> CRC  e) the file mode (permissions), as a 4-byte value  f) command-specified filename | Execution | FM\_GetFileInfoCmd  FM\_ChildFileInfoCmd  CFE\_SB\_TransmitMsg | |
| FM2012 | Upon receipt of a List Open Files command, FM shall generate a message containing:  a) the number of open files   b) Up to <PLATFORM\_DEFINED> names/paths (of each open file) and the application name that has opened the file | Execution | FM\_GetOpenFilesCmd  CFE\_SB\_TransmitMsg | |
| FM2013 | Upon receipt of a Set File Permissions command, FM shall set the command-specified file's permissions to the command-specified mode.  Note: The mode is defined as a 4-byte value | Execution | FM\_SetPermissionsCmd  FM\_ChildSetPermissionsCmd | |
| FM3000 | Upon receipt of a Create Directory command, FM shall create the command-specified directory on the command-specified filesystem | Execution | FM\_CreateDirectoryCmd  FM\_ChildCreateDirCmd | |
| FM3001 | Upon receipt of a Delete command, FM shall remove the command-specified directory from the command-specified filesystem. | Execution | FM\_DeleteDirectoryCmd  FM\_ChildDeleteDirCmd | |
| FM3001.1 | If the specified directory contains at least one file or subdirectory, the command shall be rejected | Execution | FM\_ChildDeleteDirCmd | |
| FM3002 | Upon receipt of a Directory Listing To File command, FM shall write the contents of the command-specified directory on any of the on-board file systems to the command-specified file. The following shall be written:   a) Directory name   b) file size in bytes of each file   c) last modification time of each file   d) Filename of each file  e) Mode (permissions), as a 4-byte value, of each file | Execution | FM\_GetDirListFileCmd  FM\_ChildDirListFileCmd  FM\_ChildDirListFileInit  FM\_ChildDirListFileLoop | |
| FM3002.1 | FM shall issue an event message that reports:   a) The number of filenames written to the specified file   b) The total number of files in the directory   c) The command-specified file’s filename | Execution | FM\_ChildDirListFileLoop | |
| FM3002.2 | FM shall use the <PLATFORM\_DEFINED> default filename if a file is not specified | Execution | FM\_GetDirListFileCmd | |
| FM3002.3 | If the command-specified GetSizeTimeMode flag is set to FALSE, FM shall initialize the following values to Zero:  b) file size in bytes of each file  c) last modification time of each file  e) Mode (permissions), as a 4-byte value, of each file   Note: the lettering of the listed values is kept in sync with parent requirement | Execution | FM\_ChildDirListFileLoop  FM\_ChildSleepStat | |
| FM3003 | Upon receipt of a Directory Listing command, FM shall generate a message containing the following for up to <PLATFORM\_DEFINED> consecutive files starting at the command specified offset:   a) Directory name   b) file size in bytes of each file   c) last modification time of each file   d) Filename of each file  e) Mode (permissions), as a 4-byte value, of each file | Execution | FM\_GetDirListPktCmd  FM\_ChildDirListPktCmd | |
| FM3003.1 | If the command-specified GetSizeTimeMode flag is set to FALSE, FM shall initialize the following values to Zero:  b) file size in bytes of each file  c) last modification time of each file  e) Mode (permissions), as a 4-byte value, of each file   Note: the lettering of the listed values is kept in sync with parent requirement | Execution | FM\_ChildDirListPktCmd  FM\_ChildSleepStat | |
| FM4000 | FM shall generate a housekeeping message containing the following:   a) Valid Command Counter   b) Command Rejected Counter   c) Total number of open files | Execution | FM\_ReportHK  CFE\_SB\_TransmitMsg | |
| FM4001 | Upon receipt of a Report Device Free Space command, FM shall generate a message containing for each enabled device in the FM device table the amount of available free space. | Execution | FM\_GetFreeSpaceCmd  CFE\_EVS\_SendEvent | |
| FM5000 | Upon initialization of the FM Application, FM shall initialize the following data to Zero   a) Valid Command Counter   b) Command Rejected Counter | Initialization | FM\_AppInit | |