PFR-237 Title: Limit Monitor Warm Reset

Assembly: BAU	**SubAssembly :** FSW	
Component :	**Units Affected:**	**Units fixed:**
Originator: Mark Lewis	- - - - - -	- - - - - - -
Organization: UCB	**Date:** 12/16/06 (date found)	
Phone:	**Email :** markl@ssl.berkeley.edu	

Failure Occurred During (Check one √)

√ Functional test □ Qualification test □ S/C Integration □ Launch operations □ Other (Flight Assy)

Environment when failure occurred:

√ Ambient	□ Vibration	□ Shock	□ Acoustic
□ Thermal	□ Vacuum	□ Thermal-Vacuum	□ EMI/EMC

Problem Description

Mark Lewis E-mail; Sent: Thursday, December 21, 2006 6:22 PM; Subject: Limit monitor warm reset:

"In the last two days we have been working on some maneuver sims, using the flatsat. The testing included setting up limit monitors to guard against maneuvers gone bad. New limit monitors were loaded in using the /clmjamlim command. This is something we've done many times in the past, during our testing. But once last night, and again today, we had a spontaneous BAU warm reset, upon using the command. In each case, global limit monitoring was enabled, when the command was sent"….

…"The particular limit monitors being loaded are new, but function properly when a warm reset does not occur (have loaded them multiple times now, and only had resets twice). They are looking at the spin rate high/low and sun angle high/low flags set in the MSSS Status word"…

Analyses Performed to Determine Cause

On 12/22/06, the event files from the two events and the procedure that caused the warm reset were sent to Hammers for further diagnosis.

From Chris Xenophontos at Hammers:

There are 5 conditions that will cause an autonomous WARM_RESET:
1. CPU Hogging
2. Critical Task Checkin Failure
3. SRAM Checksum miscompare
4. Stored command Checksum miscompare
5. Code Segments Checksum miscompare

Since the Warm Reset is intermittent when executing the same command over and over, it NOT likely conditions 3-5. CX suggests that a CPU Hogging or Task Checking Failure condition is being created when the command is entered.

Corrective Action/ Resolution

Although this PFR is still being investigated to determine exact cause, it can be closed with two viable work-arounds. The first work around is to disable global limit monitoring when using the /clmjamlim command. This was tried, the command sent multiple, multiple times and no warm reset occurred.

However, since it is not completely conclusive that this will **always** work, another work-around is to not use the /clmjamlim command at all and simply upload a completely new table with the correct limit monitors. The procedure to upload tables has been tested numerous times and has never shown any problems.

Finally, note that the FSW is designed to "fly through" a warm reset, meaning that all previous conditions prior to the reset are matched after the reset. Therefore, a warm reset on orbit would not have an adverse affect on the probe in any way other than stopping nominal operator activities planned for that pass.

Acceptance:
MAM: Ron Jackson_____; MSE: Ellen Taylor_____

PM: Peter Harvey_____; Cognizant Engineer_____

Date of Closure_____