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02. Memo	From Karl Erb to D. Allan Bromley Re: Advanced Reactor R&D Issues (3 pp.)	6/3/91	(b)(1)	

Collection:

Record Group: Bush Presidential Records
Office: Chief of Staff to the President, Office of the
Series: Sununu, John, Files
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(Bromley) (1991) [4]

Date Closed:	12/29/2004	OA/ID Number:	29184-004
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AR Disposition:		MR Disposition:	
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P-3 Release would violate a Federal statute [(a)(3) of the PRA]
P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
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(b)(9) Release would disclose geological or geophysical information

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The Secretary of Energy
Washington, DC 20585

May 21, 1991

→ also sent to
Walker, Lloyd, Morrison

The Honorable George E. Brown, Jr.
Chairman
Committee on Science, Space,
and Technology
U.S. House of Representatives
Washington, DC 20515

Dear Mr. Chairman:

I understand that the Committee on Science, Space, and Technology soon will mark up the "Energy Technology Research and Development Authorization Act of 1991," which was approved by the Subcommittee on Energy on April 25, 1991.

The Subcommittee's proposed legislation substantially revises the Department of Energy's (DOE) request for Nuclear Energy programs for FY 1992. DOE strongly opposes the changes made by the Subcommittee and requests that the full Committee restore the budget to that proposed by the Administration. Our specific comments are contained in the paragraphs below and in the enclosures to this letter.

DOE's highest priority Nuclear Energy program is the Advanced Light Water Reactor, including our efforts to support design certification and our new initiative to co-fund first-of-a-kind engineering for certified designs, starting in FY 1992. The Subcommittee's proposed funding cut and authorizing language would prevent the achievement of a principal objective of the National Energy Strategy--to secure a first order for a new nuclear powerplant by 1995 to help meet urgent needs for added baseload electrical generating capacity. The Subcommittee's action would also unduly and inappropriately restrict competition.

DOE has been assigned a major role by the President in support of the Space Exploration Initiative (SEI). The funding level authorized by the Subcommittee would severely limit this role and would not permit needed scoping of nuclear propulsion technologies, which are enabling to many of the possible SEI missions. In addition, our ability to proceed with the SP-100 space reactor in support of a wide range of future National Aeronautics and Space Administration, Strategic Defense Initiative, and SEI space missions will be significantly and adversely affected.

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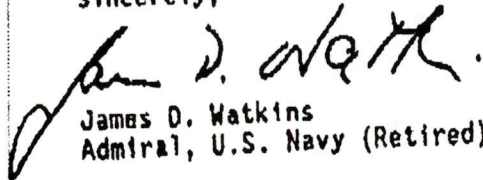
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The proposed reduction in Program Direction would prevent implementation of one of my principal initiatives to change the culture and effectiveness of DOE--to improve line management of DOE activities.

It is neither cost effective nor necessary to authorize more than the DOE request for \$6 million of FY 1992 funding for the commercial High Temperature Gas Reactor (HTGR) based on the status of that technology's development and the benefits of common work with the New Production Reactor HTGR.

I have enclosed further comments regarding DOE's position on the Subcommittee's proposed legislation. I strongly request that the Committee carefully consider these comments before markup.

Sincerely,


James D. Watkins
Admiral, U.S. Navy (Retired)

8 Enclosures

7

Address ListAddressee

1. The Honorable George E. Brown, Jr.
Chairman
Committee on Science, Space,
and Technology
and Technology
U.S. House of Representatives
Washington, DC 20515
2. The Honorable Robert S. Walker
Ranking Minority Member
Committee on Science, Space,
and Technology
and Technology
U.S. House of Representatives
Washington, DC 20515
3. The Honorable Marilyn Lloyd
Chairman
Subcommittee on Energy
Committee on Science, Space,
and Technology
U.S. House of Representatives
Washington, DC 20515
4. The Honorable Sid Morrison
Ranking Minority Member
Subcommittee on Energy
Committee on Science, Space,
and Technology
U.S. House of Representatives
Washington, DC 20515

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Advanced Light Water Reactor (ALWR) First-of-a-Kind Engineering Program

DOE's budget for ALWR first-of-a-kind engineering would be decimated--reduced from \$20M to \$2M--and the program would be restricted to only one vendor who already has an order for construction of a nuclear powerplant and already has a design certified by the Nuclear Regulatory Commission (NRC). We are working with OMB and NRC to achieve satisfactory completion of schedules for design certification during FY 1991.

On a cost sharing basis with industry, the first-of-a-kind engineering program will complete the design of ALWR powerplants beyond that required for NRC safety certification to the point that costs and construction schedules can be well defined and a commercially standard design is available to be built for the first time. This is the highest priority new nuclear initiative of DOE and responds to the FY 1991 Energy and Water Development Appropriation Report, which stated: "The Committee urges the Department to evaluate the need for Federal funding of first-time engineering and to make a recommendation as part of its FY 1992 budget request."

The nuclear industry strongly supports this program. The prospect for government funding has already led the electric utility industry to secure potential commitments of tens of millions of dollars for cost sharing, which will be lost without DOE support. No utility will commit to the construction of a first new nuclear powerplant until front end financial risks and uncertainties are sufficiently reduced.

The authorizing Subcommittee's language creates an impossible or "Catch-22" situation. An order will not be realized until there is a completed design, which cannot be co-funded by the government without an order. Further, the Subcommittee's approach would prevent funds from being applied to complete a first-time 600 MWe passive plant design, which has very strong support from the utilities.

The Subcommittee's action is anti-competitive because designs that will be certified in 1995 cannot be considered in a solicitation. The restrictions of only considering designs that have already been certified by the NRC should be removed. The DOE approach of letting the market--electric utility companies--determine the designs that should be supported is far preferable. In addition, it is likely that our trading partners would question whether the 75 percent domestic content requirement are consistent with United States obligations under the General Agreement on Tariffs and Trade.

Without the first-of-a-kind engineering program, one of the major objectives of the National Energy Strategy--to secure a new nuclear powerplant order by 1995 and initial plant operation by the year 2000--will not be achieved and the electric utility industry's Strategic Plan for Building New Nuclear Powerplants will not proceed. The full \$20M should be authorized as requested. We understand that Congressman Morrison intends to introduce an amendment to correct the unduly restrictive language in the Energy Subcommittee markup. We would support that amendment.

