

# It's Not Possible to Implement President Bush's Moon/Mars Program

by Marsha Freeman

When President Bush announced on Jan. 14 his new initiative to return Americans to the Moon and then go on to Mars, it was hailed by many as the first time since President John F. Kennedy's 1960s Apollo program that the nation had a definite space exploration goal. But taking a close look at the way the President was approaching accomplishing the goal, revealed that without serious changes, it would be doomed to fail.

While few argued with the "vision," many scientists have been concerned that this new emphasis on human exploration, without substantial funding increases, would put pressure on NASA to save money by cutting back space science programs. Aerospace workers and Congressional representatives expressed the fear that the proposal to end the Space Shuttle program, before there is a vehicle to replace it, and disengage prematurely from the International Space Station, could make it appear that the space agency now had "too many" talented and experienced scientists and engineers, leading to job losses.

On June 16, the Commission appointed by the President to advise the White House on how to implement the Moon/Mars policy, released its 60-page report. Some of the space scientists' worst fears are now borne out in the Commission's recommendations to the President.

## 'Transformation' and Privatization

The Commission begins with the lofty goals of implementing the President's program so as to "inspire the nation's youth, yield scientific breakthroughs, create high technology jobs, improve our industrial competitiveness, demonstrate America's leadership, and improve prosperity and the quality of life for all Americans." To do this, the report states, will require that NASA be "decisively transformed," requiring "significant cultural and organizational changes." This must not be the NASA of the Apollo era, they warn.

The use of the term "transformation" is not accidental. Pete Aldridge, Commission chair, until recently was active in carrying out the Pentagon's "military transformation" policy, as Under Secretary for Acquisition, Technology, and Logistics: an outsourced, information-age military.

"Root-and-branch change must be fully internalized throughout NASA," the Commission insists. In order to implement the new policy within the established budget guide-

lines, the Commission says the most important change NASA must make is in its relations with the private sector. NASA should rely on industry for orbital launch capabilities, and all other hardware and data that industry can provide. The assumption here is that it will be cheaper to do so. "NASA's role must be limited to only those areas where there is irrefutable demonstration that only government can perform the proposed activity."

In fact, NASA's research and development capabilities have pushed forward the state-of-the-art in hundreds of technology applications, both in the space program and in the overall economy. The Commission has it backwards: Only where industry technology is superior to that of NASA, should it be purchased by the space agency. Otherwise, NASA's job is to develop the revolutionary new technologies that are too long-term, or high-risk, or expensive for industry to develop. In addition to its in-house facilities—some modeled on the highly successful arsenal system employed by the military in previous eras—NASA already has privatized much operational work through contracts to private sector and non-profit organizations, as well as many R&D activities.

Parenthetically, the Commission suggests that the Administration evaluate the possibility of involving industry, by allowing advertisements or sponsorships to "provide supplemental revenues to accelerate discovery." Remember Enron Field?

NASA will have to face the fact, the Commission states, that its Apollo-era infrastructure is not suited to the new exploration vision. NASA's ten field centers must be "renewed, empowered, focused, and more effectively leveraged."

What the Commission really meant, as chairman Aldridge stated at the press conference on June 16, is that there should be an activity modeled on the Base Realignment and Closure Commission, to lead to the closure of one or more "redundant" NASA Centers. But, Aldridge admitted, the Commission's report "would have been burned" the day it was presented, if it had included the proposal to shutter any NASA field centers.

Instead, the Commission proposes that the field centers be turned into Federally Funded Research and Development Centers (FFRDC), operated by a non-government organization, chosen through a competitive process. No longer protected by civil service regulations, employees at the centers could be fired if the project they work on has been cancelled

in order to fund the new program.

Or, rather than fire people, the FFRDC could try to drum up outside work to keep its people employed. The Department of Energy research laboratories that are FFRDCs now have scientists, who had worked at the frontiers of physics for decades, designing pollution control devices for near-by towns.

How can the Commission seriously propose that the Moon/Mars mission would not only require all of NASA's existing scientific and engineering talent, but thousands more people, in an upgraded workforce?

