

GAO

Briefing Report to the Ranking Minority Member, Subcommittee on Science, Technology and Space, Committee on Commerce, Science and Transportation, U.S. Senate

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May 1995

# NASA BUDGETS

## Gap Between Funding Requirements and Projected Budgets Has Been Reopened







United States  
General Accounting Office  
Washington, D.C. 20548

National Security and  
International Affairs Division

B-260434

May 12, 1995

The Honorable John D. Rockefeller, IV  
Ranking Minority Member  
Subcommittee on Science, Technology  
and Space  
Committee on Commerce, Science  
and Transportation  
United States Senate

Dear Senator Rockefeller:

You asked us to (1) identify the nature and scope of the adjustments the National Aeronautics and Space Administration (NASA) had made to reduce or eliminate the gap between required funding and likely future budgets that we had previously identified and (2) determine whether any gap remained between NASA's program plans and its likely future budgets.

On April 27, 1995, we briefed your staff on the results of our work. This report summarizes the information presented during that briefing.

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## Results in Brief

Recent events have reopened a gap between NASA's program plans and its likely budgets. NASA has not yet developed plans for closing this \$5.3-billion gap projected for fiscal years 1996 through 2000. NASA closed the gap that we reported in 1992 primarily by changing and/or deleting some of its major programs. As a result of these changes, NASA increased the risks in several of its largest programs.

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## Budget Gap Is Reopened

In 1992,<sup>1</sup> we reported that NASA's funding estimates for fiscal years 1993 through 1997 exceeded its likely budgets for those years. We estimated that if the current federal budget allocation for domestic discretionary spending continued to be constrained, NASA would have to reduce its program plans by \$13 billion to \$21 billion to match the available budgets.

Since submitting its 1993 preliminary estimates, NASA has reduced its 5-year program plans by about \$20 billion, or almost 22 percent. In its fiscal year 1996 budget request, NASA estimated its funding requirements would be \$72.4 billion for fiscal years 1996 through 2000. NASA

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<sup>1</sup>NASA Budget: Potential Shortfalls in Funding NASA's 5-Year Plan (GAO/T-NSIAD-92-18, Mar. 17, 1992) and NASA: Large Programs May Consume Increasing Share of Limited Future Budgets (GAO/NSIAD-92-278, Sept. 4, 1992).

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accomplished these reductions through a variety of techniques such as eliminating some programs, scaling down program scopes, identifying program efficiencies, stretching some programs beyond the 5-year planning period, and reducing the number of civil service personnel. In some cases, NASA has accepted higher program risk to achieve the budget reductions. For example, reductions in the space shuttle program have increased the risk of delays in meeting projected launch schedules. The \$20-billion reduction is based on the assumption that NASA can reduce shuttle operating costs another \$1.3 billion through fiscal year 2000.

Reductions in current programs and activities were actually more than \$20 billion because the fiscal year 1996 budget plans included nearly \$3 billion for new programs. These new programs include the new millennium spacecraft; technology development for a new reusable launch vehicle to replace the shuttle; the Space Infrared Telescope Facility to complement both the Hubble Space Telescope, already in orbit, and the Advanced X-ray Astrophysics Facility, planned for launch in 1998; and the Stratospheric Observatory for Infrared Astronomy, a suborbital observatory.

In addition, NASA was required to plan for a continuing loss of purchasing power due to inflation. Future budgets are not expected to cover anticipated inflation and, in fact, the budgets are actually decreasing. Using the gross domestic product deflator forecasts from the President's fiscal year 1996 budget, we estimate that NASA will lose \$3.8 billion in purchasing power in fiscal years 1996 through 2000 because of inflation. NASA accounted for this reduction when it prepared the fiscal year 1996 plans.

Even though NASA reduced its 5-year funding requirements, it still has a \$5.3-billion gap between estimated funding requirements and projected budgets. NASA's fiscal year 1996 budget request includes over \$4 billion in "unresolved percentage reductions." This gap occurred because in January 1995—just before the President's budget was submitted to the Congress—NASA and other agencies were directed to make additional funding reductions. Specifically, NASA was directed to freeze its budget at the 1996 funding level—\$14.3 billion—and make increasingly larger reductions from that level for each year from 1997 through 2000. Under this plan, the agency's budget would be reduced from \$14.3 billion in fiscal year 1996 to \$13.2 billion in fiscal year 2000. The cumulative reductions totaled \$4 billion for the 5-year period. The plan included another

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\$1.3 billion in unresolved reductions in the shuttle program, making a budget gap of \$5.3 billion.