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SP-100 and Space Exploration Initiative

The elimination of over 80 percent of the Space Exploration Initiative (SEI) funding by the authorizing Subcommittee will severely limit DOE's capability to support NASA in this area. In particular, the reduction will all but eliminate our capability to initiate the development of nuclear propulsion, which will be essential for any future effort at manned space exploration. DOE's ability to utilize technologies under development for other programs and apply them in support of space exploration will also be curtailed, thereby losing the opportunity to enhance U.S. technological competitiveness and to assist in the revitalization of the U.S. educational system. The proposed restoration in the Brown amendment of 40 percent of the reduction made by the Subcommittee is a step in the right direction, but full restoration would be even more appropriate and enable the full range of necessary SEI support activities to be conducted.

In addition to these cuts in the overall SEI effort of DOE, the Subcommittee's action will adversely impact our ability to provide the space reactor power sources needed for a wide range of future space missions. The SP-100 program is developing nuclear reactor power systems that require higher power levels than currently available from DOE's radioisotope thermoelectric generators. The need for the SP-100 program has been endorsed by NASA, the SDIO, and the Air Force Scientific Advisory Board. Space reactor power systems are considered by nearly all experts to be the only practical way to supply the power required for full exploration of the Moon or Mars. Funding reductions in prior years have delayed the program and substantially increased its costs. The restoration of one-half of the Subcommittee's reduction, as proposed by the Brown Amendment, will reduce but not eliminate future program delays and cost increases. Full restoration would eliminate those impacts in their entirety.

Taken together, the Subcommittee's reductions will cripple DOE's efforts to develop power reactors for future space programs, will prevent DOE from fulfilling the role assigned by the President as a major developer of technology for the SEI, and will deny to the Nation space nuclear propulsion technology, which is essential for future planetary exploration. Any restoration of these cuts, either by the Brown Amendment or other vehicle, should be adopted.

Commercial High Temperature Gas Reactor

In the FY 1992 Congressional budget submittal, DOE requested \$34M for the Advanced Liquid Metal Reactor (ALMR)/Integral Fast Reactor (IFR), \$4M for Light Water Reactor (LWR) Actinide recycle and \$6M for the commercial High Temperature Gas Reactor (HTGR).

The authorizing Subcommittee would delete \$6M of the \$9M proposed by DOE for ALMR design and substitute control system research and robotics development. The subcommittee also added \$10.5M to DOE's request for the HTGR. Considered alone, DOE's proposed allocation of funds could erroneously be considered to slight development of the HTGR concept and to overly favor development of the ALMR/IFR concept. Such is not the case.

The funding level of \$34M for the ALMR/IFR and \$4M for LWR actinide recycle studies is the minimum required to support timely progress on that program. The National Academy of Sciences is initiating a study that would specifically evaluate the claims made by the proponents of actinide recycle in ALMRs. The objective will establish, by 1995, the technical and economic feasibility of that system for possibly contributing to the long-term waste management solution for all reactor types deployed in the U.S. as well as extending uranium resources.

The \$6M for the HTGR is part of a larger total that would be spent on that concept in FY 1992. This augments a significant amount of common design and development work funded for the New Production Reactor-HTGR but fully applicable to a commercial HTGR.

The \$6M funding level for the commercial HTGR is appropriate because the design developed for that concept in past years was found not to be economic. It requires further redefinition and licensing evaluation before additional funding should be applied. It would be neither cost effective nor prudent to authorize more than the \$6M requested. Contractors responsible for the HTGR design have testified that they desire more FY 1992 funding. DOE considers that they should pay for any further redesign of their uneconomic concept in FY 1992 themselves.

The Subcommittee's action would emasculate the ALMR design program while putting money into much lower priority controls and robotics activities that are not considered necessary in a tight budget climate. The \$10.5M added for the HTGR could not be spent effectively by DOE. The DOE budget should be supported.

Advanced Controls Research and Robotics Development

Within the Advanced Reactor Research and Development program, the highest priority is on establishing the technical and economic viability and licensability of the Advanced Liquid Metal Reactor/Integral Fast Reactor (ALMR/IFR) system, and an evaluation of the technical feasibility of light water reactor spent fuel actinide extraction. ←

Because of budget constraints, funding for the advanced controls program is not recommended. With respect to the robotics program, these activities do not support any identified programmatic need in the Advanced Reactor Research and Development program and should not be funded under this program. It should also be noted that the Office of Nuclear Energy has, without success, conducted discussions with other Federal groups to determine their interest in utilizing the work accomplished in the program to date as a base from which to complete their defined needs.

Funding should not be authorized for Advanced Controls Research and Robotics Development rather than higher priority Advanced Liquid Metal Reactor design and development.

Civilian Radioactive Waste Research and Development (RAD)

Regarding the markup on waste management mitigation, existing actions in DOE are already addressing issues of concern to the authorizing Subcommittee:

- o DOE appreciates the Subcommittee's favorable comments regarding the projects, cost shared with industry, to study spent nuclear fuel consolidation and dry cask storage.
- o The recently issued National Energy Strategy recognizes the importance of having in place by 2010 a licensed facility capable of providing permanent disposal of commercial spent fuel. At least one geologic repository for permanent disposal will be required regardless of progress on waste minimization research and development. The need for a second geologic repository is to be addressed in the 2007-2010 time period;
- o The DOE Offices of Nuclear Energy, Environmental Restoration and Waste Management, and Civilian Radioactive Waste Management, recognizing the need for the closest coordination regarding management-of-waste issues, have established a cooperative effort to discuss, coordinate, and resolve program issues to address relevant waste management R&D problems;

o DOE uses experts from the laboratories and industry to provide advice regarding these issues. In particular, DOE is in the process of initiating a detailed review by the National Academy of Sciences of various programs addressing the management of waste.

While we fully agree with the intent of the Subcommittee's recommendation that DOE address development issues that enhance the management of nuclear waste, we do not consider that additional FY 1992 funding is required. Also, it is not possible to provide a report in 90 days that would advance our understanding sufficiently to justify spending an additional \$7.3 million on these activities. The coordinated effort that DOE has initiated to address nuclear waste mitigation issues, including concerns expressed by the Subcommittee, should be continued and completed. We recommend that DOE provide a report to Congress in conjunction with the FY 1993 budget with appropriate recommendations for conducting further research and development on nuclear waste mitigation.

Nuclear Engineering Education Program

DOE requested \$2.5 million in the Office of Nuclear Energy (NE) FY 1992 budget to inaugurate a "Nuclear Engineering Education Program." The goal of the program is to provide assistance to university nuclear engineering departments and students in support of DOE/NE advanced reactor development efforts and Department-wide science education goals. The funding would be used for grants to university nuclear engineering departments for new equipment, upgrading courses and laboratories, curriculum improvements, and other related purposes; and for fellowships and scholarships to nuclear engineering students. It is expected that the money will help solve some of the serious problems delineated in the 1990 NAS/National Research Council report, "U.S. Nuclear Engineering Education: Status and Prospects."