## The Pentagon Model

The President's Commission recommends that a slew of organizational and management structures and approaches now used in the Department of Defense be imported into the space agency. This ignores the fact that the primary responsibility of the DoD is to operate a set of functional capabilities so the nation can defend itself. NASA, on the other hand, is a research and development agency, whose mandate is to develop the next generations of advanced technologies, to enable the exploration of space. These are two quite different missions.

It is recommended in the Commission report that NASA "enhance its managerial effectiveness" by creating an organization comparable to the Cost Analysis Improvement Group at the Pentagon, which makes independent cost estimates of weapon systems. This is supposed to provide a check against program managers who underestimate the cost or schedule of tasks, and also to provide discipline in the procurement process.

But NASA is not producing multiple models of guns, ships, or airplanes, in which one version that overruns cost or schedule can just be cancelled, as is done in the Defense Department. Many pieces of space hardware are virtually one-of-a-kind, involve multi-years of research and development, and challenge the frontiers of technology. Will the manned Moon mission be cancelled by budget bureaucrats, if it runs over budget?

Just as the Commission itself argues that the "total cost" of the Moon/Mars mission cannot be provided to Congress because no one knows what it will be, the same is true of numerous NASA programs. Managers give it their best guess when motivating the funding for a program. Figures presented that purposely underestimate the projected cost of a mission, are a function of a lack of support, particularly from Congress, to provide the resources that are necessary. That problem will not be changed by having an "independent" analysis.

Similarly, the report proposes that NASA create an organization drawing upon lessons learned from the Defense Advanced Research Projects Agency (DARPA). This small organization—chartered to fund high-risk research, some of which could introduce fundamental changes in technology—functions as an "incubator of cutting-edge technologies."

However, as the Commission off-handedly admits, NASA has entities, such as the Institute for Advanced Concepts, and the future propulsion office at the Marshall space Flight Center, that already do that.

Another recommendation in the Commission report is for NASA to use the Pentagon's "lead system integrator" approach. "How does the U.S. Secret Service protect the Commander-in-Chief?" the report asks, as if that is comparable. The answer provided is, with a "system-of-systems." The integration of numbers of complex systems, it explains, should be done by a "lead system integrator," which gives management the responsibility to select contractors for design and manufacturing, etc.

Perhaps the Commission should take a harder look at the management technique developed in NASA to land a man on the Moon, about which books have been written on how to apply this method throughout industry. Each field center had responsibility for major systems, such as the Saturn V rocket or the Apollo spacecraft, each of which was complex, and ultimately built by industrial contractors. The job of NASA headquarters was to ensure that all of the systems would together carry out the mission. It worked quite well.

The Commission correctly points out that for the vision to be implemented, it must be a national program, supported by the nation's leadership, and not just a NASA mission. Sidestepping the fact that the President has not mentioned the program *even once* since announcing it five months ago, the Commission promotes constituting a space Exploration Steering Council, likely chaired by the Vice President, to include "representatives of all appropriate Federal agencies." This attempt to resurrect a National Space Council is misguided.

Except for the Kennedy Administration, when Vice President Lyndon Johnson took an active interest in space along with the President, a Cabinet-level Council has generally brought other departments' interests into policymaking discussions, rather than providing any help to NASA. If the Commission's aim is to bring all governmental resources to bear on the exploration mission, this should be done at the technical, not the policy level. NASA already has working program-level cooperation with the Departments of Energy and Defense, as well as with the National Institutes of Health.

NASA does not need a new set of structures and organizations, or a cultural make-over, in order to go to the Moon and Mars. Nor will what NASA does, largely determine whether or not the program will be carried out.

The Commission places great emphasis on the idea that the Moon/Mars vision must be "sustainable" over many sessions of Congress and ten Presidential Administrations (and one could add, numerous NASA Administrators). What the program needs is the commitment of the White House to explain the critical importance of the mission, and fight for the resources to do it. That is the way it will have the necessary backing of the Congress and the American people.