



NATIONAL TRANSPORTATION SAFETY BOARD

Office of Aviation Safety
Washington, D.C. 20594

February 27, 2015

Attachment 12 – Pilot SS2 Training

OPERATIONAL FACTORS

DCA15MA019

SIMULATOR TRAINING EVENT RECORD			
1. NAME	2. AIRCRAFT SpaceShipTwo	3. CREW POSITION PILOT	4. TYPE OF TRAINING PIC – Experimental Authorization (EA)

TRAINING EVENTS	Qty Req	# and DATE1	# and DATE2	# and DATE3
GENERAL				
a) Simulator Training Events				
a) Basic familiarization and FQ (glide)	3			
b) Approaches (nominal wt/CG and positioning)	12			
c) Off nominal (high and low energy starts @ HK360°)	12			
d) Opposite-side “on the blue line” approach setups (e.g. north of the field until on the 180° energy line for HK360 RWY30 approach)	3			
e) Abort landing (heavy weight / aft CG)	6			
f) Divert operations / late runway changes (cardioid, APPR, etc.)	3			
g) Approach – Low ceiling (<300 ft AGL)	2			
h) Powered flight (nominal burn)	3			
i) PSC disabled burn (prior to gamma turn)	1			
j) Stab trim failures	2			
k) Roll boost failures	2			
l) Flutter procedures (boost and glide)	2			
m) Out of control flight (boost)	1			
n) Out of control flight (glide)	2			
o) RM2 dump/vent malfunctions	2			
p) Overweight/forced landing	2			
q) Electrical failures	2			
r) DAU failures	2			
s) Feather fails to raise / lower	2			
t) Feather fails to unlock / lock	2			
u) Feather down reentry	2			
v) Premature release (broken arrow)	1			
w)				
x)				
y)				
z)				

SS2 SPACECRAFT TRAINING EVENT ACCOMPLISHMENT

Date: 19 December 2013	Instructor Stucky	Training duration (HH:MM) 02:00
Attendees: Mackay, David Masucci, Mike		
Training Accomplished: In depth look at SS2 pneumatic and electrical systems, displays, and finer points of normal and emergency procedures.		
INSTRUCTOR'S SIGNATURE --signed electronically—Mark P. Stucky		DATE 19 Dec 2013

Date:	Instructor	Training duration (HH:MM)
Attendees:		
Training Accomplished:		
INSTRUCTOR'S SIGNATURE		DATE

SIMULATOR TRAINING EVENT RECORD			
1. NAME	2. AIRCRAFT SpaceShipTwo	3. CREW POSITION PILOT	4. TYPE OF TRAINING PIC – Experimental Authorization (EA)

TRAINING EVENTS	Qty Req	# and DATE1	# and DATE2	# and DATE3
b) Glide flight (nominal CG)	1			
a) Release	1			
b) 3-axis doublets @ 150 KEAS	1			
c) Approach to stall (CG considerations)	1			
d) Steady Heading (track) Sideslips (roll boost OFF, then roll boost ON)	1			
e) High q flight (250 – 300 KEAS)	1			
f) Maneuvering flight pull-up (3.5g ± 0.2g)	1			
g) Maneuvering flight pushover (-0.5g ± 0.2g)	1			
h) Wind up turn @ 200 KEAS	1			
i) Bank capture tasks (45° - 45°) (roll boost OFF, then ON)	1			
j) Simulated flare with speedbrake	1			
k) Energy management to high key	1			
l) Approach and landing	1			
c) Glide flight (abort weight / CG)	1			
a) Release	1			
b) 3-axis doublets @ 150 KEAS	1			
c) Approach to stall (CG considerations)	1			
d) Steady Heading (track) Sideslips (roll boost OFF, then roll boost ON)	1			
e) High q flight (250 – 300 KEAS)	1			
f) Maneuvering flight pull-up (3.5g ± 0.2g)	1			
g) Maneuvering flight pushover (-0.5g ± 0.2g)	1			
h) Wind up turn @ 200 KEAS	1			
i) Bank capture tasks (45° - 45°) (roll boost OFF, then ON)	1			
j) Simulated flare with speedbrake	1			
k) Energy management to high key	1			
l) Approach and landing	1			

SS2 SPACECRAFT TRAINING EVENT ACCOMPLISHMENT

Date: 3 September 2013	Instructor Stucky	Training duration (HH:MM) 03:10
Attendees: Alsbury, Mike; Glaser, Scott; Mackay, David; Masucci, Mike; Nichols, Clint; Stucky, Mark; Sturckow, CJ		
Training Accomplished: Review of SS2 Cautions and Warnings, telelights, and emergency procedures		
INSTRUCTOR'S SIGNATURE --signed electronically—Mark P. Stucky		DATE 3 Sep 2013

