

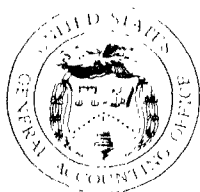
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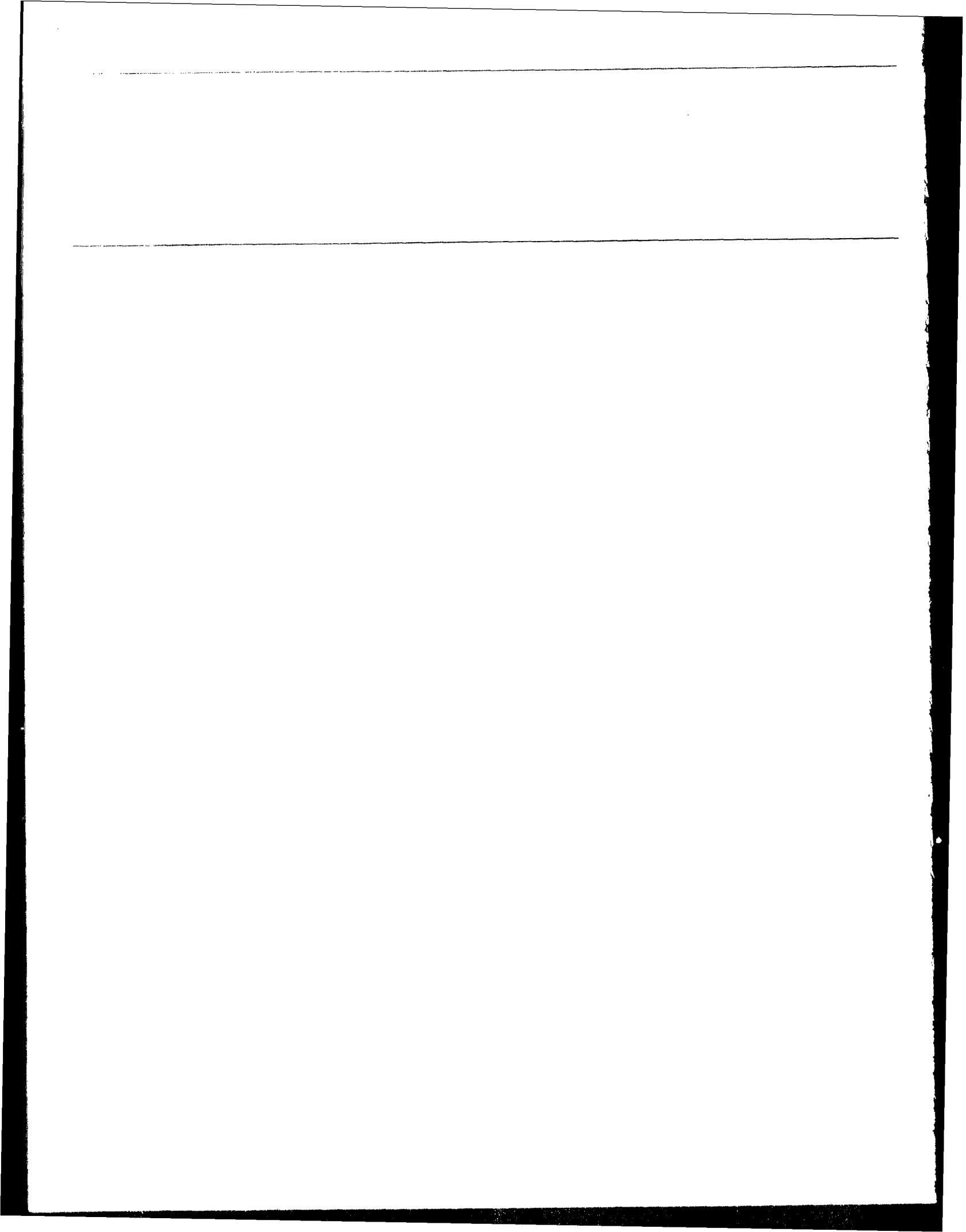
Report to the Chairman, Subcommittee
on Investigations and Oversight,
Committee on Science, Space, and
Technology, House of Representatives

September 1991

NASA PROCUREMENT

Management Oversight of Contract Cost and Time Changes Could Be Enhanced







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

National Security and
International Affairs Division

B-245559

September 30, 1991

The Honorable Howard Wolpe
Chairman, Subcommittee on Investigations
and Oversight,
Committee on Science, Space, and Technology
House of Representatives

Dear Mr. Chairman:

As part of our ongoing review of National Aeronautics and Space Administration (NASA) contract administration and management practices, we estimated the extent of cost increases and time extensions in contracts at NASA's four largest procurement centers—Goddard Space Flight Center, Marshall Space Flight Center, Kennedy Space Center, and Johnson Space Center. After recently briefing representatives from your office regarding the extent of cost increases and time extensions in contracts, they requested a report on the results of our work. Later this year, at your request, we will also report to you the results of our review of NASA's contract administration and management practices.