In the Subcommittee report, the NE funding request has been confused with the "Nuclear Engineering Research Program" administered by the Office of Energy Research (ER). The ER program consists of research grants awarded to individual faculty members to carry out specific research projects. Thus, it is different in both nature and intent from the new program proposed by NE. DOE therefore requests that the \$2.5 million funding be restored to and kept within the NE budget.

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Program Direction

One of Admiral Watkins' top priorities is to improve line management accountability and instill a new corporate culture in the DOE work place. As part of this initiative, the technical capabilities of line management personnel who oversee nuclear programs are being strengthened to ensure adequate protection of DOE workers and the public from nuclear hazards.

In furtherance of the new operating philosophy that line organizations are fully responsible for their own activities, all line management manpower resources necessary to fulfill specific program objectives are to be budgeted by the cognizant program organization. The FY 1992 Nuclear Energy research and development program direction budget, therefore, includes operations office line management personnel that historically have been budgeted in the Departmental Administration account.

The proposed reduction of \$5.9 million would require a reduction of about 70 positions, both at Headquarters and various operations offices, involved in the line management of Nuclear Energy research and development programs. The Administration's budget should be authorized.

10

Atomic Vapor Laser Isotope Separation (AVLIS)

The Administration, based upon policy considerations, has concluded that investments in the AVLIS technology should more appropriately be made by the private sector. Therefore, the FY 1992 budget did not include funding for AVLIS predeployment activities. We consider that the creation of a Government corporation for uranium enrichment, as an interim step to eventual privatization, to represent the best means to ensure investment in, and deployment of, the AVLIS technology.

The DOE funding request of \$213.6 million for AVLIS for FY 1992 is consistent with completing the demonstration of the technology so that a Government corporation could make the appropriate decisions associated with this program.

11

CRITICAL TECHNOLOGIES INSTITUTE

THE WHITE HOUSE

WASHINGTON

June 27, 1991

MEMORANDUM FOR JOHN H. SUNUNU

FROM: D. ALLAN BROMLEY *Alan*
SUBJECT: CRITICAL TECHNOLOGIES INSTITUTE

Here are some data and Q's and A's regarding the above mentioned Institute that we have been required to establish in OSTP by Congressional action.

I am providing similar information to Boskin, Darman and Porter and am seeking advice on how best to proceed.

I remain convinced that we can, if we use this wisely, evolve something that could be useful to the President and to the entire EOP.

Your comments, advice and suggestions would be most welcome.

Attachment

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

June 12, 1991

MEMORANDUM FOR THE RECORD

FROM: BILL WELLS *Wells*
SUBJECT: CRITICAL TECHNOLOGIES INSTITUTE

A number of considerations related to the Critical Technologies Institute are reviewed in this memorandum. A question and answer format is used to convey appropriate information and pertinent appendices are enclosed.

What Are the Origins of the Institute?

It seems to have emerged as an organizational concept from an extended series of hearings beginning in about 1988 held under the jurisdiction of the Senate Armed Services Committee, specifically the Subcommittee on Defense Industry and Technology, chaired by Senator Jeff Bingaman.

When Did it Appear as a Legislative Proposal?

The legislation for the Institute was drafted, as best I can determine, in the closing weeks of the First Session of the 101st Congress -- in the September-October 1990 time period.

Was OSTP Involved With the Legislative Proposal?

The short answer is no. But there is a longer answer. During that period, I had just stepped down from acting as Dr. Bromley's Chief of Staff but was still fully engaged with a range of FY 1991 legislative and budgetary matters in a consulting role. During October I was asked by congressional staff for OSTP comment and support on the legislation during the Senate-House conference process on the Defense Authorization. However, I declined on both counts and immediately brought the request to Bob Howard's attention -- personally, in a visit to his office.

Subsequently, in response to Bob Howard's request, Dr. Bromley and Bill Phillips visited Senator Bingaman to convey the Administration's opposition to the proposed legislation. To my knowledge, no written objection on the Institute legislative proposal was ever submitted by the Administration. We dealt only with Bob Howard and did not have discussions with Defense.

I have stated elsewhere -- and will again now -- that if we had been involved in drafting the legislation, it might well have come out rather differently and perhaps a little less complex. I am the most likely one to have been involved but I was not. Bill

Phillips and I did not meet with Senator Bingaman's staff to discuss implementation of the Institute until December, well after the legislation had been enacted into law on November 5, 1990.

What is the Statute That Establishes the Institute?

The Institute was established by the National Defense Authorization Act of Fiscal Year 1991 (P.L. 101-510), specifically Sec. 822. (42 USC 6686) A copy is enclosed as Appendix A.

What is the Prescribed Organizational Format?

The statute calls for the Critical Technologies Institute to be established as a non-profit corporation with a Board of Trustees composed of 21 members (11 public and 10 private sector). Further, the statute calls for the Institute to be established as a Federally Funded Research and Development Institute (FFRDC), with the Director of the Office of Science and Technology Policy being the sponsor.

What is the Significance of the FFRDC Requirement?

Currently there are 39 FFRDCs which have been established by the Federal Government. The general purpose of these entities is to perform a variety of specialized and focused R&D activities on behalf of the Federal Government as sole or principal client using appropriated funds. FFRDC employees are not federal employees. The expenditure of funds and use of contracts must be consistent with requirements prescribed by the Administrator for Federal Procurement Policy (currently Alan Burman with whom Bill Phillips and I have met along with his staff).

FFRDCs are established and operated according to OFPP Policy Letter 84-1, April 4, 1984, the current policy document on FFRDCs. A current list of FFRDCs is enclosed as Appendix B; a copy of the Policy Letter is Appendix C. A representative example of a Memorandum of Understanding between the FAA and MITRE on establishing an FFRDC is enclosed as Appendix D.

Section c.(1) of this Letter describes FFRDCs thusly: They "do not have a prescribed organizational structure. They can range from the traditional contractor-owned/contractor owned or Government-owned/contractor operated (GOCO) organizational structures to various degrees of contractor/Government control and ownership. Criteria for identification of an FFRDC are listed in this same section of the Letter. Also, in addition to these criteria, the relationship between the activity and the Government should exhibit a number of characteristics as outlined in Section c.(2) of the Letter.

What Are the Duties of the Institute as Called for in the Statute:

(1) **Survey the views** of United States industry, colleges, and universities, and Federal and State agencies, involved in research

and development, or the utilization of critical technologies as identified in the most recent biennial report of the National Critical Technologies Panel. Also to be surveyed are those technologies considered critical by the Institute on the basis of its analysis of national and worldwide trends.