NASA has not yet determined how it will accomplish the \$5.3 billion in unresolved reductions. A number of studies have been completed or are underway on how to make the reductions. For example, an internal shuttle workforce review and an independent management review have recommended changes to reduce shuttle costs, but NASA has not acted on all of the recommendations and has no estimate of the potential savings. The NASA Administrator testified that he would try to take the bulk of the reductions from NASA's infrastructure costs and would reduce programs only as a last resort. A recent study by an independent task force for NASA's Advisory Council<sup>2</sup> endorsed this approach. The task force cautioned, however, that even with this approach, it believed NASA would have to terminate some of its lower priority objectives. The Administrator is awaiting the results of an internal zero-base study before making final decisions on the cuts. He expects these results in mid-May 1995.

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## Scope and Methodology

To determine how NASA reduced its 5-year funding requirements, we compared preliminary program plans NASA prepared for use in negotiations with the Office of Management and Budget (OMB) for the fiscal year 1993 budget request to program planning estimates contained in the fiscal year 1996 budget request. We used the fiscal year 1993 preliminary program plans as our baseline because the President's fiscal year 1993 budget submission omitted the out-year funding profiles and our 1992 reports were based on the preliminary plans. Our comparisons were further complicated by the fact that, in fiscal year 1995, NASA changed its budget structure. This change limited the level of detail of our comparisons.

Because of the comparison difficulties, we selected five of NASA's largest programs for detailed review. These programs were the space station, space shuttle, Earth Observing System, Cassini, and Advanced X-ray Astrophysics Facility. Together with the civil service personnel reductions, these programs accounted for about \$13 billion of the \$20 billion reduction and represent about 56 percent of NASA's fiscal year 1996 5-year program estimates. We reviewed program and budget documents, internal and external management studies, and our prior reports on these programs and discussed the reductions with NASA program and budget officials. A list

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<sup>2</sup>NASA Federal Laboratory Review Task Force, NASA Advisory Council, NASA Federal Laboratory Review (Feb. 1995).

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of issued GAO products related to NASA's budget and the programs mentioned above is at the back of this report.

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## Agency Comments


We discussed the contents of our draft report with NASA officials and incorporated their technical comments and clarifications where appropriate. The NASA officials stated that they believed the report was well balanced and represented NASA's budget situation.

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We are sending copies of this report to the NASA Administrator and interested congressional committees. We will also provide copies to others upon request.

Please contact me at (202) 512-8412 if you or your staff have any questions concerning this report. Major contributors to this report were Lee Edwards, Galen L. Goss, Pauline Nowak, and Bonita Page.

Sincerely yours,



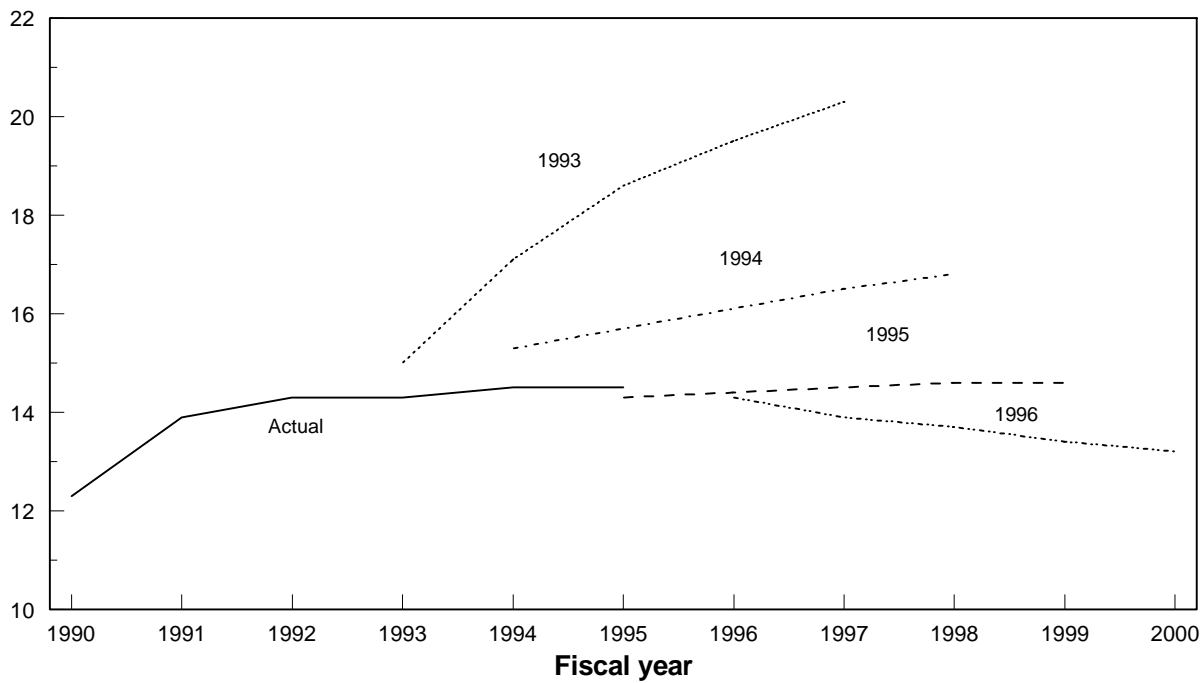
David R. Warren  
Director, Defense Management  
and NASA Issues



