NASA BRIEFINGS ON SPACE TRANSPORTATION SYSTEM

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Introductory Remarks

by

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My colleagues and I are happy to have this opportunity to meet with you and to continue the discussions with the European community about the planning and programs which could lead to a joint future for us in space endeavors. Dr. Paine, who is taking an active and personal interest in international cooperation in space, has asked me to express to you his very best wishes, and his desire to make clear that the United States would like not only to continue its present good cooperation in space ventures with you, but to expand cooperation in large measure.

This desire and hope springs not only from our knowledge of the fruits of our existing relationships, but also from recognition that the ambitious enterprises we are defining for the 1970s will need the talents of the scientific, engineering, and industrial communities throughout the world. And beyond the area of research, development, and experiment, our concept of the space activities of the 70s includes the

idea of using space facilities for a variety of practical applications.

The framework of the future space program was developed by a Space Task Group which reported to President Nixon in September of last year. Their report recommended a program balanced among science, technology, and applications; between new technological development and the expansion of global systems such as the weather and communications satellite; and balanced between manned and unmanned activities in space. At the core of this program of balanced goals are two new concepts. The first is a transportation system for carrying payloads to and from space, which will be reusable and hence will reduce the cost of space programs by an order of magnitude or more. The second new element is a permanent space station with facilities for a wide variety of uses, ultimately extending to industrial-type production operations. These two new tools--if I may use that term--are intimately related, as will become obvious to you during the course of the conference. The uses of the space station depend in good part on the availability of the economical logistic system presented by the shuttle rocket planes. In a broader

context, almost all operations near earth and to the planets will be shaped by the economics of the reusable vehicles.

The reusable rocket plane or shuttle will carry tons of payload to orbit and can remain there for days before returning to earth. Its crew can repair or resupply previously placed payloads, or it can move them to another orbit or return them to earth for examination or repair and reuse. It will be the main logistic carrier for the space station. I will not go into further detail, since all aspects that I have mentioned, and more, will be discussed by my colleagues from NASA and its contractors.

The space station we see as a place where men can live and work in orbit for indefinite periods. A progress report on the work under way to define its structure and use was given last month in Paris to a group which may have included some of the people here. The station construction would probably be modular, so that over the years we can add additional parts as we define new experiments and uses. It will grow during a decade to a very substantial research facility, and ultimately, we believe, to a unique facility for practical uses, including perhaps commercial manufacture.

Even at the present early stage of definition we can perceive exciting and fruitful applications in astronomy, environmental physics, research in biology and the life sciences, in development of earth resources survey techniques, and more. I am sure you, too, can conceive of other applications for this, man's first facility free of the earth's gravity, outside the earth's atmosphere, continually passing over all parts of the earth.

The shuttle and space station clearly imply great changes in the cost and manner of working in space. We have felt that it is important to share these plans with you, since they will lead to changes in the concept and modes of space work of all nations, in addition to the United States.

What are some of the implications to you as well as to us, of the changed modes of space use? First, the reusable shuttle system, both from earth to orbit and from near-earth orbit to other locations, will greatly reduce the cost of carrying payloads of any type. Hence we conclude that many of the existing tools and techniques for space research will surely become economically unattractive and obsolete. Secondly, the shuttle system will provide a

gentler, less demanding environment for payloads. They will only need to withstand acceleration of 3 g and the volume available to them will be larger. The weight-carrying capacity of the shuttle will also allow payloads to become heavier if necessary. The reliability of launching should be increased, so loss of payloads will be reduced. The shuttle system will have the ability to retrieve payloads, return them to earth where they can be repaired and refurbished and finally re-launched. Man can be introduced into the experiment loops, to use his amazing brain-computer for modifying and correcting faults and seizing on unexpected opportunities, thus reducing the stringent requirements for fully automated payloads. These potentialities will become evident to you in the course of these presentations.

This is obviously an ambitious objective. It has been accepted in principle by President Nixon. We have embarked rapidly on the necessary study phases and technology investigations which will form a solid foundation for the later development phases. The exact pace of the U.S. program will, of course, be determined by the U.S. Congress. We have submitted the budgets to enter on the path we have delineated, and I believe we are making good progress in

obtaining the necessary support and funding. I would point out that we have highlighted to the President and Congress the potentialities for increased cooperation with the international community at all levels of the program: in the conceptual phases, in the analytical and study phases, in generation of technology, and in the use of the system for both research and applications. Dr. Paine and his staff have visited and traveled extensively to further this aim. The prospects for your involvement obviously require the most careful examination in the light of your own interests and on the basis of the merits of the concept. We wish to facilitate that examination and have cooperated closely with the members of the European Space Conference and other interested nations. We are attempting to provide the fullest possible access to our Centers, Headquarters, and contractors, so that the necessary information base can be built up. The briefings here now, and last month in Paris, are steps in that direction. I know that your representatives in ESRO and ELDO have already taken concrete action to develop specific studies of use to you, and to provide the direct communications channels between NASA and your agencies. I especially welcome these early actions because we

recognize that it is desirable for your involvement to begin at the earliest stage of planning and thinking. We expect to make revisions in thinking as we develop more data and as our and your views become clearer. Thus, your thoughts, assistance, and close participation are both solicited and welcomed.

Dale Myers, who is in overall charge of NASA's manned space flight programs, will first give an overview and program plan for the space transportation system which includes the reusable shuttle and tug. Then you will be exposed to the concepts and plans of two NASA contractors who have been assigned the design/definition study responsibilities. One is from the North American Rockwell Company, the other from the McDonnell-Douglas Company. There will be then a discussion of the impact of these concepts and designs on scientific and applications payloads. On the second day, the primary emphasis will be on the main rocket engines and on the preparation of basic technologies needed for the system. The reports, will be given by people from NASA Centers, will cover the categories of aerothermodynamics, structures and thermal protection, auxiliary

propulsion, avionics, and operations. Finally, Mr. Frutkin, our Assistant Administrator for International Affairs, will discuss the possibilities and the mechanisms for international participation in the program.