(2) **After analysis by the Institute** identify suitable near-term, mid-term, and long-term national objectives for the research, development, and production capability of the United States with respect to such technologies. Then prepare possible strategies for achieving the identified objectives, including appropriate roles of industry, colleges and universities, and Federal and State agencies.

(3) **Publish reports**, as appropriate, discussing such national objectives and strategies as well as progress in implementing such strategies and achieving such objectives.

(4) **Provide technical support and assistance**, at the direction of the Director of the Office of Science and Technology Policy, to the committees and panels of FCCSET.

What was the Deadline Date in the Statute for Establishing the Institute?

The law called for a series of actions related to establishing the Institute to be accomplished not later than 90 days after enactment of the Act, November 5, 1990. This translated into about February 1991.

What Funds Were Appropriated for the Institute?

A total of \$5,000,000 was appropriated in Defense R&D for the Institute (2-year money).

What Actions Has OSTP Taken Relative to the Statute?

To date, OSTP activities have limited essentially to those of an exploratory nature. The two exceptions are these:

(1) Working with Senator Bingaman's staff and the Defense Department to obtain clarification on the use of the Fiscal Year 1991 funds appropriated for the Institute: the essence was to clarify availability of the funds through Fiscal Year 1992;

(2) Working with the White House Counsel's office on legal interpretation of the Board of Trustee arrangement called for in the statute and on a requested ethics opinion relative to my proposed appointment as an interim Acting Director for the Institute. No action has yet been taken on this matter other than the submission of a letter to Boyden Gray.

The exploratory activities have involved:

(1) Meeting with a number of organizations within and outside the government on the establishment and operations of FFRDCs and reaching a preliminary conclusion that the Institute should be established independently of existing FFRDCs; a partial listing of these organizations is in Appendix E.

(2) Meeting with a number of organizations that are interested in hosting or being involved with the Critical Technologies Institute; a partial listing also is listed in Appendix E.

(3) Several meetings with OMB on matters related to establishment of the Institute, including efforts aimed at clarification of its mission and relationship to the Executive Office.

(4) Meeting on a preliminary basis with external counsel who would be involved with the legal matters relative to establishing the Institute (e.g., filing for and obtaining a non-profit corporation charter, filing for an IRS non-profit tax status, etc.).

What is the Current Status of the Institute?

All activities related to establishment of the Institute have largely been placed on hold pending resolution of the discussions with OMB on how to proceed.

Is the Current Status of the Institute a Problem?

Not at the moment, but the chances of it becoming an embarrassing problem are increasing with each passing day without resolution of what course of action will be followed. In recent weeks, OSTP has responded to inquiries -- both informally and in Congressional hearings -- by stating that actions were underway to establish the Institute. Questions have been raised both by Senators Bingaman and Mikulski as well as by the House Science, Space and Technology Committee.

What is Wrong With the Institute Statute from the Administration's Perspective?

It would appear that those duties in the statute related to preparing possible strategies for achieving identified objectives and publishing reports discussing such strategies and objectives are incompatible with current Administration policy.

What Are the Basic Alternatives for Dealing with the Institute Statute At This Time?

(1) Seek a rescission of the funds appropriated for the Institute.

Pro: The Institute would be effectively killed for now.

Con: My view is that the time to have done this has passed and the political costs would be higher than desirable. Furthermore, I have strong doubts that it would succeed.

(2) Work with the Congress on defining a less ambitious scale of effort that might be mutually acceptable. More specifically, this would entail setting aside or giving only very minimal attention to the national strategy tasks including publishing reports on them. The major focus would be placed on the surveying and monitoring functions along with providing technical support and assistance to FCCSET and the EOP -- both through FCCSET and directly. An underlying premise would be to plan on continuity for the Institute into the future.

Pro: From earlier discussions with Senator Bingaman's staff in December, it is my view that they would be willing to show some flexibility. In short, the Institute would be redesigned to make it useful to the EOP while bowing only slightly in the direction of the more grandiose vision of the Congress.

Con: Once embarked upon this course of negotiation it becomes more difficult to design the Institute more to the Administration's liking if the negotiations fail.

(3) Follow a truncated interpretation of the Institute mission along the lines of alternative (2) but without discussing it in detail or in advance with the Congress. Again, an underlying premise would be continuity into the future.

Pro: Can show progress at an early date without getting into a protracted negotiation that might have a somewhat less desirable substantive outcome. If enough progress was being shown by the Institute in the more acceptable functions, the Congress might be willing to go along, if grudgingly. Also, it would seem that the House -- at least earlier -- was more interested in the FCCSET support function than national strategies in critical technologies.

Con: There is the chance of future heat from the Congress that we did not consult with them before significantly re-interpreting the statute. There has been a clear impression left with us in hearings and other inquiries about the Institute's status that they intended to keep a close eye on its establishment.

(4) Follow the truncated interpretation along the lines of alternative (3) but with the underlying premise that the Institute would not survive past Fiscal Year 1992. This would, in effect, mean a "little as possible effort": enough to show progress and to allay serious criticism but not enough to be considered vigorous.

Pro: This would effectively put the Institute on the "back burner" as far as the Administration is concerned; continuation would be solely in the Congressional court and given existing overt opposition to funding the Institute in the VA-HUD-Independent Agencies budget, it might not survive.

The Administration might even argue that until Congress had made up its mind firmly on the Institute it would be premature to jump into a program to be vigorously pursued.

Con: It might be very difficult to attract people of any calibre to the Institute if this strategy were to become known as the one being followed. There would inevitably be some political "heat" from the Congress at what could be seen as a "slow pace."

What Actually Would a Truncated Critical Technologies Institute Do?

Primarily, it would focus on the data gathering and technical support duties prescribed in the legislation; little, if any, effort would be placed on the strategic plans and objectives duties. Specifically, the Institute could, in response to direction from the EOP and the Board of Trustees:

- (1) Provide fora for dialogue among the Federal government, State and local government, and the private sector on technology issues as they relate to economic competitiveness.
- (2) Examine government-industry ways of working together (e.g., specific mechanisms) in science and technology and consider ways to improve their cooperative and mutually supportive efforts in meeting national needs.
- (3) Perform analyses, reviews, and data collection in support of OMB, OSTP, and other agencies within the EOP.
- (4) Perform analyses, reviews, and data collection in support of FCCSET.
- (5) Act as a catalyst and facilitator in working with the private sector, as well as gather information on private sector activities in the technological aspects of economic competitiveness.
- (6) Provide analytical and logistical support for subsequent legislatively-mandated biennial critical technologies reports.

