

**House Science and Technology Space and Aeronautics
Subcommittee Hearing On Human-Rating NASA and
Commercial Launch Vehicles And Spacecraft
December 2, 2009
Washington, D.C.**

The following are twitter notes taken by Jeff Foust (jeff_foust) and Rob Coppinger (flighthyperbola) during the House Science and Technology Space and Aeronautics Subcommittee Hearing On Human-Rating NASA and Commercial Launch Vehicles And Spacecraft hearing. The notes appear in reverse chronological order, so to read them as they were written, you should start with entry #82 and read to entry #1.

1. Hearing is now adjourned!!
2. Chair of the subcommittee praises NASA's Constellation program for safety
3. Gifford closing out hearing, thanks witnesses for "briliant" testimony. Says she sees no grounds for changing course based on safety.
4. Hanley intervned on Rep Rohrabacher on why Ares I upperstage is a bad idea and Delta should not be ignored. Hanley says Boeing has know how
5. Fragola says that Atlas 431 would likely not pass a safety review for crew missions since it uses solid strapon boosters.
6. Fragola says Atlas V study under Orbital Space Plane program found that wrapping solids around a liquid engine core was a bad safety idea
7. Video of Congress' space transport hearing now available <http://tinyurl.com/ybnvdkp>
8. Stafford says piloting spacecraft requires hundreds of hours, Alexander says commercial would have rigorous training
9. Fragola gives interesting insight into Bigelow Aerospace Boeing proposal. He says Bigelow-Boeing capsule had to rendezvous on first orbit.
10. NASAWatch reports GAP report says FAA has staffing challenges for commercial spaceflight growth <http://tinyurl.com/ylq2x9y>
11. Rohrabacher questioning safety of Orion vs some mysterious Boeing design he claims the company is working on. Might be a misunderstanding.
12. Rep Rohrabacher criticises Ares, says second stage is unproven. Fragola says J-2 based J-2X was for safety and Delta needs newstage for crew
13. Fragola says single core is more reliable than triple core, i.e. Atlas and Delta. He emphasises Ares first stage recovery forsafety analysis
14. Alexander notes that COTS providers yet to fly yet, but would compare favorably with cost and schedule growth of gov't programs.
15. Alexander says commercial alternatives would have delivered cargo long before they deliver crew and expresses confidence in commercial

16. Tom Stafford says there is a wide variety of views in Augustine committee about ability of COTS and others to deliver
17. Rep Griffiths, can we rely on COTS to deliver more timely than Constellation?
18. Note that sitting in the front row is Mike Gold of Bigelow Aerospace, a likely customer for such services.
19. Rep Griffiths commenting on lack of cargo transport to date care of COTS
20. Marshall said met with Orbital recently and asked if they were studying other markets for Cygnus, told they didn't think there were any.
21. Most witnesses (other than Alexander) skeptical about comm'l providers meeting timetable in Augustine report or finding other comm'l markets
22. Bryan O'Connor says having to re-engineer a vehicle for greater safety could be a show stopper
23. Hanley says crew safety is challenge for all developers and declines to comment on timetable for commercial
24. ASAP's Marshall says Orbital told them no mkt analysis beyond NASA transportation contracts
25. Alexander says Augustine's 7-yr for commercial providers is realistic and there is already a mkt for orbital tourism, US cld corner the mkt
26. Fragola says only 1-2 test flights needed for Area 1 to demonstrate adequate reliability.
27. Hearing chair is asking witnesses if commercial timetable is realistic and where are the non-govt markets?
28. Fragola: Sentinel article based on numbers for a LOX/methane engine on Orion that isn't being used. Actual driver now is Ares 1 2nd stage.
29. Fragola supports Hanley statement and says Orlando Sentinel article misunderstands Ares design options
30. Hanley says test and verification plan created for 2010 Ares I PDR will inform first crewed Orion-Ares flight
31. Rep Kosmas tackles Ares I safety issues
32. Rep Kosmas bringing up today's Orlando Sentinel article about Ares 1 reliability.
33. Bryan O'Connor defends Constellation original plan for ISS and lunar roles for Ares and Orion
34. Rep Rohrabacher: concerned about mindset of Constellation designed for all missions, which has failed in the past. 40 minutes ago from Twitterrific
35. ASAP's John Marshall says licensor aka FAA and customer aka NASA must decide safety for commercial
36. Webcast repeat could be available for space transport hearing soon
<http://transportation.house.gov/hearings/hearingDetail.aspx?NewsID=10574>

