Congress Looks at the Space Station

Now that President Reagan has endorsed the National Aeronautics and Space Administration (NASA) plan for a permanently manned space station, the issue goes to Congress. No consensus of opinion has formed there yet, but key committee staffers contacted by *Science* believe that approval is likely. NASA has made a vigorous case for the utility of the station (*Science*, 24 February, p. 793), and those members who have studied the idea are reasonably comfortable with it.

However, that does not add up to a blank check. The committees are particularly concerned about protecting NASA's science and applications programs during space station construction, and they want to hear in detail how the agency can avoid the kind of delays and cost overruns that haunted the space shuttle. "Nobody wants that to happen again," says one staffer. They are also determined to take a hard look at NASA's justification for moving straight to a station housing six to eight people, rather than starting with something smaller—perhaps even unmanned.

NASA, as it happens, is acutely aware of its credibility problem, and officials there are quick with reasons why the shuttle fiasco will not be repeated.

To begin with, they point out that the shuttle got into trouble because of two critical new technologies, the thermal protection tiles and the shuttle main engines, both of which proved to be unexpectedly difficult to master. Added to that was the agency's "success-oriented" strategy: faced with chronically tight budgets, plus an inability to make accurate cost projections, NASA cut back on its testing program in the hope that all the shuttle components would work when they were finally put together. They did not. The upshot was a spacecraft that was 2 years late and several billion dollars over budget.

In the case of a space station, however, NASA sees no need for critical new technologies. The requirements for power, life support, and so forth are hardly trivial, but planners believe they can be met with relatively straightforward extensions of existing systems. "The station is not a flying machine, it's a laboratory and workspace," says NASA administrator James M. Beggs, who once ran the F-16 fighter program at General Dynamics. "Weight is not such a constraint, and you don't have to make such an excruciatingly difficult series of trade-offs." To minimize the chance of technological surprises, moreover, Beggs has also pledged a long (2-year) period of planning and design before letting the engineers bend metal.

A second major factor in the shuttle debacle was its critically tight timetable. In the wake of Apollo the shuttle was almost all NASA had, and to protect the program agency officials tried to get as many people as possible committed to it. On the assumption that the shuttle would start flying in 1979, they scheduled Department of Defense payloads, communications satellites, and the European Space Agency's Spacelab. Most dramatically, they scheduled big-ticket planetary missions like the Galileo Jupiter probe—after they had canceled the agency's heavy-lift Titan-Centaur launcher in 1977 and left the deep space missions with no alternative.

So, of course, when the shuttle was late the whole thing fell into chaos. Especially hard-hit were the science and applications people. It was not that the shuttle overruns ate into their funding directly—they have always had roughly 15 percent of NASA's total budget—but that they were now committed to a bunch of missions that could not fly until the shuttle was ready. Money that might have gone to new missions went instead to sustaining the old ones.

This time around, however, NASA insists that the timetable will be much more relaxed. The nominal launch date for the station is 1992, says Beggs, "but that's not terribly firm. I've always said 'in the early 1990's,' and the President said, 'Within a decade.' " In particular, no one will be absolutely dependent upon having the station there at a specific time. Beggs has always billed the station as "the next logical step" in space—not a replacement for the shuttle but an extension to the shuttle, doing the same things in a more efficient way. This means that the agency could slip the station a year or two if need be, and still meet its other commitments because it will still be flying the shuttle.

The problem, of course, is that NASA says all these things and the skeptics stay unconvinced. They remember that the agency was just as full of assurances 12 years ago when it was trying to sell the shuttle. At the moment, most of the skepticism seems to be focusing on the issue of manning of the station, and particularly the question of crew size. This is an important matter: life support and crew safety considerations promise to be the largest single factors in the $8 billion cost of the station.

"I just have this gut feeling that what they're going for is too big," says one House staffer. "I'm supportive of the space station as a facility. But why is NASA talking about an initial crew of six to eight, with two habitation modules? Why not start out with three or four people and one module?"

In fact, why start out with any habitation modules at all? Many observers, especially in the scientific community, have advocated a more evolutionary approach: start the station with unmanned orbital platforms to carry telescopes and other sensitive instruments—NASA plans to include at least two such platforms in the space station complex anyway—and then only add the manned modules if and when they are needed. This approach was first advocated several years ago by NASA's own Marshall Space Flight Center and was independently put forward last year by the graduate students and faculty of the Stanford University Engineering School, where it was called the "Pleiades" concept.

NASA officials say that they are open to such an approach, although they will also concede that the size and timing of the space station crew will not be totally decided by considerations of utility. Reagan, after all, said he wanted a *manned* space station, not a collection of automated platforms. On the other hand, they argue that the six-to-eight figure is not completely arbitrary, either; a recent series of studies of missions for a space station, commissioned by NASA from outside contractors, indicates the need for five crewmen at a minimum.

Hearings will be held on the space station throughout the spring. It should be an interesting debate.

—M. MITCHELL WALDROP