How Could the Congressionally-Initiated Requirement Be Converted Into An Asset for the EOP?

It is possible to consider an on-going capability within the Critical Technologies Institute that could be somewhat more broadly based than focusing solely or narrowly on critical technologies. In short, it could become and be used as a more general policy research organization in direct support of the EOP. By virtue of being established directly under OSTP as its sponsor, the attributes of such an entity could include:

- (1) Rapid responsiveness to requests for information and studies for the EOP including OMB, OSTP and others.

- (2) Familiarity with presidential issues and processes.
- (3) Close interaction with EOP units including OMB and OSTP.
- (4) Coping with a wide range of assignments extending from day-to-day to longer-range responsibilities.
- (5) Possessing a high level of staff quality and expertise.
- (6) Capability for providing products with a high level of credibility.
- (7) Ability to assist in supporting analysis of cross-cutting programs and policies across various programmatic and policy boundaries.
- (8) Ability to provide objectivity, quality, and intellectual rigor.
- (9) Responsiveness in assisting the EOP in meeting its extensive workload and increasing responsibilities.
- (10) Flexibility, resilience, and adaptability in meeting changing priorities and workloads.
- (11) Systematic and comprehensive outreach to other expertise in information gathering and policy research.
- (12) Some degree of insulation from daily "fire-fighting."

IN SHORT, THE CRITICAL TECHNOLOGIES INSTITUTE COULD BE CONVERTED INTO AN ORGANIZATION THAT WOULD PROVIDE GREAT FLEXIBILITY AND ADDITIONAL EXPERTISE TO THE EOP IN A WIDE VARIETY OF WAYS -- FROM INFORMATION GATHERING TO POLICY RESEARCH.

What action/decisions are required in the near future?

A partial list of these is:

- (1) Decision on CTI formulation with OMB.
- (2) Decision on interim acting director plan.
- (3) Decision on organizational format.
- (4) Coordination of results of (1), (2), and (3) with other White House EOP units (CEA, NSC, CEQ, Space Council, Competitiveness Council, etc.
- (5) Preparation of a detailed activities plan.
- (6) Formal action to engage counsel.
- (7) Initiate series of actions related to legal establishment of

CTI:

- o Notice in Federal Register
 - o Non-profit corporation charter and by-laws
 - o Filing for IRS tax exemption
- (8) Selection of a location and host/administrative organization
- (9) Assuming selection of Alternative 2, initiate negotiations with Congress on re-casting the Institute mission.

10 USC 2508
note.

42 USC 6686.

development of such critical technology for the fiscal year preceding the first fiscal year covered by the plan."

(b) **APPLICABILITY.**—The amendments made by subsection (a) shall apply to annual defense critical technologies plans submitted after March 1, 1991.

SEC. 822. CRITICAL TECHNOLOGIES INSTITUTE

(a) **ESTABLISHMENT.**—There shall be established a federally funded research and development center to be known as the "Critical Technologies Institute" (hereinafter referred to in this section as the "Institute").

(b) **INCORPORATION.**—The Institute shall be incorporated as a nonprofit membership corporation.

(c) **BOARD OF TRUSTEES.**—(1) The Institute shall have a Board of Trustees (hereafter referred to in this section as the "Board") composed of 21 members as follows:

(A) The Director of the Office of Science and Technology Policy, who shall be Chairman of the Board.

(B) The Secretary of Defense, or the Secretary's designee.

(C) The Secretary of Energy, or the Secretary's designee.

(D) The Secretary of Health and Human Services, or the Secretary's designee.

(E) The Secretary of Commerce, or the Secretary's designee.

(F) The Administrator of the National Aeronautics and Space Administration, or the Administrator's designee.

(G) The Director of the National Science Foundation, or the Director's designee.

(H) Four members appointed by the Director of the Office of Science and Technology Policy from among the members of the Federal Coordinating Council on Science, Engineering, and Technology (other than members of such council named in subparagraphs (B) through (G)).

(I) Ten members appointed by the members of the Board referred to in subparagraphs (A) through (H) from among representatives of industry and colleges and universities in the United States.

(2)(A) The term of service of members of the Board appointed under paragraph (1)(H) shall be four years, except that of the four members first appointed, one shall be appointed for a term of one year, one shall be appointed for a term of two years, one shall be appointed for a term of three years, and one shall be appointed for a term of four years, as specified by the Director of the Office of Science and Technology Policy at the time of the appointments.

(B) The term of office for each of the members of the Board appointed under paragraph (1)(I) shall be specified by the appointing members of the Board at the time of appointment.

(C) Members of the Board may be reappointed.

(D) A vacancy in a membership of the Board appointed pursuant to subparagraph (H) or (I) of paragraph (1) shall be filled in the same manner as the original appointment. A member appointed under this subparagraph shall serve for the remainder of the unexpired term of his predecessor.

(3) The Board shall meet at least twice each year.

(4)(A) The Board shall have an executive committee composed of the members referred to in subparagraphs (A) through (G) of paragraph (1) and six of the members appointed pursuant to subparagraph (I) of such paragraph.

critical technology for the fiscal year covered by the plan." Amendments made by subsection (a) shall be included in the annual technologies plans submitted at the beginning of each year.

INSTITUTE

There shall be established a federally funded corporation to be known as the "National Critical Technologies Institute" hereafter referred to in this section as the "Institute".

The Institute shall be incorporated as a nonprofit corporation.

The Institute shall have a Board of Directors, hereinafter referred to in this section as the "Board".

The Board shall consist of the following members:

(1) the Director of the Office of Science and Technology Policy;

(2) the Secretary of Defense, or the Secretary's designee;

(3) the Secretary of Energy, or the Secretary's designee;

(4) the Secretary of Health and Human Services, or the Secretary's designee;

(5) the Secretary of the National Aeronautics and Space Administration, or the Secretary's designee;

(6) the President of the National Science Foundation, or the President's designee;

(7) the Director of the Office of Management and Budget, or the Director's designee;

(8) the Director of the Office of Science and Technology Policy, or the Director's designee;

(9) the Director of the Office of Science and Technology Policy, or the Director's designee;

(10) the Director of the Office of Science and Technology Policy, or the Director's designee;

(11) the Director of the Office of Science and Technology Policy, or the Director's designee;

(12) the Director of the Office of Science and Technology Policy, or the Director's designee;

(B) The executive committee shall meet at least six times each year.

(5) A member of the Board who is an officer or employee of the United States may not receive pay for service as a member, other than the pay provided for the member's position as an officer or employee of the United States.

