

Report to Congressional Requesters

August 1993

NASA AERONAUTICS

Protecting Sensitive Technology





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057820/149782RELEASED



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

National Security and International Affairs Division

B-252106

August 12, 1993

The Honorable John Conyers, Jr. Chairman, Committee on Government Operations House of Representatives

The Honorable Tim Valentine
Chairman
The Honorable Tom Lewis
Ranking Minority Member
Subcommittee on Technology, Environment, and Aviation
Committee on Science, Space, and Technology
House of Representatives

As requested, we reviewed the National Aeronautics and Space Administration's (NASA) efforts to control the transfer of agency-developed competitively sensitive aeronautics information to U.S. industry's foreign competitors. Pecifically, you asked us to (1) identify how NASA currently controls the disclosure of sensitive information, (2) determine whether NASA has an information control problem, and (3) ascertain what actions, if any, NASA planned to take to improve its information control program.

As part of our review, we also evaluated a management review of Ames Research Center and NASA's procedures for handling requests for competitively sensitive information under the Freedom of Information Act (FOIA) (5 U.S.C. 552).

Results in Brief

Most of NASA's scientific and technical aeronautics publications are publicly available. The distribution of a few publications is restricted, depending on the type of competitively sensitive information they contain, but NASA does not consider this information exempt from disclosure under FOIA.

To control the dissemination of competitively sensitive information, NASA sometimes strictly interprets a standard in FOIA requiring a reasonable description of an agency record under the act to deny requests for information. NASA also broadly construes the concept of national security under the Arms Export Control Act to cover competitive sensitivity and recommends amendment or denial of export license applications.

¹Senator Barbara M. Boxer, formerly Chair of the Subcommittee on Government Activities and Transportation, House Committee on Government Operations, was an original requester for this report.

Our review did not disclose sufficient information to support the view that NASA's competitively sensitive information is being widely transferred to U.S. industry's foreign competitors.

An August 1992 management review team's report on Ames Research Center concluded that (1) the nature of Ames' work makes it a high risk for hostile intelligence operations, (2) Ames did not focus appropriate management attention on the handling of sensitive technology, (3) Ames' organizational culture² is the underlying cause of this vulnerability, (4) Ames' credibility with the U.S. aerospace industry has been damaged as a result, and (5) NASA's customers and partners are reluctant to share important data with Ames because they are afraid that it will be inappropriately disseminated. However, our review indicated that the Ames management review report lacked sufficient evidence to support such conclusions and its conclusions were based on limited investigation.

Competitively sensitive information generally was not the subject of foia requests. However, if the Congress enacts the executive branch's proposal to increase spending on commercially relevant advanced subsonic technology in fiscal year 1994, foia requests for NASA's competitively sensitive information are likely to increase.

NASA has initiated two actions to improve its information control program. It is completing action on the recommendation made by the Ames management review team to develop and implement specific processes for identifying and handling competitively sensitive information. It has also initiated a process to establish an overall NASA aeronautics technology transfer policy that will address the identification and handling as well as the measurement and tracking of competitively sensitive technologies.

Background

NASA is the focal point for the federal government's support of aeronautics technology. The National Aeronautics and Space Act of 1958 (42 U.S.C. 2451 et seq.) charges NASA with preserving the role of the United States as a leader in aeronautical science and technology. To this end, the executive branch is proposing to increase fiscal year 1994 spending on NASA's aeronautics research and technology from \$865.6 million in fiscal

²The review team did not define organizational "culture" in its report. Our report, <u>Organizational</u> Culture: Techniques Companies Use to Perpetuate or Change Beliefs and Values (GAO/NSIAD-92-105, Feb. 27, 1992), defined this concept as the "underlying assumptions, beliefs, values, attitudes, and expectations shared by an organization's members."

³NASA conducts aeronautics research at Ames, Langley, and Lewis research centers in California, Virginia, and Ohio, respectively.

year 1993 to about \$1 billion for fiscal year 1994. This represents about 6.7 percent of NASA's \$15.3-billion proposed total budget.

