

foreign sources for processed materials and products; and increased urgency for plant modernization.”

As the accompanying study of the economic impact of the “in-width” military buildup proposed by the new administration shows, the industrial base of this country is insufficient to sustain a significant increase in industrial output. The industrial plant and manpower base of the country are too old and too inefficient to increase even the scale of the energy- and capital-intensive goods required by the military. Massive capital investment, innovative management, and new technologies are required. In economic terms, the resurrection of the U.S. economy can only be accomplished by a directed effort at the development and implementation of new industrial technologies. A properly conceived national budget, especially its military component, must stress an aggressive, innovative R&D policy as the centerpiece of a program for national industrial development. There are four essential components to such a program:

- **Advanced energy production.** Nuclear technologies must be funded at an accelerating rate. Advanced fossil fuel technologies like MHD must be funded (the Stockman budget cut the funding for MHD from \$76 million to zero). Thermonuclear fusion development must be put on a crash program of the sort mandated by the 96th Congress’s passage of the McCormack bill (Stockman’s budget cut more than \$70 million from the legally required budget of \$525 million for fusion research).

- **Space research.** The NASA program for putting a man on the moon resulted in a tremendous boost to the economy. New technologies (“spinoffs”), hundreds of thousands of new engineers, and a national commitment to scientific progress powered the whole U.S. economy through the 1960s. The Stockman budget makes severe cuts in the NASA budget, which will result in delays in the Space Shuttle, a cancellation of all planetary exploration projects, closing of the Jet Propulsion Laboratory, and the delay or cancellation of a multitude of earth-imaging and meteorological programs.

- **Science education.** The most critical component is manpower development. Without scientific and engineering knowhow, economic health is impossible. The longest lead-time item in any bill of materials is the skilled manpower required. The Stockman budget cuts the funding for science education from \$112 million to \$12 million!

- **A military R&D commitment.** One of the most effective ways to direct a program of national reindustrialization is with a well-conceived, imaginative military R&D policy. Space research, high-energy physics, and plasma technologies are all required for successful military research, and receive task orientation from such research. The essential point is that an expanding, vigorous economy, a large and healthy industrial base, and a strong military are inseparable.

Science & Technology

Europe protests U.S. space budget cuts

by Marsha Freeman

In testimony I attended before the space subcommittee of the House Committee on Science and Technology on March 11, Mr. E. Quistgaard, director general of the European Space Agency, expressed the outrage of the 11 member nations of that agency at the proposed budget cuts in the National Aeronautics and Space Administration (NASA). In particular, the ESA was concerned with the cuts dictated by the Office of Management and Budget in the budget request for fiscal year 1982 for the International Solar Polar Mission (ISPM), which is the largest such cooperative program. Since the project requires two identical spacecraft, and one of them was to be built by NASA, dumping the program on the U.S. side would kill the entire scientific mission.

Quistgaard noted that over the last 10 years, Europe has spent \$1.2 billion in cooperative projects with the United States, and never imagined that once NASA had signed a memorandum of understanding on a program that the budget process could simply end it.

Following his testimony, excerpted below, concerned congressmen raised the question of whether the scrapping of the Solar Polar Mission would make the United States an “unreliable partner” in space science cooperation. Mr. Quistgaard emphasized that it would.

My Washington sources report that the European Space Agency has taken its case against the cuts directly to Secretary of State Alexander Haig.

From the Quistgaard testimony

The European director general stated:

“Because it has a bearing on some plain speaking I have to do later, I wish to state at the outset that ESA and its member states are fully committed to the principle of cooperation with the U.S. in space activities. Indeed, over the past 10 years, Europe has spent over \$1.2 billion in cooperative projects with NASA.

"You will understand that I cannot but start with space science, and with the International Solar Polar Mission, ISPM, in particular.