(d) DUTIES OF THE INSTITUTE.—The Institute shall—

(1) survey the views of United States industry, colleges, and universities, and Federal and State agencies, involved in research, development, or utilization of critical technologies on—

(A) each critical technology identified in the most recent biennial report of the National Critical Technologies Panel established pursuant to section 601 of the National Science and Technology Policy, Organization, and Priorities Act of 1976 (42 U.S.C. 6681); and

(B) each technology that the Institute considers critical on the basis of its analysis of national and worldwide trends in basic and applied research and development;

(2) on the basis of such views and analysis by Institute personnel—

(A) identify suitable near-term, mid-term, and long-term national objectives for the research, development, and production capability of the United States with respect to such technologies; and

(B) prepare possible strategies for achieving the identified objectives, including a discussion of the appropriate roles of industry, colleges and universities, and Federal and State agencies;

(3) publish reports, as appropriate, discussing—

(A) such national objectives and strategies; and

(B) progress in implementing such strategies and achieving such objectives; and

(4) at the direction of the Director of the Office of Science and Technology Policy, provide technical support and assistance regarding policy formulation to the committees and panels of the Federal Coordinating Council for Science, Engineering, and Technology that are responsible for planning and coordinating Federal Government activities that advance the development of critical technologies and sustain and strengthen the science and technology base of the United States.

(e) SPONSORSHIP.—(1) The Director of the Office of Science and Technology shall be the sponsor of the Institute.

(2) The Director and the Board shall enter into a sponsor agreement consistent with the requirements prescribed by the Administrator for Federal Procurement Policy that are generally applicable to sponsor agreements.

(3) The sponsor agreement shall—

(A) require the Institute to perform such functions for the Office of Science and Technology Policy as the Director of that office may specify consistent with the requirements of subsection (d); and

(B) permit the Institute, subject to the concurrence of the Director, to perform functions for the member agencies of the Federal Coordinating Council on Science, Engineering, and Technology Policy.

(f) DEADLINE FOR CERTAIN ACTIONS.—The Director of the Office of Science and Technology Policy shall take such actions as may be

Reports.

Government contracts.

necessary to ensure that, not later than 90 days after the date of the enactment of this Act—

(1) the articles of incorporation for the Institute have been appropriately filed;

(2) the corporate bylaws have been adopted;

(3) the Board members have been identified or appointed, appropriate;

(4) the initial officers of the Institute have been elected;

(5) the first regular business meeting of the Board has been conducted; and

(6) the sponsor agreement referred to in subsection (e) has been entered into.

(g) FUNDING.—(1) Subject to such limitations as may be provided in appropriation Acts, the Secretary of Defense shall make available to the Director of the Office of Science and Technology Policy, out of funds available for the Department of Defense, \$5,000,000 for funding the activities of the Institute in the first fiscal year in which the Institute begins operations.

(2) There is authorized to be appropriated for the Institute for each fiscal year after the fiscal year referred to in paragraph (1) such sums as may be necessary for operation of the Institute.

SEC. 823. MANUFACTURING TECHNOLOGY

(a) IN GENERAL.—Title 10, United States Code, is amended—

(1) by redesignating chapter 149 as chapter 150;

(2) by redesignating section 2511 as section 2521; and

(3) by inserting after chapter 148 the following new chapter:

"CHAPTER 149—MANUFACTURING TECHNOLOGY

"Sec.

"2511. Definitions.

"2512. Management and planning.

"2513. National Defense Manufacturing Technology Plan.

"2514. Research and implementation.

"2515. Computer-integrated manufacturing technology.

"2516. Concurrent engineering.

"2517. Manufacturing extension programs.

"§ 2511. Definitions

"In this chapter:

"(1) The term 'manufacturing technology' means development of techniques and processes designed to improve manufacturing quality, productivity, and practices, including quality control, shop floor management, inventory management and worker training, as well as manufacturing equipment and software.

"(2) The term 'manufacturing extension programs' means publicly-chartered organizations and services to transfer technology and help modernize small manufacturers through research, education and training, and outreach activities.

"§ 2512. Management and planning

"The Secretary of Defense, acting through the Under Secretary of Defense for Acquisition, shall—

"(1) provide centralized Department of Defense policy guidance and direction to the military departments and the Defense Agencies on all matters relating to manufacturing technology; and

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federally funded research and development centers

The following is the master list of FFRDCs included in Federal Funds fiscal years 1988-90 survey. The list is arranged by sponsoring agency and administering organization.

department of defense

office of the secretary of defense

Administered by other nonprofit institutions:

Institute for Defense Analyses,
Arlington, VA
Logistics Management Institute,
Bethesda, MD
National Defense Research
Institute (RAND Corp.),¹
Santa Monica, CA

defense advanced research projects agency

Administered by universities and colleges:

Software Engineering Institute
(Carnegie Mellon University),
Pittsburgh, PA

department of the navy

Administered by other nonprofit institutions:

Center for Naval Analyses
(Hudson Institute), Arlington,
VA

department of the air force

Administered by universities and colleges:

Lincoln Laboratory
(Massachusetts Institute of
Technology), Lexington, MA

Administered by other nonprofit institutions:

Aerospace Corporation, El
Segundo, CA
C3 I Federal Contract Research
Center (MITRE Corp.),²
Bedford, MA
Project Air Force (RAND
Corp.),¹ Santa Monica, CA

department of the army

Administered by other nonprofit institutions:

Arroyo Center (RAND Corp.),¹
Santa Monica, CA

department of health and human services

national institutes of health

Administered by industrial firms:

Frederick Cancer Research
Facility (Program Resources,
Inc.; Bionetics Research, Inc.;
Harlan Sprague Dawley, Inc.;
Data Management Services,
Inc.), Frederick, MD

department of energy

Administered by industrial firms:

Bettis Atomic Power Laboratory
(Westinghouse-Electric Corp.),
Pittsburgh, PA
Hanford Engineering
Development Laboratory
(Westinghouse-Hanford
Corp.), Richland, WA
Idaho National Engineering
Laboratory (E.G.&G; Idaho;
Rockwell International Corp.;
Argonne National Laboratory,
West; Westinghouse Electric
Corp.), Idaho Falls, ID
Knolls Atomic Power Laboratory
(General Electric Co.),
Schenectady, NY
Energy Technology Engineering
Center (Rockwell International
Corp.), Canoga Park, CA
Oak Ridge National Laboratory
(Martin Marietta Energy
Systems Corp.), Oak Ridge, TN
Sandia National Laboratories
(AT&T Technologies, Inc.—
Sandia Corp.), Albuquerque,
NM
Savannah River Laboratory (E.I.
du Pont de Nemours & Co.),³
Aiken, SC

Administered by universities and colleges:

Ames Laboratory (Iowa State
University of Science and
Technology), Ames, IA

¹Three portions of the RAND Corporation were reported as FFRDCs: the Project Air Force, the National Defense Research Institute (formerly Defense Office of the Joint Chiefs of Staff), and the Arroyo Center. All other agency support to RAND was reported under "other nonprofit institutions excluding FFRDCs."

