

# Marshall Institute's "A Day Without Space" July 28, 2009 Washington, D.C.

The following are twitter notes taken during the Marshall Institute's "A Day Without Space". The notes appear in reverse chronological order, so to read them as they were written, you should start with entry #80 and read to entry #1.

1. # Conclusion of program.
2. Increased capability but it failed to reach orbit. Enforcement regime is difficult discussion. Emissions measuring gets complicated.
3. Q: where are we within 5 yrs to measuring carbon emissions by nation with any accuracy? A: need in situ sensors. OCO was supposed to provide
4. Q: can DoC take over aging remote sensing sats without new authority? A: no new authority needed. \$\$\$ needed.
5. SBSP within govt still at idea phase. Economics of SBSP depends on lower cost to orbit (\$200/pound).
6. Q: is the govt looking at space as infrastructure, incl space based solar power? A: some stimulus funding being used for James Webb telescope
7. Smart grids are being developed and seeing what state laws allow for buying other power.
8. Q: what is relationship of state and local govts w/ grid study? A: now involved w/data acquisition, but involved in data analysis.
9. Most common problems in power grid is at distribution phase. Failures in transmission grid are due to solar storms. Hard to replace.
10. Q: what's the space weather status with white house policy review? A: NPOESS space wx sensors were sacrificed and there's a study being done
11. Showing map of \$1B weather events across the US. Cost of Katrina is \$133.8B. Avg cost is around \$2-5B. (My guesstimate.)
12. Committee of agency principals recently studied what would happen with prolonged disruption of power grid. This happened in Auckland NZ.
13. Without space, economic consequences impacted by loss of NOAA data, terrestrial services. Recovery delayed after disaster event.
14. There is no grant program to get small companies to buy these continuity of operations capabilities.
15. Robust and resilient communications need to be flexible and a mix of terrestrial- and space-based.
16. DoC would work to provide small companies with continuity of communications capability. Focus on sat communications.

17. Live Wire exercise found that small companies and consumers were not protected in adverse events. Focus on "non-critical" parts of economy.
18. Economic security is earth and space based. Live Wire was exercise to simulate activities disrupting comm, infrastructure.
19. Economic security consequences not included in original homeland security documents.
20. Next speaker: Dan Hurley. Homeland security was thought to be a part of natl defense and law enforcement. No mention of economic topics.
21. Showing other examples of GOES imagery. Space weather is also collected to protect power grid, sats, etc.
22. Showing image of hurricane Katrina. Gulp.
23. GOES-14 now operational. Supports 3-day forecast. Polar sats support medium and long-range forecast and climate analysis.
24. NOAA sat capabilities: continuous operations and archived data, environmental monitoring for disaster mgt, oceans, etc.
25. NASA sats launched in Clinton yrs created researcher dependence b/c data was so good. Those sats now nearing end of life.
26. Showing examples of comml space. NOAA satellite info services flies operational continuous missions. NASA flies 1-off research sats.
27. Comml remote sensing, PNT, space xport (led by DoT), Entrepreneurial space, space industrial base, export control regime, sat telecomm.
28. History of OSC: industry advocate within the Exec branch, est. 1988 and transferred to NOAA in 2004. Works on natl space policies,...
29. Panel 2: how business uses space? Charles Baker, DoCommece Office of Space Commercialization Acting Director.
30. Break befor panel #2.
31. E.g., Mobile Sat Services has no practical sustitute.
32. A: insurance issues are key, and are diven by overall funds available, not actual risks. Impact of given event depends on substitites.
33. Q: business model based on begnin stable environment. What is econ impact of hostilities on business models?
34. Growth will be in other jobs like IT but it's hard to collect this data easily.
35. Q: is space industry really a growth industry? A: we are tracking jobs now to see what is really going on. Growth on comml side.
36. Global interests lead to heightened interdependencies between national interests.
37. Substitutes to sats are fiber optics and cables which lead to security issues. Talking about the dependencies is uncomfortable.

