

Attachment 3

to the Human Performance Group Chairman's Factual Report

DCA15MA019

Information to Pilots about Feather Lock Loads

From: Scot Story

Sent: Thursday, July 08, 2010 9:54 AM

To: Bob Waldmiller; Burt Rutan; Joseph Ruddy; Mike Alsbury; Rick Aldrich; Doug Shane; Peter Siebold; Ben Diachun

Cc: Jim Tighe; Matthew Stinemetze; Aaron Cassebeer

Subject: RE: FRR items

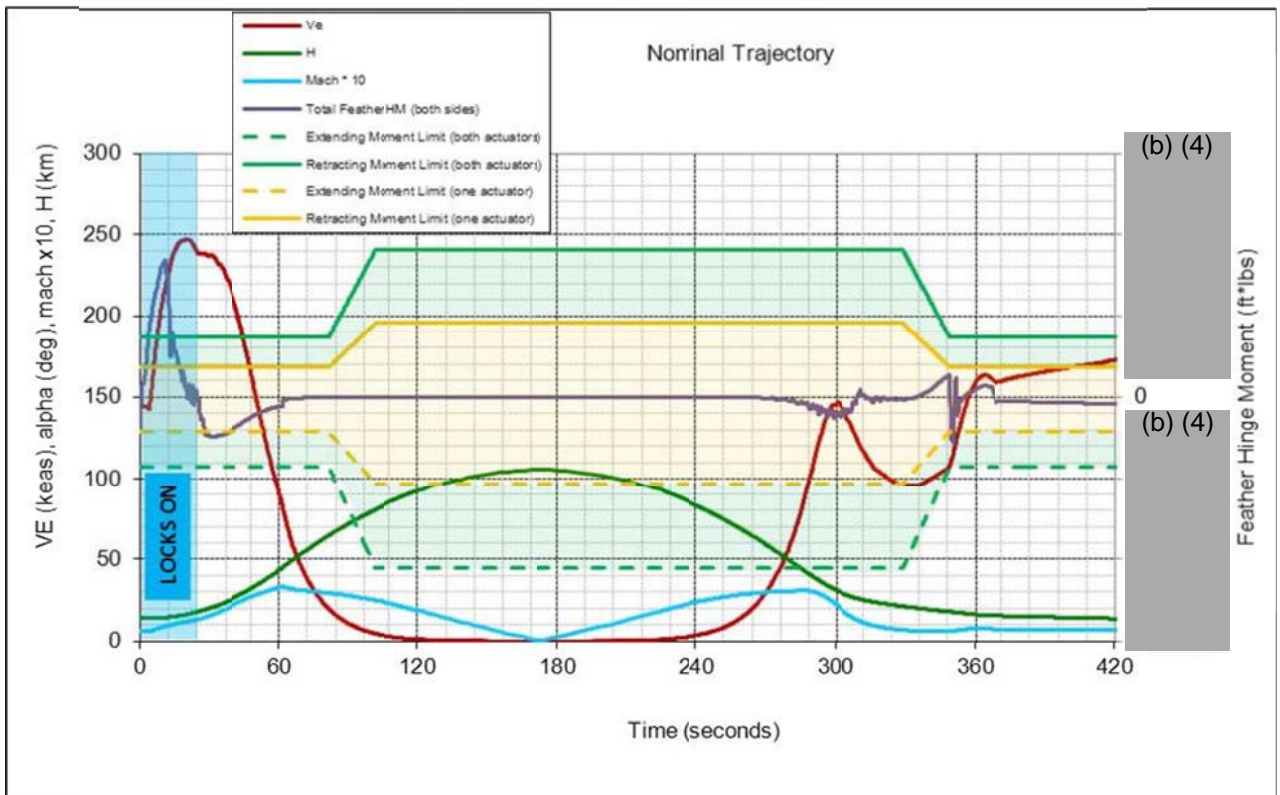
Bob,

The damage issue came about when the actuators were actuated against each other because the linkage to one of the valves was disconnected. The system was never designed for this type of case. If it is now a requirement that the actuators fight each other or there is a jam in the system, then the system will need to be replaced. This is not currently planned.

The other issue is the stiffness of the system. Because of the stretch in the cables, actuating the system with one actuator causes the un-actuated hook to not be fully closed when the actuated hook hits its stop. This should improve as the cables tighten with decreasing temperatures. In addition, assuming two functional feather actuators, the tail loads are not enough to open the feather even if the hooks were not engaged except during the pull-up portion of the boost phase. With that in mind, if we are opening the hook right after the pull-up, and assuming there is enough time to abort if a lock doesn't open, it could be argued that we don't need the interconnect at all.

Scot

Nominal Boost Trajectory Feather HM



(b) (4)
0
(b) (4)

Feather Hinge Moment (ft*lbs)



Fault Tree Analysis SS2 Feather



Item #	Function	Failure Condition	Phase	Class	Failure Rate
13.01	Provide Feather Configuration	Feather Fails to Operate	Entry	Catastrophic	<p>(b) (4) An actuator jam is the most likely failure</p> <p>(b) (4) Mitigated with unlock of feather at boost and abort ability. This take 2 possible actuator jams out of the loop</p>
13.02	Provide Feather Configuration	Uncommanded Feather Operation	Boost	Catastrophic	<p>(b) (4) This assumes the feather has been unlocked, so only the feather actuation has to fail uncommanded.</p>
13.03	Provide Feather Configuration	Uncommanded Feather Operation	Landing	Catastrophic	<p>(b) (4) Both locks and feather would have to fail uncommanded.</p>