

Commercial Angle

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Returning to Earth's Moon: Is There Room for Commerce?

By Donald F Robertson

NASA's skeletal plan to return human engineers and scientists to Earth's moon and go on to Mars finally has some flesh on it. On 19th September 2005, Administrator Dr. Michael Griffin finally announced the details - distressingly close in time and proximity to the Katrina disaster which involved NASA facilities near New Orleans.

Those who call it "Apollo redux" are not far wrong, and that may spell near-term trouble for commercial space.

The plan is extraordinary for its extreme conservatism. Most elements are derived not only from existing technology, but from existing hardware, yet still try to lay the technical and logistical foundations for future human missions to Mars. For example, the lander appears to be a scaled-up version of the Apollo Lunar Excursion Module with updated electronics, but has methane-burning engines so fuel can be derived from the Martian atmosphere and burned with lunar oxygen.

For the most part, this plan is just what the doctor ordered. Since most of the hardware has been developed for other projects, and flown operationally in space, reliability and technical confidence should be very high. The plan makes maximum use of past investments and half a century of spaceflight experience. It minimizes futuristic, overly-complex technology whose chief contributions are likely to be high costs and high failure rates.

If the plan flies, the base of practical experience in human exploration with current technology will continue to expand. Each flight builds on the last - in essence, starting where Apollo 17 left off in 1972 - slowly building to real experience of surviving on Earth's moon.

The value of experience should not be underestimated. Compare the simple landings of Apollos 11 and 12 with the complex exploration and scientific operations successfully executed on Apollos 15, 16 and 17. A case could be made that more was learned about working on Earth's moon in four years of flight operations than have been learned in the intervening three decades of paper studies and theoretical research. As any school teacher knows, learning by doing works best, and in this respect learning to survive and work on the lunar surface is no different than practicing any new skill.

If Dr. Griffin's plan has a problem, it is the proposal to spend some \$10 billion on new Shuttle-derived launch vehicles so soon after hurricanes damaged several Ameri-



can states. This investment must be made before a single astronaut goes to Earth's moon and produces any results.

Dr. Griffin would have been smarter to do whatever it took to fit his plan into the existing, semi-commercialized Evolved Expendable Launch Vehicles.

Ostensibly, he avoided that for technical reasons. Using larger launch vehicles reduces the complexity and risk of docking large numbers of components together in orbit - and helps prepare for Mars. A more practical reason for using Shuttle-derived components is keeping the Shuttle labor force employed. That keeps Members of Congress and Senators happy in the primarily southern and politically conservative states where Shuttle components are assembled and maintained.

The plan's technical conservatism - its chief strength - probably spells trouble for commercial space in the near term, and that spells trouble for the plan's long-term sustainability. Sticking five Space Shuttle Main Engines on the backside of an External Tank, and building scaled-up Apollo hardware, does not allow much room for entre-

preneurs to make money with bold new ideas.

Smaller EELV-derived launch vehicles, while increasing the technical complexity of the plan as a whole, would provide an easier entrée for commercial rockets. It may prove difficult to keep commercial space advocates and investors interested in another government production in which they play only a marginal part.

Dr. Griffin, having worked for small space companies on the other side of the fence, must have been aware of this problem but had little choice. Until there is a government-funded infrastructure on Earth's moon, there can be no lunar market for commercial space firms to serve. Dr. Griffin's job is to get that market in place - or, more realistically, establish as much momentum as he can in the three years before a new president installs a new team at NASA.

Fortunately, Dr. Griffin has another market for his commercial space friends: supporting the International Space Station. Putting Station logistics into commercial hands is a goal that likely can be achieved in three years and to which Dr. Griffin has given at least vocal support. Dr. Griffin also appears to be working very hard to retire the Space Shuttle as soon as international and congressional politics allow, freeing up money and engineers.

Taking these steps would allow NASA's attention and resources to be dedicated to Earth's moon, while giving the commercial space community a near-term market at the Station. That market could then pay for developing new ideas and equipment for lowering the costs of supporting the nascent Lunar Base - while NASA turns its eyes to Mars.

Given the political and financial realities - and ongoing natural disasters and war - this is the best Dr. Griffin can hope for. <<<



NASA's new crew exploration vehicle in lunar orbit. Artist's concept by John Frassanito and Associates.