NASA believes that, as a leader in the development of key aerospace and electronics technologies, it is vulnerable to economic espionage. This belief, coupled with a change in global economic competition, has caused NASA to reexamine its traditional desire to share technical information internationally. This reexamination is especially timely because the executive branch's policy is to expand and focus NASA's research efforts, in part, on technologies that would increase the competitiveness of U.S. commercial transport aircraft and enhance the safety and productivity of the national aviation system. The NASA budget proposal for fiscal year 1994 reflects this focus principally in the proposed increase in spending for systems technology programs from \$280.3 million in fiscal year 1993 to about \$429 million. One part of this program—advanced subsonic technology—would increase from \$12 million in fiscal year 1993 to over \$100 million. The need to ensure the commercial applicability of this technology is a stated objective of the program.

Although the NASA act charges the agency to provide the "widest practicable and appropriate dissemination of information," the agency has traditionally recognized the need to control the results of research and development that have, in the agency's words, "significant potential for domestic benefit." NASA defines such research results as technical data for

- "early domestic dissemination" that are applicable to commercial products that will reach the market sooner or will be superior to that of foreign competition or
- "limited distribution" that relate to a "proof-of-concept or a major breakthrough" that could be used in a commercial or governmental aerospace system or subsystem within 5 years.⁵

The transfer of NASA's competitively sensitive information to U.S. industry's foreign competitors is possible under FOIA. The act requires federal agencies to promptly make available to "any person," including foreigners, "agency records," other than those covered by nine

⁴Office of Management and Budget, A Vision of Change for America (Feb. 17, 1993).

⁵According to NASA, documents containing technical data in these categories are restricted to selected domestic subscribers of these documents for generally 2 years before dissemination to the public.

exemptions, upon receipt of a written request that reasonably describes such records.⁶

The United States controls, in part, the export of aeronautics-related products and technical data through an export licensing system. For aeronautical products and technical data having both commercial and military significance, the Department of Commerce issues export licenses under the authority of the Export Administration Act of 1979, as amended (50 U.S.C. 2401 et seq.). However, according to a NASA official, the Department of Commerce does not routinely request NASA recommendations on the export licensing decisions it makes. For products and technical data having direct military application ("arms, ammunition, and implements of war"), the Department of State issues export licenses under the authority of the Arms Export Control Act, as amended (22 U.S.C. 2778 et seq.). NASA reviews export license applications and makes recommendations to the State Department on licensing decisions related to the Arms Export Control Act.

How NASA Controls Competitively Sensitive Information

NASA is able to control the distribution of competitively sensitive information, in part, by interpreting various provisions of FOIA and the Arms Export Control Act to the advantage of its information control policy. The agency has also established institutional obstacles that can make the identification of technical and scientific information that has potential commercial value more difficult.

Freedom of Information Act

NASA, at the urging of industry, has attempted to protect competitively sensitive information from disclosure under fold by determining certain information to be statutorily exempt from disclosure. For nonexempt information, it has strictly interpreted (1) the meaning of the phrase to "reasonably describe" an agency record and (2) what constitutes a fold request.

Exempting Limited Exclusive Rights Data From Disclosure Under FOIA NASA attempts to protect data associated with its High Speed Research program by including a limited exclusive rights data clause in program-related contracts. Limited exclusive rights are a deviation from

⁶Exemptions include agency records that are (1) classified for national security purposes, (2) designated trade secrets and confidential commercial or financial information, and (3) specifically exempted from disclosure by another statute.

⁷The purpose of the High Speed Research program is to develop technologies for an environmentally safe, affordable high speed civil transport aircraft. NASA has made this program its top priority aeronautics research effort.

the Federal Acquisition Regulation that defines rights in data.⁸ Under the regulation, both the government and contractors have "unlimited rights" to use, duplicate, and disclose publicly financed data. To the extent that unlimited rights data are a part of nonexempt "agency records" within the meaning of FOIA, they are subject to disclosure.

The limited exclusive rights agreements are intended to give ownership of the data to the contractors and require that they furnish NASA and other participating contractors in the High Speed Research program with such data on a royalty free basis. Because NASA and contractors treat such data as trade secrets under this arrangement, it is presumed to be protected from disclosure by NASA under FOIA. The act exempts from disclosure "trade secrets and commercial or financial information obtained from a person [that is] privileged or confidential." The propriety of using the trade secrets exemption to withhold limited exclusive rights data that NASA pays for has not been the subject of judicial review.

