

Space Station Cost Estimates Double

A more complete accounting suggests a cost of some \$16 billion; even supporters wonder if it is time to think again

AN internal study by the National Aeronautics and Space Administration (NASA), said to be the first complete "bottom-up" assessment of the cost of its proposed space station, has yielded estimates as high as \$16 billion—twice the \$8 billion figure quoted when the project was approved in 1984.

Coming at a time when the agency is also trying to recover from the Challenger accident, purchase a new fleet of expendable launch vehicles, inaugurate new initiatives in technology development, and reinvigorate its science and applications programs, the revised space station figures have shocked even the project's supporters. Thus, NASA will certainly have to face some tough questioning on Capitol Hill. It may well be forced to stretch out construction of the station, now planned for 1993 and 1994. And it may have to down grade the station, or even lose the project altogether.

Ironically, the new cost analysis grew out of the agency's efforts to avoid the mistakes of the past, particularly the delays and cost overruns that resulted from over-optimistic projections during the development of the space shuttle. The study was inaugurated in September 1986 by NASA administrator James C. Fletcher, as part of a larger review of the space station program as a whole.

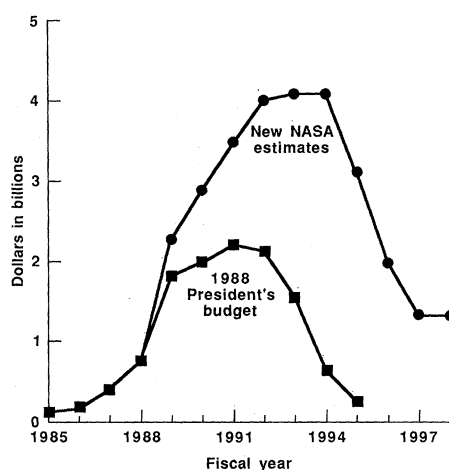
Meanwhile, the NASA comptroller's office conducted a parallel and independent review of space station costs. Both studies were completed by early 1987, and after the two sets of figures were reconciled, Fletcher forwarded the results to the White House Office of Management and Budget (OMB). As *Science* went to press, NASA and OMB officials were still discussing the new numbers; assuming that OMB accepts the analysis, NASA will then make an official presentation of its findings to Congress during its budget hearings this spring.

The cost increases stem from a number of factors, say those who have seen the report. For example, approximately \$1 billion arises from a better understanding of what the station will really involve. The \$8 billion figure quoted in 1984 was highly tentative, based on little more than an extrapolation from other NASA projects. To avoid the kind of technical surprises that plagued the shuttle program, NASA has devoted 2 years

and some \$600 million to design and definition studies of the station prior to procuring hardware. More recently, post-Challenger restrictions on the performance and flight rate of the shuttle fleet have led to revisions in the planned assembly sequence of the station. The result in both cases was a higher cost.

Another \$2.5-billion increase comes from additions to the program's reserve fund, which is intended to cover unanticipated cost growth and other uncertainties.

The largest item, however, comes not from cost increases per se, but from a more



Space station costs. The figures in the new cost schedule are roughly twice the estimates NASA presented to Congress in the fiscal year 1988 budget in January.

comprehensive method of accounting. The original \$8 billion estimate specifically referred only to hardware development costs; other space station-related expenses were scattered around under different headings in the NASA budget. Now, for the first time, those costs have been made explicit. "What we've tried to do is develop a realistic assessment of not just the hardware, but the institutional and programmatic elements," says NASA spokesman Mark Hess. These elements include primarily the ground-based infrastructure needed to support the station, such as test facilities for spare parts, or simulators for crew training. Estimated cost: \$3.6 billion.

OMB's budget examiners seem to have

reacted fairly calmly to all this, in part because they have always known that the \$8 billion would not cover the full cost of the station.

One clue to OMB thinking came on 10 February, when OMB director James C. Miller III sent a memorandum to President Reagan warning of sharp cost increases in the space station program—which Reagan has publicly endorsed—and analyzing the reasons for it. The memorandum contained no commentary pro or con, which has led NASA space station officials to see it as a positive document—"Especially," says one, "when you consider what Miller *could* have said."

On the other hand, OMB has reportedly asked NASA for a more thorough evaluation of various cost-saving options for the station, including such possibilities as stretching out the assembly schedule, or providing only a "man-tended" station—that is, occupied by astronauts only during shuttle visits—instead of a permanently manned facility.

On Capitol Hill, meanwhile, feelings are decidedly mixed. On the one hand, NASA is getting high marks for honesty. "In the long run," says one key space committee staffer, "I think they're doing themselves a favor by airing the issues completely now, instead of letting the surprises crop up further down the road."

On the other hand, the new accounting has come as a shock to those who were still thinking that \$8 billion would cover everything on the station. Even more disconcerting are station-related costs that even the new figures do not cover. NASA has been holding the report itself very closely. But according to Miller's memorandum, which has been widely circulated in Washington, these added costs include:

- The cost of operating the station once it is assembled, estimated to be at least \$1 billion per year. (All figures are in 1984 dollars).

- The \$1 billion to \$2 billion estimated cost of a "lifeboat," which may be included in the station to return astronauts safely to Earth in an emergency.

- The cost of shuttle flights to assemble the station and to ferry cargo and passengers up and down.

- The cost of science and technology experiments on the station.

As a result, even people who were previously in support of a full-speed-ahead approach to the space station are now taking a hard second look. As one staffer says, "[These new cost figures] are a good sincerity test of people's support for the space station."

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