Date	Instructor	Training duration (HH:MM)
Attendees:		
Training Accomplished:		
INSTRUCTOR'S SIGNATURE		DATE

SS2 SPACECRAFT TRAINING EVENT ACCOMPLISHMENT

Date: 14 August 2013	Instructor Stucky	Training duration (HH:MM) 03:30
Attendees: Alsbury, Mike Mackay, David Masucci, Mike Nichols, Clint Stucky, Mark Sturckow, CJ		
Training Accomplished: Review of SS2 POH		
INSTRUCTOR'S SIGNATURE --signed electronically—Mark P. Stucky		DATE 3 Sep 2013

Date:	Instructor	Training duration (HH:MM)
Attendees:		
Training Accomplished:		
INSTRUCTOR'S SIGNATURE		DATE

SS2 SPACECRAFT TRAINING EVENT ACCOMPLISHMENT

Date: 14 August 2013	Instructor Stucky	Training duration (HH:MM) 03:30
Attendees: Alsbury, Mike Mackay, David Masucci, Mike Nichols, Clint Stucky, Mark Sturckow, CJ		
Training Accomplished: Review of SS2 POH		
INSTRUCTOR'S SIGNATURE --signed electronically—Mark P. Stucky		DATE 3 Sep 2013

Date: 3 September 2013	Instructor Stucky	Training duration (HH:MM) 03:10
Attendees: Alsbury, Mike; Glaser, Scott; Mackay, David; Masucci, Mike; Nichols, Clint; Stucky, Mark; Sturckow, CJ		
Training Accomplished: Review of SS2 Cautions and Warnings, telights, and emergency procedures		
INSTRUCTOR'S SIGNATURE --signed electronically—Mark P. Stucky		DATE 3 Sep 2013

Mr. Lawrence asked for:**From:** Lawrence David [mailto:david.lawrence@ntsb.gov]**Sent:** Wednesday, February 11, 2015 8:23 AM**To:** Matthew Stinemetze**Cc:** Ward Lorenda**Subject:** questions

Matt,

A few clarification questions:

- Can you give me a list of the integrated simulation dates (crew and control room) leading up to PF04? Just want to match the sim logs and data cards we have for those.
- Was there sim data captured for the sim sessions Pete and Mike ran on 10/28-10/30, and if so can we get that Excel data?
- Regarding Pete's and Mike's flight times provided by Forger and listed on the NTSB 6120, how were those derived (from actual logbooks, internal records, Logbook Pro computer system, etc), and are there printout copies we can have to validate their flight times?

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Thanks,

David

Response:**First Bullet**

Per verbal the first question (SIM logs) was answered by referring to this NTSB submission: "SIM Logs Clarifications.zip"

Second Bullet

Per verbal the SIM executable always records a log of runs that occurred (as referenced in the document "Simulator training (highlighted).pdf from email on February 5th). So, we know SIM sessions occurred on the 28th - 30th (and who). Unfortunately, the SIM captures time dependent (raw) data through mission control. If it's not an integrated SIM session, mission control is not typically up and recording. Since the 28th through 30th weren't integrated SIM sessions and mission control was not active, we don't have raw data for those runs.

Third Bullet

Two 6120 forms have been submitted by Scaled. The original submittal was on November 10, 2014 and included the best information we had at the time. A revised 6120 form was submitted on February 4, 2015 with additional information that had been collected since the original submission. The pilot flight times were revised and reported to a common flight logging standard defined in the ADDITIONAL INFORMATION section of the revised 6120 form. The 6120 revisions and flight logging standard were

discussed with Lorenda Ward, Ben Diachun and Pete Siebold on January 29, 2015 in person in Mojave prior to submittal of the revised 6120 form.

The pilot flight times were compiled based on three sources: personal electronic logbooks, personal hard copy logbooks and Scaled company records. The log books (whether electronic or hard copy) are the personal property of the pilot and the co-pilot and have been returned to their owners. The co-pilot's has been returned to his widow at her request.

The SS2 times compiled based on a flight time standard¹ are shown in Figures 1 & 2. If you compare this to the 6120 form you will notice a slight discrepancy in the hours (about 0.1 hour for Siebold's time and about 1.1 hours for Alsbury's time). There are three reasons for the differences. The first is that the PDF version of the 6120 form rounds the input data (to the nearest whole number). The second is an error in the spreadsheet used to total company recorded flight hours. The third was a discrepancy in the copilot's logbook. It is important to note that these factors under reported the flight hours on the February 4, 2015 revised 6120 form when compared to company aircraft records.

In Figure 1 you will note blanks under CC12/13. The block times were not available so we referred to aircraft logbooks for those flight hours.