According to NASA officials, a "successful" denial of a FOIA request for such data under the trade secret exemption depends on whether (1) such data belongs to the contractor and (2) such denial is consistent with trade secret protection afforded by state law. According to these officials, NASA funding does not affect contractor ownership of the data; only the terms of the contract do. These officials also reason that for data to be afforded trade secret protection, it should meet three fundamental requirements: limited availability, economic value, and relative secrecy. Although NASA officials believe limited exclusive rights data meet these requirements, they noted that "relative secrecy" is the "major hurdle facing a characterization of [limited exclusive rights data] as a trade secret" if large numbers of NASA and contractor personnel have access to such data.

Strictly Interpreting the Applicability of a FOIA Clause

A clause in Foia requires that a requester "reasonably describe" the desired agency record. Nasa has denied requests for information on the grounds that the requester did not meet this standard. In 1992, for example, Nasa received 3,644 requests for records and the agency initially denied 1,442; 777 denials were based on one of Foia's exemptions, and 665 denials on "other authority." Of those denials related to "other authority," 207 were denied for reasons that, depending on the specific wording of the request, might have been associated with the reasonable description standard.⁹

⁸⁴⁸ C.F.R. 52.227-14, "Rights in Data-General."

⁹That is, (1) the requester either made a blanket or categorical request or did not adequately describe the desired record or (2) NASA stated that it did not possess the requested record or that the information did not exist.

In July 1992, for example, a requester asked for NASA's "Research and Technology Objectives and Plans" in "propulsion systems design and development." These are program management documents that include (1) a brief technical summary, (2) a detailed statement of each program part's objectives and approaches, and (3) budget information for 5 years. At the time of the request, NASA had five statements of objective and plans associated with propulsion, but none of them were specifically entitled, "propulsion systems design and development."

In replying to this request, NASA might have narrowly interpreted the phrase, "propulsion systems design and development," and thus denied the request, or broadly interpreted this phrase and given the requester some or all of the propulsion-related statements. NASA denied the request on the grounds that there were no statements of objectives and plans "responsive to your request." The requester appealed the decision and NASA again denied his request.

NASA officials told us that there was some concern that an affirmative response to this request could have led to more precisely written requests for competitively sensitive information about the High Speed Research program. As discussed previously, NASA officials believe that, in the absence of a judicial decision to the contrary, technical information associated with this program, and subject to limited exclusive rights, is exempt from disclosure under FOIA. They believe this request might have provided a basis for judicial review of the act's assumed relationship to limited exclusive rights data.

Strictly Interpreting What Constitutes a FOIA Request

NASA has also narrowly defined what constitutes a FOIA request to protect information about the High Speed Research program. In 1991, it denied without explanation a request from a foreign aerospace firm for a specific report of a meeting associated with this program. The requester did not refer to FOIA in his letter, and NASA, therefore, did not treat it as a FOIA request. A NASA official told us that the requested document probably could not have been excluded under the act, but, as in the previous example, there was concern that the release of such information could have prompted official FOIA requests about the high speed program.

Arms Export Control Act

The Arms Export Control Act states that license applications to export items on the U.S. Munitions List, including technical data on developmental aircraft and military aircraft, can be denied by the President if determined to be in the "furtherance of world peace and the

security and foreign policy of the United States." The President's authority under the act has been delegated to the Secretary of State. For some proposed exports, NASA provides recommendations to the Department of State on whether to approve, amend, or deny license applications. However, neither the act nor its implementing regulations specify competitive sensitivity as a basis for denying a license application. NASA has attempted to restrict the export of aerospace technology by establishing a relationship between competitive sensitivity and U.S. national security or foreign policy. NASA asserted this relationship in a number of licensing recommendations that it made in 1992.

We reviewed 15 proposals or applications to export aeronautics-related data and computer codes, often as part of technical assistance agreements between U.S. and foreign firms. NASA raised questions about the competitive sensitivity of the proposed export in its review of four applications (27 percent). In one case, NASA recommended denial of a technical assistance agreement, noting that

approval of the subject request would enhance the ability of other nations to develop aerospace planes and hypersonic cruise vehicles and thus could compromise the long-term economic competitiveness and security of the U.S. Moreover, approval of the proposed [technical assistance agreement] could result in increased foreign competition for the U.S. space launch industry.

The Department of State denied the firm's request to enter into a technical assistance agreement.