²Only the C3 I Division of the MITRE Corporation was reported as an FFRDC. All other agency support to MITRE was reported under "other nonprofit institutions excluding FFRDCs."

³As of April 1989, Westinghouse Savannah River Co. is the administering organization.

Argonne National Laboratory
(University of Chicago and
Argonne Universities Assn.),
Argonne, IL
Brookhaven National Laboratory
(Associated Universities, Inc.),
Upton, Long Island, NY
Continuous Electron Beam
Accelerator Facility
(Southeastern Universities
Research Association),
Newport News, VA
E.O. Lawrence Berkeley
Laboratory (University of
California), Berkeley, CA
E.O. Lawrence Livermore
National Laboratory
(University of California),
Livermore, CA
Fermilab (Universities Research
Association, Inc.), Batavia, IL
Los Alamos National Laboratory
(University of California), Los
Alamos, NM
Oak Ridge Associated
Universities, Oak Ridge, TN
Plasma Physics Laboratory

(Princeton University),
Princeton, NJ
Stanford Linear Accelerator
Center (Stanford University),
Stanford, CA

**Administered by other nonprofit
institutions:**

Inhalation Toxicology Research
Institute (Lovelace Medical
Foundation),⁴ Albuquerque,
NM

Pacific Northwest Laboratory
(Battelle Memorial Institute),
Richland, WA

Solar Energy Research Institute
(Midwest Research Institute),
Golden, CO

**national aeronautics and
space administration**

**Administered by universities and
colleges:**

Jet Propulsion Laboratory
(California Institute of
Technology), Pasadena, CA

⁴Established in FY 1989.

national science foundation

**Administered by universities and
colleges:**

National Astronomy and
Ionosphere Center (Cornell
University), Arecibo, PR
National Center for Atmospheric
Research (University
Corporation for Atmospheric
Research), Boulder, CO

National Optical Astronomy
Observatories (Association of
Universities for Research in
Astronomy, Inc.),⁵ Tucson,
AZ

National Radio Astronomy
Observatory (Associated
Universities, Inc.), Green
Bank, WV

⁵As of February 1984, this center includes three former
FFRDCs: Cerro Tololo Inter-American Observatory, Kitt Peak
National Observatory, and the National Solar Observatory
(formerly Sacramento Peak Observatory).



EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF MANAGEMENT AND BUDGET
WASHINGTON, D.C. 20503

OFFICE OF FEDERAL
PROCUREMENT
POLICY

APR 4 1984

OFPP POLICY LETTER 84-1

TO THE HEADS OF EXECUTIVE DEPARTMENTS AND ESTABLISHMENTS

SUBJECT: Federally Funded Research and Development Centers

1. Purpose. This policy letter establishes Government-wide policies for the establishment, use, periodic review, and termination of the sponsorship of Federally Funded Research and Development Centers (FFRDCs).
2. Supersession. Memorandum from the Chairman to the Members of the Federal Council for Science and Technology, dated November 1, 1967, which set forth criteria for identification of FFRDCs and the requirement for a master Government listing of these centers, is superseded by this policy letter.
3. Authority. This policy letter is being issued pursuant to Sections 6(a), 6(d)(1) and 6(d)(8) of the Office of Federal Procurement Policy Act, as amended, 41 U.S.C. 405 (a), (d)(1) and (d)(8), which empower the Administrator of OFPP to prescribe Government-wide procurement policies and to complete action on the recommendations of the Commission on Government Procurement.
4. Background. The Departments of Energy, Defense, Health and Human Services, the National Aeronautics and Space Administration and the National Science Foundation currently sponsor a total of 34 FFRDCs. Non-sponsoring departments and agencies also utilize these FFRDCs. Federal funding of FFRDC's currently exceeds 4 billion dollars per year.

In 1967, a Government-wide policy for the identification and maintenance of a master listing of these FFRDCs was issued (reference paragraph 2 - Supersession). In 1972, the Commission on Government Procurement recommended that the Federal Government keep open the option to organize and use FFRDCs to satisfy needs that cannot be satisfied effectively by other organizational resources. The Commission also recommended that agency heads periodically review the continuing need for existing FFRDCs and approve any proposal for new FFRDCs, with specific attention paid to the method of ultimate termination of sponsorship. This policy letter is based on the executive branch consideration of the Commission's recommendations.

5. Definitions

- a. Primary Sponsor -- The executive agency which manages, administers or monitors overall use of the FFRDC.

b. Sponsor means an executive agency which funds and monitors specific work of a continuing nature with an FFRDC and is party to a sponsoring agreement. Multiple sponsorship of an FFRDC is possible so long as one agency agrees to act as the primary sponsor for administrative purposes.

c. Federally Funded Research and Development Center (FFRDC).

(1) FFRDCs do not have a prescribed organizational structure. They can range from the traditional contractor-owned/contractor-operated or Government-owned/contractor-operated (GOCO) organizational structures to various degrees of contractor/Government control and ownership. In general, however, all of the following criteria should be met before an activity is identified as an FFRDC:

- (a) Performs, analyzes, integrates, supports (non-financial) and/or manages basic research, applied research, and/or development. (Activities primarily engaged in routine quality control and testing, routine service activities, production, mapping and surveys, and information dissemination, even though otherwise meeting the requirements of paragraph 5.c., are specifically excluded from FFRDC designation).
- (b) Performance of the functions in 5.c.(1)(a) is either upon the direct request of the Government or under a broad charter from the Government, but in either case the results are directly monitored by the Government. However, the monitoring shall not be such as to create a personal services relationship, or to cause disruptions that are detrimental to the productivity and/or quality of the FFRDC's work.
- (c) The majority of the activity's financial support (70% or more) is received from the Government with a single agency usually predominating in that financial support.
- (d) In general, most or all of the facilities are owned by the Government or funded, under contract, by the Government.
- (e) The activity is operated, managed and/or administered by either a university or consortium of universities, other non-profit organization or industrial firm as an autonomous organization or as an identifiable separate operating unit of a parent organization.
- (f) A long term relationship evidenced by specific agreement exists or is expected to exist between the operator, manager, or administrator of the activity and its primary sponsor.

