

WEC INSTRUMENT USER MANUAL

CHAPTER 7

CRITICAL OPERATIONS

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Acronyms

See Chapter 1.

7.1 DANGEROUS COMMANDS

The following commands are "dangerous", and should not be sent accidentally: Deployment power should be switched off at spacecraft LCL except during deployment operations

To EFW

MOTOR
DEP_STOP
DEP_A
DEP_B
DEP_BOTH
DEP_OVER
DEP_PAIR
SCVMODE

To WHISPER

TS WHISPER ON before first boom deployment

(ie ZEWMSS2FS with parameter 0x45)

WHI S/W UP_LOAD prohibited in flight.(Ground operation only)

7.2 SHORT ECLIPSES

The NBR SPIN SYNCHRONISED (NMSY, NMLC) and HBR SPIN SYNCHRONISED (BMSY, BMLC) modes, which requires a sun reference pulse (SRP) may not be used during eclipses.

The particle correlator may not be used during eclipses. If the correlator is on when the spacecraft is approaching eclipse, the command ZEWMSEDFS with parameter 0x00 should be sent to turn it off. It is expected that this situation will be handled at JSOC level by defining eclipse versions of the standard operations modes.

7.3 LONG ECLIPSES

No WEC modes will be operated during the long eclipses.

7.4 PERIGEE PASSAGES

WEC should remain on during perigee passes. For WEC the main concern is the increased strength of the earth's magnetic field which causes a large spin frequency output from the search coil (STAFF SC) antennas. This can cause numerical saturation in the standard data compression algorithm. STAFF SC shall use the 'backup' algorithm when the spacecraft is within 3 hours of perigee. This is implemented at JSOC level by defining special perigee modes.

7.5 MANOEUVRES

No special requirement.

7.6 PATCHING S/W

It is not planned that patching software will be used in normal operation. In the event that any is needed it will be described and requested when the need is identified. The first time that this may be likely is when one spacecraft has been fully tested during commissioning phase. A further time may be after the commissioning phase or in the event of some failure or error discovery.

For use during commissioning EFW has a patch known as the Sweep Diagnostic Tool. This is loaded from a standard command sequence in procedure FCP_WEC_CA15.

7.7 TIME CRITICAL COMMANDS

EFW has no commands which require that they be sent within a certain maximum time from each other. However, no EFW commands should be sent before 16 seconds have elapsed after the following commands:

EFW power on

MRESET.

After a DWP power on or reset DWP will execute an internal macro sequence, NBR emergency and default, if no telecommands have been received on either OBDH interface after counting 20 OBDH reset pulses, a period of approximately 120 seconds. To prevent the macro starting a NOP (ZEWMS5FS) may be sent.

DWP can accept bursts of commands (from OBDH macros, or timetag commands with the same execution time) only when the kernel processor is at full speed, STAFF SC data acquisition is disabled and the correlator is off. During nominal operations only the STANDBY mode satisfies these conditions. Otherwise commands must be sent individually (each timetag command with a separate execution time).

All these time criticalities are taken care of by including suitable delays in the procedures and command sequences.