Institutional Barriers to Release of Information With Potential Commercial Value

NASA's scientific and technical publications are reviewed for content that has potential commercial value. Publications that have such content are designated "limited distribution" or "for early domestic dissemination." Abstracts of such documents are electronically stored and access is controlled by registration status and authorized passwords. ¹⁰ Registration determines the type of documents one is authorized to receive, and a password permits one to scan the appropriate data base and obtain specific abstracts. Abstracts are not supposed to contain competitively sensitive information. The actual physical release of documents is managed by NASA headquarters' scientific and technical information office.

 $^{^{10}}$ The scientific and technical information data base is operated by the Center for Aerospace Information in Baltimore, Maryland.

As noted previously, publications so designated are not considered by NASA to be exempt from disclosure under Foia. The value of the designation as it relates to Foia is directly related to how difficult NASA can make it for parties to search for titles of documents containing commercially valuable information. Without such titles, a requester may not be able to "reasonably describe" the desired document to NASA's satisfaction. We believe that NASA's procedures make it difficult for requesters to identify documents that are designated according to the potential commercial value of the information they contain.

Few Requests for Competitively Sensitive Information Under FOIA

Under FOIA, any person, including foreigners, can request competitively sensitive information (that is, information designated "limited distribution" or "for early domestic distribution") that NASA develops. NASA does not consider this information to be statutorily exempt from disclosure under the act.

However, we did not find any requests for documents designated by NASA as competitively sensitive among the 1991 and 1992 fola requests we reviewed at NASA headquarters, as well as the Ames and Lewis research centers. NASA officials responsible for handling fola requests at these three locations confirmed that requests for agency records designated in terms of their competitive sensitivity are rare.

A reason we did not find such requests may be because NASA designates relatively few documents as having competitive sensitivity. According to NASA, only 6 of 2,255 documents that the Ames Research Center published in 1991 and 1992 contained competitively sensitive information. Similarly, only 30 (11 related to aeronautics) of 2,504 documents published by the Lewis Research Center were considered competitively sensitive.

Management Review Team's Report Flawed

In July 1992, NASA's Administrator called for a management review of Ames Research Center in Mountain View, California, because of concerns by security personnel that some researchers may have transferred competitively sensitive information abroad. We found that the broad policy and management conclusions in this report were based on a narrowly focused investigation. The management review team did not compare the information identification and handling activities at Ames to the existing standards, the scope of the review was limited, and some of the conclusions were not supported by empirical evidence.

Inappropriate Comparison

The review team criticized Ames on two policy matters:

- a "noticeable lack of sensitivity for policies and practices more responsive to the protection of U.S. technologies" and
- "no involvement of customers in identification of, in developing handling plans for, or in evaluating transition effectiveness of commercially valuable/sensitive technologies."

However, while the report acknowledged that "general policies exist for handling commercially valuable/sensitive technologies," the team did not assess whether Ames had acted in accordance with existing policy and procedures. ¹¹ In the report, Ames was measured against a yet-to-be-devised NASA policy. The review team, in essence, recognized this when it recommended that NASA "develop [with industry] and implement specific processes for the identification and handling of commercially valuable/sensitive technologies. . . ."

Review team members told us that prior to their review, NASA headquarters had not formally directed its research centers, in consultation with industry, to redefine and identify competitively sensitive technology and establish new controls on disseminating such information.

Scope Too Limited to Support Conclusions

The review team's report drew a number of broad conclusions about Ames as a whole, although the scope of its review was limited. While the team's review scope may have been sufficient for a security review, it was too limited for a management review, since the team investigated employees' activities in only one of six directorates and two of five divisions within the one selected directorate. In one of the divisions, the team investigated activities in all five branches, and in the other division only one of five branches. In the selected directorate, there were 20 branches at the time of the review. Not all of Ames' directorates, divisions, and branches conduct or support aeronautical research that may be competitively sensitive, but the apparent restricted scope of the review was not acknowledged or discussed in the report.

Review team members told us that they focused their concerns on specific organizations because of security issues that were developed by Ames officials prior to the formation of the management review team.

¹¹In this case, the question is whether publicly available information should have been classified "limited distribution" or "for early domestic dissemination" in accordance with NASA Management Instruction 2220.5D and NASA Handbook 2200.2.

In response to concerns by Ames employees, NASA chartered an assessment panel on August 26, 1992, to review the actual approach (i.e., how the team gathered information) of the management review team. The panel concluded in November 1992 that while the scope and objective of the management review were legal, the approach used should not be employed again in NASA because it was perceived by many employees as including duress, interrogation, distrust, heavy-handedness, and infringement of personal rights.

