Redesign Creates Consternation Abroad

While U.S. space station supporters fear that NASA's crash program to redesign the craft may mean the end of the station itself (see main story), the United States' international partners are worrying about their own stakes in the enterprise. Whatever redesign option is chosen, the partners will face increased costs in adapting their laboratory modules and equipment to fit. At worst, they may be frozen out altogether. "We're not happy," says an official of the European Space Agency (ESA).

On 13 May, the space agencies of Europe, Japan, and Canada took the unprecedented step of calling a meeting of the four partners in the Freedom project at the U.S. State Department to voice their concerns about the redesign, and have scheduled another meeting there for 11 June. Most of the unhappiness at the May meeting focused on the most radical of the three possibilities, Option C. Option C would require both ESA and the Japanese space agency, NASDA, to redesign the electrical, thermal control, and data management systems of their laboratory modules—if they could be accommodated at all. With the add-on modules, a complete Option C station would include 136 experiment racks—nearly three times as many as in the original station and far more than could be supported by the station's power supply. In addition, the solar arrays in Option C would block some experiments in the Japanese lab. Option C and a second redesign candidate, Option A, would also require only part of the mobile servicing arm being developed by the Canadian Space Agency.

The best of a bad lot, as far as the international partners are concerned, is Option B, because it deviates least from the current design. But whichever option is chosen, both ESA and NASDA are concerned that NASA, as part of the redesign, may adopt a more highly inclined orbit than originally planned, at an angle of 51.6 degrees to the Equator rather than 28.5 degrees. The higher angle would permit the Russians to reach the station and deliver a Soyuz capsule as a life raft in case of an accident. But it would require the shuttle to burn more fuel and hence reduce its payload. Not only would this necessitate more assembly launches, but at least until NASA developed a new, lighter fuel tank and more powerful rocket boosters for the shuttle, it would mean that the heavy European and Japanese modules could not be launched at all.

–Daniel Clery

port to a "blue-ribbon panel" of independent experts, chaired by Charles Vest, president of the Massachusetts Institute of Technology (MIT). This report will be a decision matrix, according to Goldin, laying out data on three different options, three funding levels, and at least two stopping points for each station. It will also consider putting the station in a high-angle orbit (51.6 degrees rather than the usual 28.5 degrees) so that Russian spacecraft could reach it.

Three days after the Vest committee receives the data from NASA—on 10 June—it's supposed to pick a winner and forward a recommendation to President Clinton. The international partners are planning to meet the next day in Washington to review the report themselves. The White House is scheduled to send its final decision to Capitol Hill on 15 June, to be included in the 1994 appropriation bill for NASA. The fast pace leaves almost no time for the international partners to get into the act, says one European science attaché. "To whom do we take our comments after 15 June," he asks, "to Congress?" This is just one of many issues that trouble Canada, Japan, and the European Space Agency (see sidebar on this page).

Scientists planning to use the station for research, meanwhile, are trying to figure out how much room for science will be left in the redesigned station. The signs aren't encouraging. Bonnie Dunbar, a NASA microgravity science official leading the scientific assessment of the new options, says, "We are cutting capabilities...to the users in all cases." Perhaps the biggest threat to science, says Daniel Hastings, professor of aeronautics and astronautics at MIT and chair of a space station advisory group, will be the inability of two of the three candidate designs to sustain a crew in space for more than 20 days, at least at first. That would restrict researchers' ability to do long-term (6-month) experiments or even to run shorter experiments properly.

Many scientists are concerned that they may not get answers to questions about crew, power, and communications in time to comment on the new proposals before they go to the president. "It's a moving target," says one. That's been true of the space station for the past 9 years, say NASA watchers. But the target only seems to speed up as time goes by. "For someone like me who's watched [NASA] closely for over two decades," says John Logsdon, director of the Space Policy Institute at George Washington University, "it's never been this crazy."

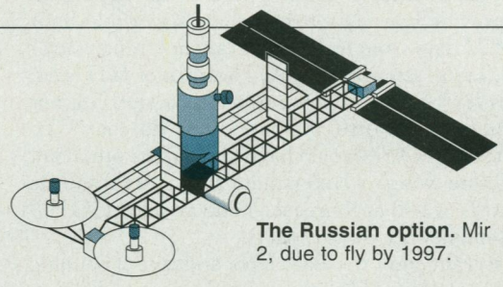
–Eliot Marshall

SPACE SCIENCE

NASA Researchers Eye Mir

Last week, several crystallographers met at the National Aeronautics and Space Administration's (NASA) George C. Marshall Space Flight Center in Huntsville, Alabama to discuss plans for an experiment to grow protein crystals aboard a space station next year. No, they weren't talking about Freedom, the U.S. Space Station that's still on the drawing boards and being redesigned (see story on p. 1228). These scientists had just received the go-ahead from NASA to begin planning an experiment aboard Mir, the Russian Space Station that has been orbiting Earth since 1986.

For years the scientific community has debated whether or not space station Freedom's price tag—currently $30 billion—is justified by the kinds of scientific studies that NASA hopes to conduct aboard it. Fueling the debate has been an argument advanced by some scientists that NASA could do the same work aboard Mir, or on Mir 2, a successor space station that the Russian firm NPO Energia is building and plans to launch in late 1996 or early 1997. Several scientists have approached NASA's life sciences advisory subcommittee, recalls Francis Haddy, a cardiovascular physiologist at the Uniformed University of the Health Sciences who chaired the subcommittee until last November, asking, "Gee, why don't we use Mir?"



The Russian option. Mir 2, due to fly by 1997.

While insisting that research on Freedom would be better, NASA nevertheless has responded to Mir's advocates: Last fall it sent a delegation to Moscow armed with a wish list of joint research projects that might be done aboard Mir, as part of a scientific exchange signed by the United States and Russia last July that will also see a cosmonaut fly on the shuttle this November. After assessing Mir's capabilities, NASA officials have decided in the past few weeks to go ahead with several joint projects, including the protein crystallization