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SPACE STATION FREEDOM RESTRUCTURING PLAN COMPLETED

NASA today delivered the "restructuring" report to the Congress, outlining an extensive redesign of the Freedom space station. The new design is cheaper, smaller, easier to assemble in orbit and will require fewer Shuttle flights to build.

Major new features of the redesigned space station - shorter U.S. laboratory and habitat modules that can be outfitted and verified on the ground and a pre-integrated truss that can be assembled on the ground and tested with all of its subsystems intact - will significantly reduce intravehicular activity (IVA) and on-orbit extravehicular activity (EVA) needed to build and maintain Freedom.

"This new design for Space Station Freedom accomplishes every major goal we set for ourselves when we kicked off this effort last November," said William B. Lenoir, Associate Administrator for Space Flight. "We took the directions from Congress and the Augustine Commission recommendations to heart, and the program we are announcing today addresses each and every one of their requirements.

"We've cut costs, simplified the design and reduced the complexity of the project. At the same time, Freedom will be a quality facility, providing a research laboratory unsurpassed in the world for life sciences and microgravity research, and a stepping stone into the future, enabling NASA to conduct the research and planning necessary for human exploration of the solar system. And, we have maintained our international commitments," he continued.

A 1991 fiscal year budget shortfall of more than \$550 million, along with Congressional directions to significantly reduce out-year spending, prompted NASA to begin the restructuring of Freedom. Congress told NASA to expect no more than 8 to 10 percent growth over the next 5 years (FY 1992-1996), with peak spending for Freedom not to exceed \$2.5-2.6 billion. The budgetary ground rules, including the cut for FY 1991, represent a \$5.7 billion shortfall from what NASA had planned to spend for Freedom over that same time period.

NASA directed the review in November 1990 with instructions to the Freedom project team to: develop a phased approach with quasi-independent phases; protect life and materials science; maintain international agreements and capability; limit assembly flights to no more than four annually; and achieve first element launch, man-tended capability and permanently manned capability as early as possible.

The restructured program calls for the first element launch of the space station to be made in the second quarter of FY 1996 (January - March 1996), and man-tended capability to be achieved in the third quarter of FY1997 (April-June 1997).

In the man-tended phase, astronauts brought up to Freedom by the Space Shuttle will be able to work inside the U.S. laboratory for periods of 2 weeks. They will return to Earth with the Shuttle. At this stage, one set of Freedom's solar arrays will generate about 22 kw of power with a minimum of 11 kw available to users. Six Shuttle flights will be required to achieve the man-tended configuration.

Freedom will achieve a permanently manned configuration in Fiscal Year 2000. This configuration will consist of the U.S. laboratory and habitat, as well as the European and Japanese laboratories; the Canadian Mobile Servicing System; accommodations for a live-in crew of four; and three sets of solar arrays furnishing 65 kw of electrical power, with a minimum of 30 kw going to the users and the remainder to housekeeping chores.

A new requirement before permanently occupying the station will be the availability of an Assured Crew Return Vehicle to return space station crew members to the Earth in an emergency. Seventeen Shuttle flights will be needed to build the permanently manned configuration.

Provisions to expand the space station have been maintained. The follow-on phase of the Freedom program will include another solar array to achieve 75 kw, provisions for 4 additional crew members and could include additional capabilities such as a second preintegrated laboratory and additional nodes. This phase would use the new launch system for launch and assembly if the launch system is available.

The redesigned U.S. lab and hab modules are 27 feet long and 14.5 feet in diameter, about 40 percent shorter than the previous design. The smaller size allows the modules to be fully outfitted and tested on the ground prior to being launched into orbit. The U.S. lab module will hold a total of 24 8-foot wide racks, 15 of which initially are devoted to scientific work. At permanently manned capability, 28 experiment racks will be available to U.S. investigators: 12 in the U.S. lab, 11 in the ESA lab and 5 in the Japanese lab.

The redesigned truss segments will be built, preassembled and checked out on the ground. Formerly, the truss was to have been

assembled, like a massive erector set, by astronauts performing space walks. NASA estimates the pre-integrated truss will cut assembly EVA by more than 50 percent.

While work on the Attached Payload Accommodations Equipment (APAE) suitable for large external payloads has been stopped, utility ports for small external payloads will be placed along the truss. The overall width of the station has been reduced from 493 feet to 353 feet.

Complexity of other station systems also has been reduced and where possible, hardware already flying on the Space Shuttle will be used in place of developing new hardware for the station. Also called for in the plan is the transfer of the Flight Telerobotic Servicer to NASA's Office of Aeronautics, Exploration and Technology. This, together with the deferral of the APAE, has eliminated the Goddard Space Flight Center's Work Package 3 from the Freedom program.

In addition to changes to the flight hardware, a number of changes to ground facilities are planned. The Space Station Processing Facility to be built at the Kennedy Space Center will not be fully outfitted, and a new hazardous processing facility has been deleted in favor of using an existing facility. The size of planned facilities at the Johnson Space Center - the control center and crew training facilities - have been scaled back. Payload facilities at Marshall Space Flight Center are being deferred and existing facilities will be used in the interim.

Due to funding cutbacks and hardware changes in the program, some layoffs of prime and subcontractor personal have already taken place, and more are expected. At Work Package 1, no layoffs at the prime contractor, Boeing, are expected, but more than 500 people will be reduced from the subcontractor roles, some of which will be accommodated through transfers and attrition.

At Work Package 2, prime contractor McDonnell Douglas has already reduced its work force by about 160, with half that number being layoffs. Major subcontractors to McDonnell Douglas will be reduced by about 470, with layoffs accounting for approximately half of that, and another 200 will be reduced from supporting development, with about 65 of that total coming from terminations. At Work Package 4, no layoffs are expected, but as many as 40 people in support jobs at Lewis Research Center will be reassigned. Layoffs of about 30 percent of the work force at the Space Station Engineering and Integration Contractor, Grumman, were announced earlier this month.

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Three photographs to illustrate this news story are available to media representatives from the NASA Headquarters Audio/Visual Section by phoning 202/453-8373.

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