# NASA Budget Gap

## GAO Five-Year Program Plans by NASA - 1993-96 (by fiscal year)

Dollars in billions





- The National Aeronautics and Space Administration's (NASA) preliminary program plan for fiscal years 1993 through 1997 would have required increasing the agency's annual budget from \$15 billion in fiscal year 1993 to about \$21 billion in fiscal year 1997. We estimated the cumulative funding requirements exceeded likely budgets by \$13 billion to \$21 billion.
- The plan submitted with the fiscal year 1994 budget (fiscal years 1994 through 1998) called for a cumulative 5-year total of \$12 billion less than the 1993 plan, but still provided for annual increases in the budget.
- The fiscal year 1995 plan (fiscal years 1995 through 1999) included further cumulative cuts of about \$8 billion. It provided for essentially level budgets of about \$14.5 billion per year through fiscal year 1999.
- Without the percentage reductions added in January 1995, just before the President submitted the fiscal year 1996 budget to the Congress, the fiscal year 1996 plan (fiscal years 1996 through 2000) would have provided for nearly the same level budget as the fiscal year 1995 plan. NASA's planned funding for fiscal years 1996 through 2000 totaled \$72.4 billion—about \$20 billion, or 22 percent less, than the plan for fiscal years 1993 through 1997. The unresolved percentage reductions in the 1996 President's budget for NASA will decrease funding by another \$4 billion in fiscal years 1997 through 2000. With the percentage reductions, the fiscal year 1996 plan provides for budgets that will steadily decrease from \$14.3 billion in fiscal year 1996 to about \$13.2 billion in fiscal year 2000.

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GAO Budget Gap Reopened  
(5-year totals)

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1993 Budget Gap      \$13 to \$21 billion

1996 Budget Gap

- Unresolved in shuttle      \$1.3 billion
  - Unresolved percentage  
  reduction in budget      4.0 billion
- \$5.3 billion
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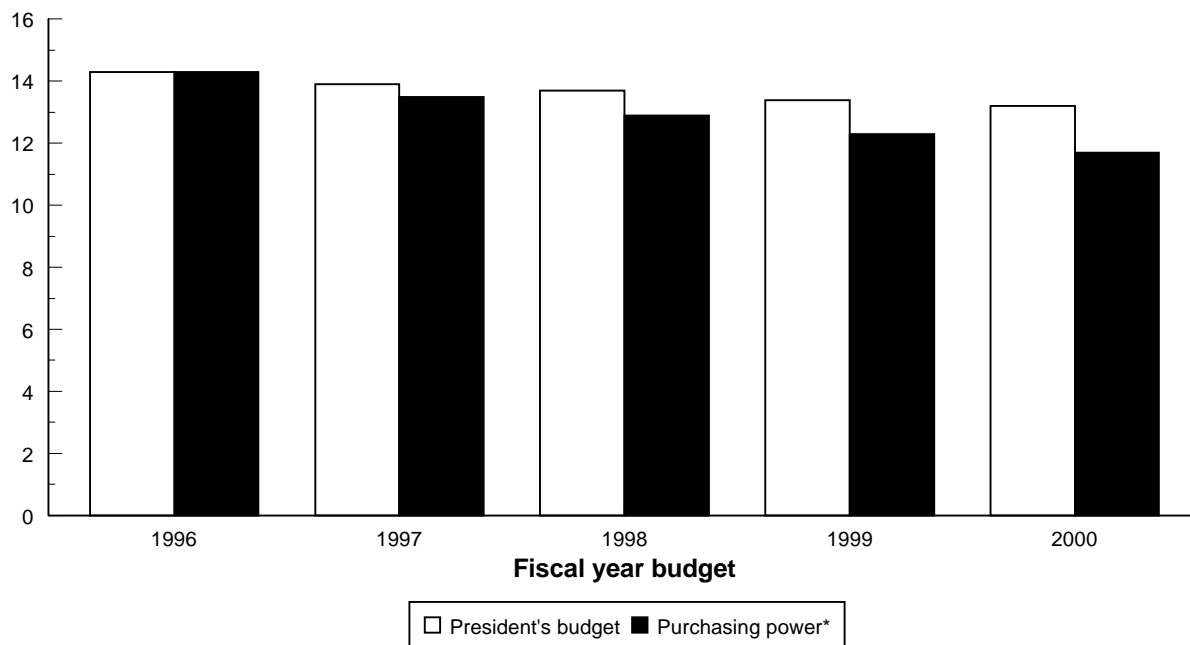
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In 1992, we reported that NASA's funding estimates for fiscal years 1993 through 1997 exceeded its likely budgets for those years by \$13 billion to \$21 billion. NASA has reduced its 5-year funding requirements, but a \$5.3-billion gap between estimated funding requirements and projected budgets for fiscal years 1996 through 2000 has been reopened.