Results in Brief

Estimates of contract cost increases and time extensions, based on our sample, indicate that about one in every three contracts in the population experienced cost increases and more than two in every five experienced time extensions. The statistical results varied—in some cases, appreciably—across centers, and by type of contract and contract product. For example, contracts at Goddard Space Flight Center showed a noticeably lower annual rate of cost increase than those at the other centers.

We developed our sampling approach because we could not obtain comprehensive information on contract cost increases and time extensions from NASA's centralized database—the Financial and Contractual Status System (FACS). FACS maintains financial and contract data primarily for providing information for planning, budgeting, and accounting for contract resources. FACS was not designed to track contract cost increases and time extensions; however, it does contain the basic data needed and could be enhanced to provide this capability. For example, FACS could be used to track historical changes in overall contract costs and time extensions or to target specific contracts or types of contracts for review.

With modifications to FACS, routine and comprehensive tracking of cost increases and schedule delays could be accomplished without using statistical sampling. Because of the uncertainty of statistical sampling, its usefulness as a general management oversight tool can be limited. We discussed the benefits of analyzing cost increases and time delays on contracts with NASA procurement officials, and they agreed to pursue changing FACS to routinely provide comprehensive information on contract cost increases and time extensions.

Background

NASA historically has spent nearly 88 percent of its funds on procurement of goods and services. During fiscal year 1990, NASA's procurement obligations totaled about \$12.5 billion, an increase of approximately 16 percent over fiscal year 1989. Nearly 72 percent of this recent procurement activity was performed by its four largest centers—Marshall Space Flight Center (25 percent); Johnson Space Center (22 percent); Goddard Space Flight Center (14 percent); and Kennedy Space Center (10 percent).

Given the sizeable growth in the value of contracted activities in the last decade, and the likelihood of continued budget increases, effective contract administration and management practices are essential to ensure that NASA receives the products and services for which it contracts in a timely manner and at a reasonable price. Effective contract administration and management takes on added significance since NASA acknowledges that it has increased its reliance on contractors.

NASA's Office of Procurement conducts surveys of each procurement center approximately every 2 years. As part of these surveys, post-award contract functions are evaluated for compliance with Federal Acquisition Regulations, supplemental NASA procurement regulations, and individual center instructions. Procurement management survey teams use FACS information, as well as data from center-based information systems, for selecting contracts to examine. As a result of these surveys, in 1987 NASA identified contract administration as an area vulnerable to waste and mismanagement. Shortly thereafter, under the Federal Managers' Financial Integrity Act, NASA reported contract administration as a material weakness after the NASA Inspector General found a lack of adequate controls over the agency's management of subcontractors. To help identify and correct contract administration weaknesses within the agency, NASA recently established a group in the Office of Procurement to specifically focus on contract management and administration issues.

Scope and Methodology

We drew a stratified, random sample of 317 active or administratively closed out contracts awarded to businesses between October 1, 1984, and September 30, 1989, as reported by the FACS database, that were available at the four centers. We reviewed the modifications that affected contract value or scheduled completion date to determine the extent of cost increases and time extensions. We included in our analysis all modifications issued and change orders negotiated as of December 31, 1989. We considered exercised options as part of the originally expected cost and time to complete and did not count them as cost increases or schedule delays because they were known at the time the contracts were awarded. We calculated annual rates of cost and schedule changes for each sample contract, for the total sample, and then estimated these rates for the population of contracts.

Appendix I contains eight tables that show the point estimates discussed and the confidence intervals around those estimates. All the confidence intervals shown in these tables are at the 95 percent level of confidence. The sample results obtained should be thought of as intervals where the precise value is highly likely to fall. Throughout the report, point estimates are used for simplicity of presentation. Additional technical information about sample selection and final projections is available upon request. We did not comprehensively test the reliability or accuracy of the FACS database. We did, however, verify with procurement personnel at each of the centers that the contracts selected for review were valid selections.

We performed our work at NASA Headquarters, Washington, D.C.; Goddard Space Flight Center, Greenbelt, Maryland; Marshall Space Flight Center, Alabama; Kennedy Space Center, Florida; and Johnson Space Center, Houston, Texas. Our work was conducted from November 1990 to May 1991 in accordance with generally accepted government auditing standards.

Estimated Contract Cost Increases and Schedule Delays

The FACS database contained 1,825 contracts, with an estimated award value of nearly \$19 billion, that met our selection criteria at the four centers reviewed. Based on a scientifically selected sample of 317 of these contracts, we estimated center-specific and total numbers of contracts experiencing cost increases and time extensions and the annual rates of such increases and extensions. We also estimated cost increases and time extensions by basic type of contract—cost reimbursable or fixed price—and by contract product category—Research and Development, Service, or Supplies and Equipment.