Insufficient Evidence of Institutional Weaknesses

The review team alleged that some of Ames' security and procurement procedures were ignored by several researchers. Allegations of wrongdoing involving 14 individuals or organizations were referred to the Inspector General, and as of April 30, 1993, his office had completed investigations that found 7 employees had (1) used NASA computer equipment for unofficial or personal purposes, (2) shared computer passwords, (3) procured a computer system without proper authorization, or (4) made investments that gave at least the appearance of a conflict of interest. The NASA Inspector General's investigations, however, did not identify any cases where these infractions involved the transfer of competitively sensitive information to U.S. industry's competitors. Three of these cases were presented by the Inspector General to the U.S Attorney's office for possible federal prosecution, but the office declined to prosecute.

The review team sought to explain these security and procurement lapses in terms of Ames' organizational "culture" that was described as "strongly biased toward maintaining an academic reputation rather than meeting U.S. industry and national needs." However, the team did not demonstrate that it had, in fact, determined Ames' culture and then linked it to employees' behavior. The team failed to support its assertion about the importance of culture and environment as an "underlying cause of NASA's vulnerability." There was also no discussion in the review team's report why employees, for example, shared their computer passwords. In short, the team did not discuss why an explanation of individual wrongdoing based on the specific circumstances of the person involved was less compelling than an explanation based on organizational culture.

The team also drew conclusions about Ames' relationship with the U.S. aeronautics industry that were not supported by systematically gathered evidence. For example, the review team concluded that Ames'

¹²No evidence of wrongdoing was found in two other cases.

credibility with the U.S. aerospace industry has been damaged as a result of [security-related] problems. Some of NASA's customers and partners are reluctant to share important data with NASA for fear it will be disseminated with little or no regard for its sensitivity.

Review team members told us that they did not obtain industry's views on data sharing with Ames as part of the management review. They said, however, that employees of some aerospace firms had from time to time expressed concern about the protection of competitively sensitive information at Ames. As a result of the review team's report, Ames officials said they informally surveyed these aerospace firms and none of the firms confirmed the review team's assertions on this point. We did not validate Ames' informal survey results.

NASA Actions to Improve Its Information Control Program

According to NASA officials, they are currently working on two initiatives designed to improve the agency's information control program. The first initiative is to complete action on the recommendations made by the Ames management review team, including one pertaining to developing and implementing specific processes for identifying and handling competitively sensitive information. At Ames, technology will be designated competitively sensitive when it meets one or more of the following six criteria: (1) the United States has a clear lead over its foreign competitors, (2) the technology is immediately applicable in the design of aerospace vehicles, (3) it was recently developed as a "breakthrough" that offers a competitive or strategic advantage, (4) it is important to a "major focused program," (5) it is targeted for acquisition by foreign research and industrial organizations, and (6) it was developed for NASA applications that could have significant long-term commercial applications. Ames will change its current information handling procedures once it has completed the identification process. NASA officials expect to complete work on the Ames management review team recommendations by July 31, 1993.

In a broader action, NASA has initiated, partly in response to findings contained in our recent report on technology transfer, ¹³ a process to develop an aeronautics policy that will address identifying, handling, measuring, and tracking competitively sensitive technologies. The Associate Administrator for Aeronautics has established a team to accomplish this. Initial team discussions have focused on the need to have industry involved in identifying competitively sensitive technologies,

¹³NASA Aeronautics: Impact of Technology Transfer Activities Is Uncertain (GAO/NSIAD-93-137, Mar. 16, 1993).

developing procedures for handling such technologies, and establishing the most effective methods for transferring these technologies to industry. NASA expects to have a new policy in place by the beginning of fiscal year 1994.

Emerging Issues

The executive branch's proposal to significantly increase funding for aeronautics research is expected to improve the competitiveness of U.S. commercial transport aircraft and aviation safety.

Assuming that the Congress approves these increases and NASA implements its plan to redefine and identify competitively sensitive technologies, NASA will likely have substantially more information that it considers competitively sensitive. Foreign entities may try to use FOIA requests as a vehicle for obtaining such information, because FOIA requires federal agencies, such as NASA, to promptly make available to any person, including foreigners, agency records upon request. If all of the above situations materialize, the existing nine exemptions to FOIA may be insufficient to prevent the undesirable transfer of technology to foreign competitors.