The gap is composed of \$1.3 billion in unresolved reductions in the shuttle program and \$4 billion in "unresolved percentage reductions" in the fiscal year 1996 President's budget. In preparing its fiscal year 1996 budget, NASA was directed to freeze its budget at the 1996 funding level—\$14.3 billion—and make increasingly larger reductions from that level for each year from 1997 to 2000. The cumulative reductions totaled \$4 billion for the 5-year period.

# GAO Declining Budget; Declining Purchasing Power

Dollars in billions



\*Purchasing power in constant 1996 dollars

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In preparing its fiscal year 1996 budget out-year program plan, the Office of Management and Budget (OMB) directed NASA not to increase funding to account for inflation. As a result, NASA formulated the plan based on reduced purchasing power. Using the gross domestic product deflator forecasts in the President's budget, we estimate that NASA will lose a cumulative total of \$3.8 billion in purchasing power for fiscal years 1997 through 2000 due to inflation. For example, NASA's budget is projected to decrease from \$14.3 billion in fiscal year 1996 to \$13.2 billion in fiscal year 2000, a reduction of about 7.7 percent. However, the fiscal year 2000 budget equates to \$11.7 billion in constant fiscal year 1996 dollars, a reduction in purchasing power of almost 18 percent.

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GAO Funding Changes for Programs  
Reviewed (dollars in billions)

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	Fiscal year 1993 (5-year total)	Fiscal year 1996 (5-year total)	Change
Shuttle	\$22.9	\$16.5	-\$6.4
Space Station	13.0	8.6	-4.4
EOS	5.3	5.1	-0.2
AXAF	1.7	0.8	-0.9
Cassini	1.4	0.5	-0.9
Civil service personnel	9.1	9.0	-0.1
Total	\$53.4	\$40.5	-\$12.9

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To determine how NASA reduced its 5-year funding requirements, we selected five of NASA's largest programs and the civil service personnel account for detailed review.<sup>1</sup> Together, these activities accounted for almost \$13 billion of the \$20 billion reduction from the 1993 plan to the 1996 plan. Moreover, these six activities represent about 56 percent of NASA's fiscal year 1996 5-year program estimates.

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<sup>1</sup>Comparisons of cost and program elements among the programs cannot be made because costs change as a program moves from early design through development, launch, and operation.

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GAO Space Shuttle

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- Eliminated some planned upgrades
  - Reduced flight rate from 10 to 7 a year
  - Reduced reserves
  - Created program efficiencies
  - Maintained unresolved reductions of \$1.3 billion
  - Increased schedule risk with reductions
-



The space shuttle, NASA's costliest program, has also accounted for about half of the cost reduction effort. Shuttle costs were lowered primarily by eliminating some planned upgrades, reducing the flight rate, reducing funding reserves, and improving operational efficiency. NASA eliminated its expensive upgrades and used already existing less costly alternatives, as well as canceled its structural spares program. For example, NASA canceled the advanced solid rocket motor program, which saved about \$1.4 billion, and continued to use the reliable existing motors. Some upgrades (e.g., the super lightweight external tank needed to support space station assembly) were added after the fiscal year 1993 plan, but they were less costly than the ones terminated.

NASA also reduced the planned flight rate from 10 to 7 per year. According to a December 1994 study by the National Academy of Public Administration, reducing the flight rate by one flight saves about \$100 million per year. NASA and its contractors also improved the efficiency of shuttle operations and, as a result, reduced contractor labor by over 20 percent.

