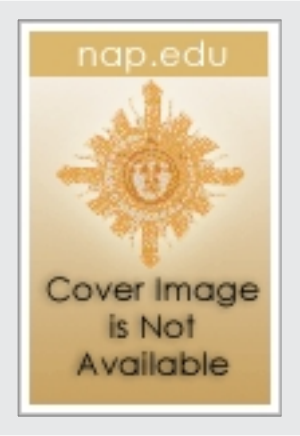

On Research Facilities Planning for the International Space Station: Letter Report

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On Research Facilities Planning for the International Space Station

On July 8, 1997, Dr. Claude R. Canizares, chair of the Space Studies Board, Dr. Mary Jane Osborn, chair of the Committee on Space Biology and Medicine, and Dr. Martin E. Glicksman, chair of the Committee on Microgravity Research, sent the following letter to NASA Administrator Daniel S. Goldin.

During its meeting in Washington, D.C., March 3-5, 1997, the Space Studies Board was briefed by NASA senior managers on program status and planning in their respective areas. Among other subjects, Board members heard about assembly and utilization of the International Space Station from Mr. Mark Uhran of the Office of Life and Microgravity Sciences and Applications (OLMSA). The space station program is working energetically to overcome a number of challenges. Over the years, the Board has attentively followed the progress of the space station program, particularly with regard to research utilization. Indeed, since its inception in the early 1980s, the space station has been the subject of numerous focused reports from the Board and has also been discussed in a number of research strategy and assessment documents.[1]

Among the challenges currently facing the space station program, those imposed by its flat development funding profile are clearly among the most demanding. It is the Board's understanding that, of the $2.1 billion yearly program budget, a substantial share of resources that had originally been intended for development of research facilities and outfitting is being allocated to development of the vehicle itself. As a result, key microgravity research facilities such as the furnace and the combustion and fluid science facilities that were to have been launched and put into operation in 2000 will now be delayed until 2002. Availability of gravitational biology habitat facilities will slip from 1999 to 2001, and the life sciences centrifuge will be delayed until at least the end of 2002. As a result, most of this research equipment will not be available to investigators until approximately five years from today.

NASA has planned only two further major shuttle laboratory science flights: the current MSL-1 reflight and Neurolab in 1998, both Spacelab missions. In addition,

the last of the U.S. Microgravity Payload flights, USMP-4, will be flown this November. Current planning calls for discontinuation of the Spacelab series after Neurolab. From then until the space station is fully equipped for science, access to space for life and microgravity research may be limited largely to shuttle middeck lockers. While some worthwhile experimentation can take place in lockers, it is generally recognized that they cannot offer the range and capabilities of a dedicated Spacelab mission or of the outfitted space station itself.**2** Thus, after the flight of the Neurolab in 1998, there will be a sharp decline for four years or more in flight research opportunities in microgravity and life sciences. The OLMSA has devoted years of careful planning and diligent management to developing an investigator community capable of making productive use of the space station's unique research potential. The Board is concerned that, without adequate flight opportunities, much of the momentum of this significant national investment may be lost and the progression of experimental activity leading to space station utilization seriously impaired. If this occurs, it could delay the research community's ability to take advantage of the space station once it is fully operational for science.**3**

The Board understands that circumstances beyond NASA's control, including, for example, the synchronization of on-orbit assembly of the station with various components to be provided by international partners, may result in a slowdown in the pace of assembly and could create some flexibility in the shuttle manifest during the assembly period. Should this be the case, and assuming maintenance of a fixed number of shuttle flights per year, there may be opportunities in the 1999-2000 time frame to dedicate some shuttle missions to life sciences and microgravity research. If feasible and compatible with agency planning and resources, this approach could be used to reduce a five-year gap to two for microgravity research and a four-year gap to two for the life sciences. The Board believes that such a strategy could have a pronounced effect in conserving the vitality of U.S. research in microgravity and space life sciences and do much to accelerate our realizing the benefits of the space station investment once the station is fully outfitted early in the next century.

The Board is pleased to have the opportunity to work with NASA to optimize the scientific productivity of the space station program and looks forward to a continued dialogue on these aspects of the shuttle and station programs.

References

1 See the six volumes of the Space Studies Board Annual Report for 1991 through 1996, National Academy Press, Washington, D.C.

2 The proposed Spacehab Science Double Module could provide a reduced, full-size rack capability.

3 The Board expressed similar concerns about precursor research in a letter on July 26, 1994, in the context of the Shuttle-Mir missions (Space Studies Board

Annual Report—1994, National Academy Press, Washington, D.C., 1995, pp. 57-58).