Agency Comments

NASA generally concurred with the treatment of the issues discussed in this report. As the Congress and the executive branch develop new guidelines for protecting competitively sensitive technology, NASA indicated it planned to improve and implement processes to control that information as soon as possible. Agency comments appear in appendix I.

Scope and Methodology

To accomplish our objectives, we interviewed and obtained documents from officials at NASA headquarters in Washington, D.C., and at the Ames and Lewis research centers in Mountain View, California, and Cleveland, Ohio, respectively. We assessed the management review team's report and reviewed requests under FOIA. We did not evaluate whether NASA had appropriately designated its technical and scientific documents to preclude improper dissemination.

We obtained information concerning the management review of Ames from (1) documents provided by the management review team and management and security officials at Ames and (2) completed investigations by NASA'S Office of Inspector General.

With respect to Foia requests, we reviewed all five aeronautics-related requests that were handled by NASA headquarters. At Ames and Lewis, we reviewed the 1991 and 1992 logs of requests (930 entries) and examined 67 requests in greater detail. Forty-seven of these requests were systematically selected from the centers' records, and 20 were selected because they referred to technical documents or other information that NASA might have designated as competitively sensitive.

We reviewed all aeronautics-related export license applications that NASA reviewed from January through November 1992.

We performed our work from October 1992 through May 1993 in accordance with generally accepted government auditing standards.

As agreed with your staff, unless you publicly announce its contents earlier, we plan no further distribution of this report until 3 days after its issue date. At that time, we will send copies to the NASA Administrator and other appropriate congressional committees. Copies will also be made available to other interested parties on request.

Please contact me on (202) 512-4587 if you or your staff have any questions concerning this report. The major contributors to this report are George A. Jahnigen, Assistant Director; Thomas E. Mills, Evaluator-in-Charge; and Shirley B. Johnson and Penny A. Berrier, Evaluators.

Paul F. Math

Director, Acquisition Policy,

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Technology, and Competitiveness Issues

Comments From the National Aeronautics and Space Administration

Note: GAO comments supplementing those in the report text appear at the end of this appendix.

National Aeronautics and Space Administration

Office of the Administrator Washington, DC 20546-0001



June 28, 1993

Mr. Frank C. Conahan Assistant Comptroller General General Accounting Office Washington, DC 20548

Dear Mr. Conahan:

Thank you for the opportunity to review and comment on your draft report entitled "NASA Aeronautics, Protecting Sensitive Technology: Scope of Problem is Uncertain," GAO Code 397067.

In addition, we appreciate the GAO's support of the notion that identifying and handling competitively sensitive technologies are increasingly important processes for NASA's Aeronautics program. The recognition and support of our efforts to establish an Aeronautics technology transfer policy is valuable to us.

NASA is not uncertain about its responsibility to protect sensitive technology. Within the regulations and guidelines available to us, we have applied good and fair practices to meet that responsibility. We especially appreciate the GAO's recognition that NASA requires additional legislation in order to protect competitively sensitive technology from disclosure under the Freedom of Information Act. As the goals, policies and legislation of this Administration and Congress cultivate new guidelines for protecting sensitive technology, we will improve and implement processes to control that information, as soon as possible.

With regard to the content of the draft report, our review has surfaced a number of editorial comments and suggested corrections. These will be forwarded to your staff under separate cover. There are several changes that should be made to the report in order to make its contents factually accurate. I would also appreciate the opportunity for our staffs to meet and discuss these comments in more depth.

Sincerely,

J. R Dailey
Associate Deputy Administrator

See comment 1.

See comment 2.

See comment 3.

- Ledit Section

Appendix I
Comments From the National Aeronautics
and Space Administration

The following are GAO's comments on the National Aeronautics and Space Administration's (NASA) letter dated June 28, 1993.

GAO Comments

- 1. Our report deals with the uncertainty of the scope of the problem and did not imply that NASA is uncertain about its responsibilities to protect sensitive technology.
- 2. We have not recommended additional legislation at this time, but we recognize that the exemptions in the Freedom of Information Act may not be adequate to prevent the transfer of competitively sensitive information if NASA substantially redirects its aeronautics program.
- 3. We have modified this report where appropriate based on NASA officials' informal comments.

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