38. Q: \$260B worldwide is small potatoes. How to quantify value added for new consumers? A: Pace's colleague, Henry Hertzfeld, is doing it now.
39. Q: private spaceports being built, will that increase small sat launches? A: yes. Virgin Galactic is looking at this market.
40. Entrepreneurship may reshape space as we know it. Outlook is bright for business and science in coming years.
41. DC has highest average wage for space industry. Avg wages continue to rise. Space is a growth industry.
42. At least 262K space jobs in US. Wages is about 2x nat'l private sector average. Economic situation may help move employees to space ind.
43. Russia is mkt leader for comm'l launch. SF tracks 29 public companies in their index. 2008 index down 45%. 2 new indices. Infrastr, services.
44. Higher growth rates for Italy, Japan, Russia on the order of 30-40%. Comm'l revenues grew by 360M\$ mostly in DTH.
45. Commercial part of overall revenue is growing faster than govt part.
46. Next spkr: Micah Walter-Range, research analyst for the Space Foundation. Annual Space Report being presented. \$257.22B revenues in 2008.
47. World ground equip growing to \$46B up 34% in last year.
48. Sat mfg revenues in US is uneven and low. Global much higher. Launch revenues low in US, ceded to Europeans.
49. Fixed services includes military lease of transponders. Driven by HD UAV video, consumption is up
50. Breakout of sat svcs, biggest portion is broadcasting. Credit card transactions and inventory controls are all sat transactions.
51. Day w/o space is a day w/o TV, (boohoo). World sat revenues in 2008 is \$144.4B up 19%. Biggest sector is sat services. Ground systems 2nd.
52. State of satellite industry report. Sat services: fixed, mobile, remote sensing, broadcasting. Sat mfg. Launch ind. Ground equipment.
53. Panel focus on marketplace. Andrea Maletter, Futron. Book recommendations: 1st book of space travel & future of the space industry
54. Real jobs must also be present to keep students enrolled in STEM. We need to create more opportunities for hands-on experience.
55. Q: we are really seeing catalyst of inspiring STEM education in Russia and India. A: Some kids get hooked by large existential goal.
56. It is not Nasa's job to promote space tourism, but public purchasing power is important.
57. A: yes. Frequency is a parameter, too. Price elasticity depends on high flight rate. Won't get there solely w/ govt or private sector.

58. Q: how do we follow up on slide regarding future of humans in space? Does it depend on cost of access to space?
59. Space was impacted by all presidents since Kennedy to serve different purposes. Space gets woven into political agendas.
60. "First there's silence, then there's policy."
61. Q: space policy doesn't seem to be high on the agenda. A: getting new space policy is listed as #3 on priority list. Already starting.
62. A day w/o space would be really, really bad, but a future without us in space would be equally bad.
63. We want future of humans in space to be imbued with our culture's values and mores. That's why we need to be there.
64. Can we live off the land? Is there something commercially useful to do there? 2x2 matrix with examples given. For space, faith-based answers.
65. What's the question that is answered by human spaceflight? One possibility: is there a human future in space? Either answer is profound.
66. Global space exploration strategy... What is the future of humans in space? Can humans in space "live off the land"?
67. It is in our interest to make regimes sustainable in a stable and predictable way. Space needs and priorities reflect free movement.
68. Challenges of space policy are related to "global commons". Air, sea, cyber-space, space. US following mode to ensure free transit.
69. Working on space program is a way to raise their quality game of new generation. Older (two bombs, one rocket) generation is retiring.
70. Goals and objectives of other countries (viz. China) are set higher than only applying technologies for use on Earth.
71. Other nations are also using these newer technologies to bypass older technologies. Keynes quote about globalization given.
72. GPS saves lives thru 9/11 and StarSat beacons. Search area is large but tech systems greatly reduce that area.
73. Also IT systems are improved thru space, e.g. GPS-enabled phones. Demand for older technologies is dropping off.
74. 1 weapon, 1 target. Increasing use of precision weapons. Also influencing operation of Caterpillar tractors. Used for increased ROI.
75. Precision warfare requires space starting at end of Vietnam War. Today's war progressed to air-space-info-centric, fully integrated.
76. Comm'l and security areas depend on space. Only open debate is human involvement in space. Why is space req'd? New way of warfare uses space.

77. Keynote speaker is Dr. Scott Pace. Space is no longer a discretionary item. Many reviews going on. Natl security policy review incl space.
78. How has space been integrated to our economic infrastructure? Trying to bring in broader non-space communities.
79. A day Without Space presented by techAmerica, David Logsdon Moderating. Discussion from yesterday's is pertinent today. Jeff peter co-host
80. Will soon be tweeting notes from the Marshall Institute's "A Day Without Space" panel.