Although shuttle costs have been reduced, internal documents show that estimated costs still exceed planned funding by \$1.3 billion for fiscal years 1996 through 2000. A February 1995 NASA workforce review and an independent management review recommended changes to further reduce costs, but NASA has not made any decisions.

According to the workforce review, the cost reductions have increased the risk that NASA will not meet future flight schedules, but the review did not quantify the added risk. Also, canceling the structural spares program would increase NASA's response time if a shuttle is damaged or destroyed and would result in the loss of some personnel with skills that would be needed if another shuttle had to be produced. According to NASA, the skills could be reacquired, but would increase the time for producing a replacement shuttle. However, NASA considers this risk to be minimal because it has no plans to build another orbiter.

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## GAO Space Station

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- Redesigned station to reduce and control costs
  - Funding capped at \$2.1 billion per year
  - Restructured program management
  - Renegotiated development contract
  - Potentially increased risk through redesign and Russian participation
-

NASA reduced space station costs from the fiscal year 1993 program estimate by (1) redesigning the station and expanding Russia's role in the space station program by including it in the international partnership and (2) consolidating program management and restructuring station development contracts.

In 1993, the President directed NASA to redesign the station program to reduce costs. Subsequently, the United States and Russia agreed to bring Russia into the partnership. The resulting station configuration is based on a modular concept with a phased buildup. The new design deleted some hardware (e.g., a pressurized logistics module) and replaced some development efforts with already proven equipment (e.g., a Russian tug for guidance, navigation, and control). In addition, the administration imposed an annual station funding cap of \$2.1 billion through fiscal year 1998,<sup>2</sup> which reduced the planned level of funding.

To gain efficiencies, NASA implemented a new management approach: a single prime contractor (Boeing) was given total prime contractor responsibility. Other previous prime contractors and support contractors became subcontractors to Boeing. Additionally, NASA reduced the combined contractor workforce. NASA also streamlined its program management office and merged headquarters program management with the space shuttle program. A consolidated program management office was located at the Johnson Space Center, and project management organizations at the various centers were eliminated.

In January 1995, NASA and Boeing signed the restructured contract for \$5.6 billion—about \$600 million less than the original estimate. However, Boeing has not yet completed negotiations with its major subcontractors. And one provision of the restructured contract allows Boeing to reopen negotiations if it is unsuccessful at negotiating subcontract prices within the \$5.6-billion price.

The redesign may have increased program risks because (1) the new design will require a number of modifications to the shuttle to increase its performance because of the station's higher inclination and resulting shuttle payload weight loss, (2) more flights will be required for station assembly, and (3) the program depends, to some extent, on Russian participation.

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<sup>2</sup>The funding cap excludes the \$400-million contract with the Russian Space Agency for hardware and services.

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GAO Earth Observing System (EOS)

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- Revised program twice
  - Delayed some flights
  - Reduced algorithm development and standard data products
  - Increased reliance on international participants
  - Decreased science content
  - Reduced funding reserves
-

The Earth Observing System (EOS) is a series of polar-orbiting and low-inclination satellites that will gather information on the Earth's environment and climate until about 2021. It will take 2 years after the satellites' instruments have finished gathering information to analyze it.

Between the time the fiscal years 1993 and 1996 budget plans were prepared, NASA revised the EOS program twice to reduce funding requirements. The first revision reduced funding for fiscal years 1991 through 2000 by \$3 billion—from \$11 billion to \$8 billion. The second revision reduced funding another \$750 million—from \$8 billion to \$7.25 billion. The two revisions (1) reduced the program's scope, (2) increased program reliance on international partners, (3) stretched out the program, (4) delayed availability of some data, and (5) reduced program funding reserves from 28 percent to 23 percent.

To achieve cost reductions, NASA deleted some planned measurement instruments, such as the High-Resolution Imaging Spectrometer, originally estimated to cost between \$413 million and \$434 million through fiscal year 2000. It also reduced the development of algorithms, which translate raw data into useful information, and the program's number of standard data products from 512 to 222. In addition, NASA slipped the launch of some planned instruments and increased the time between launches of replacement spacecraft from 5 years to 6 years, thus saving about \$187 million through 2000. However, it increased the risks of in-orbit failure and lost data. In revising EOS, NASA also increased its reliance on international partners.

Although NASA reduced its 1991 to 2000 costs by \$3.75 billion, the 1996 5-year funding total is only \$200 million less than the 1993 total. This difference occurs because development will be more intense and costly in fiscal years 1996 to 2000 than in 1993 to 1997.