37. Hall, in rambling statement, asks "what kind of pressure we can put on the president" to support space program.
38. House Rep Ralph Hall says if Congress can find cash for AIG it can find it for NASA and needs presidential support. NASA needs a bail out
39. Stafford, meanwhile, says it took 39 months for Titan 2 for Gemini, doubts it could be done faster today.
40. Some debate on long to human rate launchers. Hanley says 6 yrs for Delta 4 for Orion; Alexander says about 3 yrs for Atlas 4 for comm'l.
41. Stafford says Titan took 39-months to human rate and it had dead zones and he does not expect a commercial system to be any faster
42. Alexander: not taking a stand on Ares 1. Leave LEO to comm'l sector and let NASA focus on beyond.
43. Alexander has interjected saying Hanley's comment referred to study of DeltaIV launching Orion. Alexander thinks 3-yrs, capsule is long pole
44. In answer to Griffith's question about timetable to human rate EELV NASA's Hanley says 6-yrs
45. Alexander says Constellation requirements are way beyond LEO transport needs
46. House Rep Griffiths asks Bretton Alexander why can't Constellation be funded and lessons learned provided to commercial providers
47. Rep Griffith: comm'l options "fascinating" but not supported by "hard science". Believes Ares 1 the way to go for now.
48. Bryan O'Connor says spent 3-yrs working with Russians to decide that Soyuz is safe. Lesson learnt is risk informed confidence is needed
49. Ken Davidian reports commercial space transportation hearing has ended
<http://twitter.com/flighthyperbola/status/6266404190>
50. Marshall says NASA is behind in getting human rating reqs to comm'l providers. O'Connor notes there is right no comm'l crew program at NASA.
51. ASAP's Marshall says NASA should have articulated to commercial about what human rating is earlier
52. Stafford: we were striving for four 9's of reliability 40 years ago.
53. witness testimony has finished
54. Stafford says "belief that if NASA...“step aside”...alternatives would emerge to offer safe...crew delivery...at an earlier date," is wrong
55. Stafford wishes US companies success with comm'l crew to ISS, but notes extended delays with development of ATV and HTV.
56. Stafford says he agrees with majority of Augustine cmte findings, but not all.
57. ex-astronaut Tom Stafford speaking

58. Fragola: Ares 1 2-3 times safer than alternatives (EELV, Shuttle C).
59. Fragola says Ares is 2-3 times safer than alternatives
60. Valador's Fragola: Ares 1 the singular vehicle designed from beginning with safety (not just reliability) in mind.
61. Valador Inc vp Joseph Fragola supports Ares I safety design approach
62. Marshall said Augustine assumed that for commercial services safety was...' "a given"...The ASAP believes this assumption is premature '
63. CSF's Alexander: comm'l crew is complimentary to, not competitive with, gov't programs.
64. Witness testimony can be found on righthand side of this http://science.house.gov/publications/hearings_markup_details.aspx?NewsID=2693
65. ASAP's Marshall criticizes Augustine committee for oversimplifying safety issues associated with comm'l providers.
66. NASA's Constellation manager Jeff Hanley Congressional hearing testimony can be found here <http://tinyurl.com/ykmeq54>
67. John Marshall of NASA Aerospace Safety Advisory Panel says 'how safe is safe' criteria and compliance demo must be specified
68. NASA is having an Ares I-X data media telecon on Thursday 3 Dec at 1pm CST/2pm EDT/7pm GMT
69. Hanley says Ares 1-X data providing "tremendous insights" into the various forces Ares 1 will experience.
70. Hanley is talking about process for identifying safety issues through design and use of hardware and software testing, mentioned Ares I-X
71. Hanley says 2004 astronaut office memo on safety informed Ares I choice
72. NASA's Hanley now talking about how safety will be improved with Constellation.
73. Safety in Constellation design process from very beginning
74. Jeff Hanley is speaking
75. Witness opening statements starting now with O'Connor taking about NASA safety and mission assurance.
76. Given notice hearing will have to recess in about 45 minutes because of scheduled votes on the House floor.
77. Olson: fears another accident would end NASA "as we know it". Supports comm'l ventures but says more resources needed.
78. Ralph Hall spent most of his opening statement heaping praise on and sharing anecdotes about Stafford.
79. There is a lot of material prepared for the House sci&tech's subcommittee on space and aero safety hearing here <http://tinyurl.com/ykhj2u3>

80. Safety hearing underway. Giffords: don't let advocacy or unexamined optimism get in way of making decisions on this issue.
81. Hyperbola's following US House of Reps' sci&tech cmtte's space and aeronautics subcomtte Ensuring the Safety of Human SpaceFlight hearing
82. Flipped a coin and decided to go to the House Sci Cmte human spaceflight safety hearing. Sitting a couple rows behind Gen. Stafford.