"ISPM is a cooperative ESA/NASA venture, in which two spacecraft, one developed by ESA and the other developed by NASA, are to be launched by the [Space] Shuttle. Their trajectories will take them on paths that will overfly the poles of the Sun after using Jupiter's high gravity as an accelerating force to throw them out of the ecliptic plane. This is the first time ever that a spacecraft will go out of the ecliptic plane.

"ISPM has been under a bad spell almost from the beginning. . . . The latest and most serious blow to the ISPM program and to the European scientists involved came on Feb. 20 of this year when NASA informed ESA, without prior consultation, that the U.S. spacecraft would be deleted.

"It is clear that the scientific value of the mission would be substantially affected by the withdrawal of the U.S. spacecraft, eliminating the possibility of simultaneous measurements over the polar regions of the Sun, a crucial feature of the mission. European scientists from no less than 17 scientific institutes who are participating in experiments to be flown on the NASA spacecraft would no longer be able to fly them. This will have profound consequences on the long-term research activity of these groups, and nullify the efforts already invested in the mission.

"The financial consequences of a cancellation of the U.S. spacecraft would also be serious. European investment in the overall program amounts to approximately \$200 million, of which over \$100 million, equivalent to almost the whole of the agency's annual budget for space science, has already been committed. This investment was judged against anticipated scientific objectives which would now be seriously degraded.

"Furthermore, the funds already spent by the European scientists participating in the U.S. spacecraft amount to approximately \$15 million. This sum would be irretrievably lost.

"NASA has not excluded the possibility of maintaining support for the European spacecraft foreseen in the Memorandum of Understanding; however, it cannot be taken for granted that the ESA Science Programme Committee will decide to maintain the ESA spacecraft alone if the cancellation of the NASA spacecraft is upheld.

"As you may have heard, the governments of the 11 member states of the European Space Agency and ESA itself have voiced strong objections to this unilateral withdrawal. It cannot, in fact, be accepted that at such an advanced stage of development, and after the commitment of more than half of the European funding, NASA presents ESA with the fait accompli of its withdrawal from an international cooperative program,

and this without prior consultation.

"The short-term financial advantage to NASA arising from this action may well, in the long term, cost them many millions of dollars, since the present unilateral withdrawal from a cooperative venture cannot fail to have adverse consequences on potential future undertakings of this nature. In Europe's view, international cooperation, in terms of financial constraints, is essential to carrying out cost-effective programs with limited resources.

"In this context, I have to say that when the ISPM project was decided upon by ESA, it was chosen in preference to a number of other, purely European, missions, because of the value ESA attaches to transatlantic cooperation.

"In summary, we consider that the scientific value of the dual spacecraft mission is outstanding and that it is an essential mission in space research that will inevitably have to be carried out in future."

Congressional response

Following this testimony, the subcommittee chairman, Ronnie Flippo (D-Ala.) stated: "The NASA programs have the support of this committee. When the International Solar Polar Mission [ISPM] was threatened last year we cooperated to continue funding for ISPM. Is there a fallback position for the U.S. in ISPM if we do not build the second craft? Could NASA provide instruments for the mission for ESA, or could we launch our part at a later date?"

Quistgaard responded that "there is no fallback. You need two spacecraft on the mission. If only the ESA craft were to be launched, we have to reconsider the program. It would be less than 50 percent effective with one craft."

In reply to an inquiry from Representative McGrath, Quistgaard explained that the funding for ESA is about \$700 million for fiscal 1981. "Our funding is committed over the life of a program; there are no yearly funding allocations that are not agreed on for a specific program." Rep. Michael Lowry (D-Wash.) then asked about the impact of the proposed U.S. space budget, and Quistgaard reiterated: "We are very concerned. We had ground to think that when we made an agreement with NASA they would continue the program. Up until last May we never thought NASA might pull out. In times when funds are scarce, cooperative ventures will give a greater value to programs than either program alone."

I also got the clear impression from the director general's exchange with the congressmen that Europe plans to use the French Ariane rocket as a launch vehicle, especially if the U.S. shuttle launches are unreliable, in meteorological and communications satellite efforts.