According to a July 1994 NASA report, the cost reductions have adversely affected both the program's science content and its schedule. Reducing the funding reserves increased the risk that instruments will not be available on schedule or will not achieve their planned capabilities. In addition, since agreements with other agencies and international partners are not finalized, risks increase that equipment and data may not be available when needed.

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GAO Advanced X-ray Astrophysics Facility  
(AXAF)

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- Development to be completed in fiscal year 1998
  - Split mission into two parts
    - AXAF-I designed as smaller satellite in higher orbit
    - AXAF-S spacecraft terminated
  - Increased technical risk because of higher orbit
-

The Advanced X-ray Astrophysics Facility (AXAF) is the third in NASA's series of four "great observatories." These observatories are intended to provide new data and insights for studies of the age, evolution, and composition of the universe and its objects.

The \$900-million reduction in AXAF's 5-year funding requirements resulted from progress in the development program and NASA's redesign of the observatory to make its development and operation less costly. In the fiscal year 1993 plan, NASA estimated it would need \$1.7 billion for fiscal years 1993 through 1997. Much of these costs were for development. By the 1996 program plan, NASA estimated funding requirements totaling about \$800 million for fiscal years 1996 through 2000. As the 1996 5-year period ends, AXAF will have moved from development to operations.

At the time of the 1993 plan, AXAF was a single large satellite that would be launched in 1999 and operate in low Earth orbit for 15 years. The shuttle was to rendezvous periodically with AXAF to maintain and service it. After submitting the fiscal year 1993 budget, NASA concluded that AXAF was not affordable and divided the program into two separate satellites or missions: AXAF-I (imaging) and AXAF-S (spectroscopy). The redesign reduces AXAF's life-cycle costs by about \$3 billion, allows NASA to complete development and launch the spacecraft in fiscal year 1998 (a year earlier), reduces the operating life from 15 to 5 years, and places it in a high Earth orbit. In 1994, the Congress terminated funding for the spacecraft portion of AXAF-S—saving \$393 million in development and operational costs—and directed NASA to investigate whether the primary instrument could be included on a future Japanese mission.

Although redesigning the AXAF mission reduced costs, it also increased the risks. For example, since AXAF-I will no longer be serviceable in space because of the higher orbit, technical problems that cannot be corrected through ground communications could degrade or destroy the mission. In addition, the redesign will result in less science data being collected because AXAF will achieve 10-years equivalent observing time in 5 years with the high orbit, due to increased instrument efficiency, as opposed to the 15 years of observing time with the low orbit.

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GAO Cassini

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- Restructured program to reduce costs and satellite size
  - Reduced flexibility because instruments made stationary rather than moveable
  - Revised approach so operations personnel shared with other operations processes
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The Cassini mission is to provide long-term (4 years) observations of Saturn's atmosphere, rings, magnetosphere, and moons. When Cassini development began, the mission included a second spacecraft—the Comet Rendezvous Asteroid Flyby (CRAF). Because the Congress imposed reductions on fiscal years 1992 and 1993 funding, NASA terminated the CRAF portion of the mission and deferred the Cassini launch from April 1996 to October 1997.

Between the fiscal year 1993 plan and the fiscal year 1996 plan, there was a \$900-million reduction. It resulted from (1) a redesign of the spacecraft, project management, and operating approach and (2) completion of much of the spacecraft development.

In 1993, NASA redesigned the CRAF/Cassini mission by replacing the original multimission with a less expensive, less capable Cassini-unique design. NASA also streamlined project management and reduced the number of people working on the project. In 1994, NASA revised its approach to Cassini operations and improved the efficiency of operations personnel by sharing them with other projects rather than dedicating them to the Cassini mission.

The fiscal year 1993 program plan covered 5 years of peak development activity for Cassini. However, by the fiscal year 1996 plan, much of the development activity had been completed, with Cassini scheduled for launch in fiscal year 1998. Funding for fiscal years 1999 and 2000 is for mission operations, data analysis, and tracking and data support.

The 1993 redesign reduced the mission's science capabilities. Although no science instruments were deleted from the project and the mission's primary science objectives were not changed, the new spacecraft design reduced the depth and quality of some planned investigations. With the new design, instruments will be mounted on the spacecraft's body rather than on moveable booms. In many cases, the entire spacecraft will have to move in order to point the instruments, thus reducing the amount and quality of science data that can be obtained. The approach of sharing operations personnel may also increase risks because the right experts might not be available when needed.