We estimated that 591, or 32 percent, of the contracts at the four centers increased in cost (app. I, table I.1). Overall, contract cost grew by \$257 million annually or at the annual rate of 1.4 percent. The Kennedy and Johnson Centers have the highest overall annual cost increase rates, with 6.6 percent and 2.7 percent, respectively. On the other hand, the Goddard Center's overall rate was noticeably lower than those at the other three centers (app. I, table I.3).

We also estimated that 755, or 41 percent, of the contracts experienced schedule and delivery date extensions. We estimated that, for all contracts, the average annual extension rate was almost 9 percent. In other words, for each year in the lifetime of a contract, an average delay of 9 percent can be expected (app. I, table I.4).

Of the contract population, 1,075, or 59 percent, were fixed price contracts. These contracts were estimated to have increased in cost by 3.6 percent annually. In contrast, cost-reimbursable contracts were estimated to have had an appreciably lower annual rate of increase of 1.2 percent (app. I, table I.5). In addition, the annual time extension rates were 12.6 percent for fixed price contracts, materially higher than the 6.2 percent rate for cost-reimbursable contracts (app. I, table I.6).

NASA categorizes its contract products by the type of service provided. Contract products are classified as Research and Development, Service, or Supplies and Equipment. Service contracts in our population were estimated to have experienced an annual rate of cost increase of 4.7 percent, an appreciably higher rate than those estimated for the other two types of contract products (app. I, table I.7). For time extensions, Supplies and Equipment contracts had an estimated annual rate of delay of over 16 percent, more than twice the rates of delay for contracts in the Research and Development or in the Service categories (app. I, table I.8).

Some FACS Changes Would Be Needed to Identify Contract Cost Increases and Schedule Delays

Currently, NASA does not know the extent of cost increases and time extensions being experienced under its contracts. We believe that this type of information could be used to help procurement managers (1) monitor, over time, changes in values and rates of contract cost increases and time extensions within and across centers, (2) analyze post-award contract administration workload at the centers, and (3) target specific contracts or types of contracts for review to identify whether cost increases and time extensions are related to contract administration problems. However, FACS was not designed to, nor can it, routinely provide accurate and complete information on the extent of

cost increases and time extensions on NASA contracts. The variables needed to compute cost increases and changes in original schedule contract completion dates were not defined in the data system or had missing values that prevented the computation of overall contract cost increases and time extensions. NASA officials acknowledged the existence of these conditions and attributed the situation to the way FACS is currently designed. The officials said that the information needed to determine and analyze contract cost increases and time extensions is available in the current system, but that programming changes would be necessary before the information could be compiled and analyzed.

NASA procurement officials agreed to examine the extent and cost of FACS changes that would be needed to routinely derive comprehensive information on the cost increases and time extensions being experienced on NASA contracts.

Recommendations

We recommend that the Administrator, NASA, direct the Office of Procurement to examine the extent of changes necessary to enhance FACS to routinely and comprehensively provide information on contract cost increases and time extensions, and to implement such changes, if it would be cost effective to do so.

Agency Comments

NASA believes that the recommended enhancement of the FACS system would help improve the agency's ability to monitor contract cost and schedule changes. NASA agreed with our recommendation and noted that its initial assessment indicates that the necessary changes to FACS could be accomplished without extensive changes to the system. Agency comments appear in appendix II.

As arranged with your representatives, unless you publicly announce its contents earlier, we plan no further distribution of this report until 30 days after its issue date. At that time, we will send copies to the Chairmen, House and Senate Committees on Appropriations; Senate Committees on Governmental Affairs and Commerce, Science, and Transportation; House Committee on Government Operations; the Administrator, NASA; and the Director, Office of Management and Budget. Copies will also be made available to other interested parties upon request.

Please contact me at (202) 275-5140 if you or your staff have any questions concerning this report. Other major contributors to this report are listed in appendix III.

Sincerely yours,

Mark E. Gebicke

Mark E. Gebicke
Director, NASA Issues

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Abbreviations

FACS	Financial and Contractual Status System
NASA	National Aeronautics and Space Administration

Selected Estimates of Time and Cost Increases in Contracts Awarded by NASA's Four Largest Procurement Centers

All estimates in the 8 tables of this appendix were derived from a statistical, random sample of 317 contracts awarded by the four centers during fiscal years 1985 through 1989.