Siebold

Date	Flight Number	SS2 Pilot	SS2 CoPilot	WK2 BO	SS2 Land	SS2 Block Time
10/31/2014	173/ PF04	Siebold, Pete	Alsbury, Mike			
10/7/2014	170/ GF30	Sturckow, CJ	Siebold, Pete	14:57	16:12	1.3
8/28/2014	164/ CF02	Siebold, Pete	Alsbury, Mike	13:55	15:06	1.2
7/29/2014	156/ GF29	Masucci, Mike	Siebold, Pete	16:28	18:02	1.6
1/17/2014	149/ GF28	Siebold, Pete	Sturckow, CJ	15:40	17:10	1.5
8/7/2012	92/ GF21	Siebold, Pete	Colmer, Keith	13:20	15:04	1.7
7/18/2012	90/ GF19	Siebold, Pete	Nichols, Clint	15:21	17:31	2.2
6/26/2012	87/ GF17	Siebold, Pete	Alsbury, Mike	13:20	14:46	1.4
6/7/2012	83/ CC16	Siebold, Pete	Alsbury, Mike	16:27	19:16	2.8
10/19/2011	76/ CC15	Siebold, Pete	Binnie, Brian	15:30	19:05	3.6
10/16/2011	74/ CC13	Siebold, Pete	Binnie, Brian			2.9
6/27/2011	68/ GF15	Siebold, Pete	Binnie, Brian	12:31	13:48	1.3
6/21/2011	66/ GF13	Siebold, Pete	Nichols, Clint	12:28	13:25	0.9
6/14/2011	64/ GF11	Siebold, Pete	Shane, Doug	12:15	13:42	1.5
6/8/2011	63/ CC12	Siebold, Pete	Shane, Doug			1.4
5/19/2011	60/ GF09	Siebold, Pete	Binnie, Brian	13:35	14:49	1.2
5/4/2011	58/ GF07	Siebold, Pete	Nichols, Clint	13:22	14:38	1.3
4/22/2011	56/ GF05	Siebold, Pete	Shane, Doug	13:25	14:45	1.3
2/15/2011	49/ CC08	Siebold, Pete	Alsbury, Mike	14:28	16:56	2.5

¹ Reference the ADDITIONAL INFORMATION section of the February 4, 2015 revised 6120 form for the standard used.

2/14/2011	48/ CC07	Siebold, Pete	Alsbury, Mike	14:54	16:48	1.9
11/17/2010	45/ GF03	Siebold, Pete	Nichols, Clint	14:45	17:07	2.4
10/10/2010	41/ GF01	Siebold, Pete	Alsbury, Mike	13:46	15:06	1.3
9/30/2010	39/ CC04	Siebold, Pete	Alsbury, Mike	16:45	21:17	4.5
7/15/2010	33/CC03	Siebold, Pete	Alsbury, Mike	14:15	20:40	6.4

48.1

Figure 1: SS2 Pilot Flight Time

Alsbury

Date	Flight Number	SS2 Pilot	SS2 CoPilot	WK2 BO	SS2 Land	SS2 Block Time
10/31/2014	173/ PF04	Siebold, Pete	Alsbury, Mike			
8/28/2014	164/ CF02	Siebold, Pete	Alsbury, Mike	13:55	15:06	1.2
4/29/2013	115/ PF01	Stucky, Mark	Alsbury, Mike	14:00	15:03	1.1
4/12/2013	114/ CF01	Stucky, Mark	Alsbury, Mike	16:23	17:26	1.1
12/19/2012	109/ GF23	Stucky, Mark	Alsbury, Mike	14:48	15:58	1.2
12/13/2012	108/ CC18	Stucky, Mark	Alsbury, Mike	15:37	18:17	2.7
6/26/2012	87/ GF17	Siebold, Pete	Alsbury, Mike	13:20	14:46	1.4
6/7/2012	83/ CC16	Siebold, Pete	Alsbury, Mike	16:27	19:16	2.8
4/27/2011	57/ GF06	Stucky, Mark	Alsbury, Mike	13:18	14:38	1.3
2/15/2011	49/ CC08	Siebold, Pete	Alsbury, Mike	14:28	16:56	2.5
2/14/2011	48/ CC07	Siebold, Pete	Alsbury, Mike	14:54	16:48	1.9
10/28/2010	44/ GF02	Stucky, Mark	Alsbury, Mike	13:45	15:27	1.7
10/10/2010	41/ GF01	Siebold, Pete	Alsbury, Mike	13:46	15:06	1.3
9/30/2010	39/ CC04	Siebold, Pete	Alsbury, Mike	16:45	21:17	4.5
7/15/2010	33/CC03	Siebold, Pete	Alsbury, Mike	14:15	20:40	6.4

31.1**Figure 2. SS2 CoPilot Flight Time.**

Extra and WK2 flights were determined from the same sources and are how we arrived at the requested *quantity* of flights referenced in the February 4th submission to NTSB (“2015_2_3 David Lawrence”). Flight hours for those flights can be determined on request.