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GAO Reductions in Mission Support - Civil  
Service Personnel Costs

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- 1993 5-year budget \$9.1 billion
  - 1996 5-year budget \$9.0 billion  
(real year dollars)
  
  - FTE estimate 1993 24,231
  - FTE estimate 1996 23,028
  - FTE estimate 2000 20,906  
(civil servants)
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The \$100-million reduction in civil service personnel costs will result from cutting the number of civil service personnel by 14 percent, from 24,231 equivalent personnel<sup>3</sup> in fiscal year 1993 to 20,906 equivalent personnel in fiscal year 2000. NASA has already reduced its workforce by about 1,200 from the fiscal year 1993 level and plans an additional reduction of about 2,100 through the end of the century. Most of the personnel reduction resulted from consolidating the space station program management—the number of equivalent civil service personnel dropped from 2,394 in fiscal year 1993 to 1,279 in fiscal year 1995.

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<sup>3</sup>Labor is measured in “equivalent persons.” One equivalent person is equal to the number of hours one person could be expected to work in a year less adjustments, such as for federal holidays.

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GAO New Programs in Fiscal Year 1996  
Plan (5-year totals in millions)

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- New Millennium Spacecraft \$257.0
  - New Launch Vehicle \$1,458.4
  - Space Infrared  
Telescope Facility \$302.7
  - Stratospheric Observatory  
for Infrared Astronomy \$269.7
  - Future Planning \$521.7
-

As with any fiscal year program plan, the fiscal year 1996 through 2000 plan includes several new programs that will require cumulative total funding of \$2.8 billion.

- The new millennium spacecraft will demonstrate how complex scientific spacecraft—such as those required for planetary missions—can be built for lower costs and in less time, but still possess considerable scientific merit. The program’s primary objectives are to increase the performance capabilities of spacecraft and instruments while simultaneously reducing total mission costs.
- The new launch vehicle will include systems engineering and concept analysis, ground-based technology development, and a series of flight demonstrators. In accordance with the August 1994 National Space Transportation Policy, NASA is leading the NASA/industry-funded technology development program for the next generation reusable space transportation system.
- SIRTf (Space Infrared Telescope Facility) will complement the Hubble Space Telescope, the Compton Gamma Ray Observatory, and AXAF, and help provide new data and insights for studying the age, evolution, and composition of the universe and its objects.
- SOFIA (Stratospheric Observatory for Infrared Astronomy) will replace the aging Kuiper Airborne Observatory to study the birth and death of stars, formation of planetary systems, chemical make-up of star-forming clouds in the Milky Way galaxy, energy sources in other galaxies, and outer bodies in our solar system.
- NASA included place-holder funds for new program starts in 1998 through 2000. According to a NASA official, these types of funds were included in prior year’s budget within program offices. NASA used a separate line item in 1996 to ensure that future projects had strategic importance to the agency.

GAO Unresolved Percentage Reduction by  
Budget Account

Dollars in millions

Budget account	Fiscal year			
	1997	1998	1999	2000
<b>Human Space Flight</b> (including reduction)	\$5,443.6	\$5,342.8	\$5,313.5	\$5,177.6
Percentage of total budget	38.0	36.8	36.4	35.2
Percentage of total reduction	25.1	15.9	17.1	21.4
<b>Science, Aeronautics and Technology</b> (including reduction)	\$6,054.1	\$6,260.8	\$6,332.9	\$6,533.1
Percentage of total budget	42.2	43.2	43.4	44.4
Percentage of total reduction	34.8	49.8	49.1	46.5
<b>Mission Support</b> (including reduction)	\$2,819.5	\$2,877.9	\$2,934.6	\$2,969.5
Percentage of total budget	19.7	19.8	20.1	20.2
Percentage of total reduction	39.9	34.0	33.6	31.9
<b>Inspector General</b> (including reduction)	\$17.8	\$18.5	\$19.0	\$19.8
Percentage of total budget	0.1	0.1	0.1	0.1
Percentage of total reduction	0.2	0.2	0.2	0.3

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NASA's fiscal year 1996 budget documentation included a preliminary distribution of the unresolved percentage reductions (\$4 billion) to budget accounts. Under the preliminary distribution, science, aeronautics, and technology activities would absorb about 47 percent of the reductions. The mission support category, which provides funding for NASA's civil service personnel, space communication services, safety and quality assurance activities, and maintenance activities at NASA centers, would absorb about 34 percent. Human space flight activities would absorb about 19 percent; the space station program was exempted from these cuts. According to a NASA budget office official, the ultimate distribution of the reductions may be different than those in the fiscal year 1996 budget documentation.