Table I.1: Estimated Number of Contracts With Cost Increases

Center	Population of contracts	Contracts with cost increases	Percent of population	Lower confidence limit (percent)	Upper confidence limit (percent)
Goddard	688	189	28	16	39
Marshall	678	202	30	23	37
Kennedy	146	61	42	32	51
Johnson	313	139	45	30	59
Total	1,825	591	32	27	38

Table I.2: Estimated Number of Contracts With Time Delays

Center	Population of contracts	Contracts with time delays	Percent of population	Lower confidence limit (percent)	Upper confidence limit (percent)
Goddard	688	268	39	28	50
Marshall	678	256	38	28	47
Kennedy	146	50	34	24	44
Johnson	313	181	58	47	69
Total	1,825	755	41	36	47

Table I.3: Estimated Original Contract Values, Annual Cost Increases, and Rates

Center	Original value (in billions)	Annual cost increase (in millions)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Goddard	\$9.1	\$32	0.4	-0.2	0.9
Marshall	7.4	103	1.4	0.5	2.3
Kennedy	1.6	102	6.6	6.5	6.6
Johnson	0.7	20	2.7	-0.1	5.5
Total	\$18.8	\$257	1.4	0.4	2.4

**Appendix I
Selected Estimates of Time and Cost
Increases in Contracts Awarded by NASA's
Four Largest Procurement Centers**

Table I.4: Estimated Number of Contracts With Time Delays and Rates

Center	Contracts with time delays	Annual delay (in years)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Goddard	268	66	4.4	2.7	6.1
Marshall	256	125	15.9	10.0	21.7
Kennedy	50	11	6.0	3.0	9.1
Johnson	181	64	11.5	8.2	14.8
Total	755	266	8.8	6.8	10.8

Table I.5: Estimated Number of Contracts With Cost Increases and Rates, by Type of Contract

Contract type	Population of contracts	Percent of population	Original value (in billions)	Annual cost increase (in millions)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Fixed	1,075	59	\$0.6	\$21	3.6	1.8	5.5
Cost-reimbursable	745	41	18.1	218	1.2	0.3	2.1
Total	1,820^a		\$18.7	\$239			

^a Five hybrid contracts are not included in the total population of 1,820.

Table I.6: Estimated Number of Contracts With Time Delays and Rates, by Type of Contract

Contract type	Population	Annual delay (in years)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Fixed	1,075	155	12.6	8.7	16.5
Cost-reimbursable	745	110	6.2	4.3	8.0
Total	1,820^a	265			

^a Five hybrid contracts are not included in the total population of 1,820.

Table I.7: Estimated Number of Contracts With Cost Increases and Rates, by Type of Product

Type of product	Population of contracts	Percent of population	Original value (in billions)	Annual cost increase (in millions)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Research and development	871	48	\$9.4	\$42	0.5	-0.2	1.1
Service	508	28	1.7	82	4.7	3.0	6.5
Supplies and equipment	446	24	7.6	133	1.8	0.9	2.7
Total	1,825		\$18.7	\$257			

Appendix I
Selected Estimates of Time and Cost
Increases in Contracts Awarded by NASA's
Four Largest Procurement Centers

Table I.8: Estimated Number of Contracts With Time Delays and Rates, by Type of Product

Type of product	Population of contracts	Annual delay (in years)	Annual rate (percent)	Lower confidence limit (percent)	Upper confidence limit (percent)
Research and development	871	129	7.6	5.5	9.6
Service	508	61	7.2	5.1	9.4
Supplies and equipment	446	76	16.1	6.9	25.3
Total	1,825	266			

Comments from the National Aeronautics and Space Administration



National Aeronautics and
Space Administration

Washington, D.C.
20546

Office of the Administrator

SEP 4 1991

Mr. Frank C. Conahan
Assistant Comptroller General
National Security and
International Affairs Division
General Accounting Office
Washington, DC 20548

Dear Mr. Conahan:

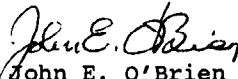
We have reviewed the GAO draft report, "NASA Procurement: Management Oversight of Contract Cost Increases and Time Extensions Could Be Enhanced."

In general, we agree with the observations cited. Based on your analysis of a statistical sample of contracts at four Centers, cost increases and schedule extensions experienced on NASA contracts were relatively moderate. It is recognized that the Financial and Contractual Status (FACS) system, as it is currently designed, is not able to provide comprehensive information on the extent of growth in these areas. While there is no indication in your report that significant problems were found in the management of contract costs and schedules, we agree that there could be some value in improving our capabilities for monitoring these areas.

We concur with your recommendation to examine the extent of changes necessary to enhance the FACS system to provide information on contract cost increases and time extensions and to implement such changes if it is cost effective to do so. Based on our initial discussions with the programmers responsible for maintaining FACS, it appears that the recommended changes could be accomplished without extensive modifications to the system.

We will continue to pursue this potential enhancement of the FACS system and, if cost effective, implement the change as soon as is practical.

Sincerely,


John E. O'Brien
Assistant Deputy Administrator

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