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GAO Potential Actions to Eliminate Gap

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- Reduce infrastructure
    - Reduce workforce
    - Better focus work at field centers
    - Close facilities
    - Improve efficiency
    - Privatize operations
  - Eliminate or reduce programs
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NASA has a number of options for resolving the remaining \$5.3-billion gap between funding requirements and expected budgets. These options range from reducing the agency's infrastructure to eliminating or reducing programs. Although no final decisions have been made, the NASA Administrator has stated a preference for reducing infrastructure. A number of recently completed or ongoing studies are intended to identify ways to reduce costs. These include the shuttle workforce review completed in February 1995, an independent shuttle management review completed in December 1994, a national facilities study completed in April 1994, an independent NASA laboratory review completed in February 1995, an internal "Red Team" study of the missions of NASA's field centers completed in January 1995, and an ongoing, comprehensive zero-base review of the agency.

According to NASA, the principles guiding these studies include (1) eliminating duplication and overlapping activities, (2) transferring functions to universities or the private sector, (3) changing the way NASA works with prime contractors, (4) emphasizing objective contracting, (5) privatizing and commercializing functions whenever possible, (6) reducing oversight and streamlining procurement, and (7) returning NASA to the role of a research and development agency. Some of these studies contain specific recommendations, but NASA has not acted on all of the recommendations and has no current estimate of the savings expected to result from them. According to the Administrator, if infrastructure reductions do not resolve the gap, the agency will reduce or eliminate some of its programs. According to NASA, final decisions will be reflected in the President's fiscal year 1997 budget request.

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# Related GAO Products

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## Advanced X-ray Astrophysics Facility

Space Projects: Astrophysics Facility Program Contains Cost and Technical Risks (GAO/NSIAD-94-80, Jan. 28, 1994).

Space Projects: Status and Remaining Challenges of the Advanced X-ray Astrophysics Facility (GAO/NSIAD-92-77, Feb. 28, 1992).

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## Cassini

Space Science: Causes and Impacts of Cutbacks to NASA's Outer Solar System Exploration Missions (GAO/NSIAD-94-24, Dec. 29, 1993).

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## Earth Observing System

Earth Observing System: Concentration on Near-Term EOSDIS Development May Jeopardize Long Term Success (GAO/T-AIMD-95-103, Mar. 16, 1995).

Earth Observing System: Information on NASA's Incorporation of Existing Data Into EOSDIS (GAO/IMTEC-92-79, Sept. 25, 1992).

Earth Observing System: Broader Involvement of the EOSDIS User Community Is Needed (GAO/IMTEC-92-40, May 11, 1992).

NASA's Development of EOSDIS (GAO/IMTEC-92-42R, Mar. 23, 1992).

Earth Observing System: NASA Needs to Reassess Its EOSDIS Development Strategy (GAO/T-IMTEC-92-7, Feb. 26, 1992 and GAO/T-IMTEC-92-8, Feb. 27, 1992).

NASA's EOSDIS Development Approach Is Risky (GAO/IMTEC-92-24, Feb. 25, 1992).

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## NASA Budget

NASA: Large Programs May Consume Increasing Share of Limited Future Budgets (GAO/NSIAD-92-278, Sept. 4, 1992).

NASA Budget: Potential Shortfalls in Funding NASA's 5-Year Plan (GAO/T-NSIAD-92-18, Mar. 17, 1992).

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## Space Shuttle

Space Shuttle: NASA's Plans for Repairing or Replacing a Damaged or Destroyed Orbiter (GAO/NSIAD-94-197, July 21, 1994).

Space Shuttle: Incomplete Data and Funding Approach Increase Cost Risk for Upgrade Program (GAO/NSIAD-94-23, May 26, 1994).

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Space Shuttle Main Engine: NASA Has Not Evaluated the Alternate Fuel Turbopump Costs and Benefits (GAO/NSIAD-94-54, Oct. 29, 1993).

Space Transportation: The Content and Uses of Shuttle Cost Estimates (GAO/NSIAD-93-115, Jan. 28, 1993).

Space Shuttle: Status of Advanced Solid Rocket Motor Program (GAO/NSIAD-93-26, Nov. 17, 1992).

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## Space Station

Space Station: Plans to Expand Research Community Do Not Match Available Resources (GAO/NSIAD-95-33, Nov. 22, 1994).

Space Station: Update on the Impact of the Expanded Russian Role (GAO/NSIAD-94-248, July 29, 1994).

Space Station: Impact of the Expanded Russian Role on Funding and Research (GAO/NSIAD-94-220, June 21, 1994).

Space Station: Status of Financial Reserves (GAO/NSIAD-92-279, July 20, 1992).

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### Ordering Information

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