- (2) In addition to the above criteria, the relationship between the activity and the Government should exhibit the following characteristics in order to qualify for FFRDC identification:
- (a) The activity (organization and/or facilities) is brought into existence at the initiative of a Government agency or bureau to meet some special research or development need which, at the time, cannot be met as effectively by existing in-house or contractor resources.
 - (b) Work from other than a sponsoring agency is undertaken only to the extent permitted by the sponsoring agency and in accordance with the procedures of the sponsoring agency.
 - (c) The activity, whether the operator of its own or a Government-owned facility, has access, beyond that which is common to the normal contractual relationship, to Government and/or supplier data, employees, and facilities needed to discharge its responsibilities efficiently and effectively, whether the data is sensitive/proprietary or not.
 - (d) The primary sponsor undertakes the responsibility to assure a reasonable continuity in the level of support to the activity consistent with the agency's need for the activity and the terms of the sponsoring agreement.
 - (e) The activity is required to conduct its business in a responsible manner befitting its special relationship with the Government, to operate in the public interest free from organizational conflict of interest, and to disclose its affairs (as an FFRDC) to the primary sponsor.

6. Policy.

a. General. Agencies will rely, to the extent practicable, on existing in-house and contractor sources for satisfying their special research or development needs consistent with established procedures under The Economy Act of 1932 (31 USC 1535), other statutory authority or procurement/assistance regulations. A thorough assessment of existing alternative sources for meeting these needs is especially important prior to establishing an FFRDC. This Policy Letter does not apply to the performance of commercial activities. Performance of commercial activities is governed by OMB Circular No. A-76.

b. Establishment of an FFRDC. In establishing an FFRDC, the sponsoring agency shall ensure that:

- (1) Existing alternative sources for satisfying agency requirements cannot effectively meet the special research or development needs (6.a).
- (2) At least three notices are placed over a 90-day period in the Commerce Business Daily and The Federal Register indicating the agency's intention to sponsor an FFRDC and the scope and nature of the effort to be performed by the FFRDC.
- (3) There is sufficient Government expertise available to adequately and objectively evaluate the work to be performed by the FFRDC.
- (4) Controls are established to ensure that the costs of the services being provided to the Government are reasonable.
- (5) The responsibility for capitalization of the FFRDC has been defined in such a manner that ownership of assets may be readily and equitably determined upon termination of the FFRDC relationship with its sponsor(s).
- (6) The purpose, mission and general scope of effort of the FFRDC is stated clearly enough to enable differentiation between work which should be performed by the FFRDC and that which should be performed by a non-FFRDC.

11 c. Sponsoring Agreements. When FFRDCs are established, long-term Government relationships are encouraged in order to provide the continuity that will attract high quality personnel to the FFRDC. This relationship should be of a type to encourage the FFRDC to maintain currency in its field(s) of expertise, maintain its objectivity and independence, preserve its familiarity with the needs of its sponsor(s), and provide a quick response capability. A contract is the generally preferred instrument under which an FFRDC accomplishes effort for its sponsor(s). However, there may be instances where other legal instruments may be appropriate. A written agreement of sponsorship between the FFRDC and its sponsor or primary sponsor where more than one sponsor is involved may be used in addition to the contract or other legal instrument under which an FFRDC accomplishes effort. The specific content of a sponsoring agreement will vary depending on the situation. However, there are certain areas common to all situations that must be addressed. The following requirements must be addressed in either a contract, a sponsoring agreement or sponsoring agency's policies and procedures.

(1) Mandatory Requirements

- X X (a) A delineation of the purpose for which the FFRDC is being brought into being along with a description of its mission, general scope of effort envisioned to be performed, and the role the FFRDC is to have in accomplishment of the sponsoring agency's mission. This delineation must be consistent with the definition of an FFRDC set forth in paragraph 5.c(1)(a) and will be sufficiently descriptive so that work to be performed by the FFRDC can be determined to be within the purpose, mission and general scope of effort for which the FFRDC was established and differentiated from work which should be performed by a non-FFRDC. This delineation shall constitute the base against which changes in an existing FFRDC's purpose, mission or general scope of effort will be measured.
- (b) Provisions for the orderly termination or nonrenewal of the agreement, disposal of assets and settlement of liabilities. The term of the sponsoring agreement will not exceed five years but can be renewed, as a result of periodic review, in not to exceed five year increments.
- X (c) A prohibition against the FFRDC competing with any non-FFRDC concern in response to a Federal agency formal Request For Proposal for other than the operation of an FFRDC. This prohibition is not required to be applied to any parent organization or other subsidiary of the parent organization in its non-FFRDC operations. However, sponsoring agencies may expand this prohibition as they determine necessary and appropriate.
- (d) A delineation of whether or not the FFRDC may accept work from other than the sponsor(s). If non-sponsor work can be accepted, a delineation of the procedures to be followed along with any limitations as to the clients (other Federal agencies, State or local governments, non-profit or profit organizations, etc.) from which work may be accepted. Limitations and procedures with respect to responding to requests for information as to an FFRDC's capabilities or qualifications are inherently a part of the "work for others" question and will be addressed by the sponsoring agency.

(2) Other Requirements As Appropriate

- (a) When cost type contracts are used, the sponsor(s) should identify any cost elements which will require advance agreement. Such items may be, but are not necessarily limited to, salary structure, depreciation, various indirect costs such as independent research and development or others as determined appropriate by the sponsor(s).
- (b) Where fees are determined by the sponsor(s) to be appropriate, considerations which will affect their negotiation should be identified. Such considerations may be, but are not necessarily limited to, weighted guidelines, risks, use of Government furnished property and facilities, needs or others as determined appropriate by the sponsor(s).

(c) Other provisions as determined appropriate by the sponsor(s).

d. Changing the Basic Scope of an Existing FFRDC's Sponsoring Agreement. In changing the purpose, mission and general scope of effort to be performed or role of an existing FFRDC as set forth in its sponsoring agreement (see 6.c.(1)(a)), the sponsoring agency shall make such changes consistent with its statutory authority and the requirements for establishing a new FFRDC as set forth in paragraph 6.b.

e. Use of the FFRDC by the Sponsor or Primary Sponsor in the Case of Multiple Agency Sponsorship. The sponsor, or primary sponsor in the case of multiple sponsorship, will ensure that all work it places with its FFRDC(s) is within the purpose, mission, and general scope of effort of the FFRDC (paragraph 6.c.) and in accordance with this Policy Letter. This includes work a sponsoring agency agrees to accept from a non-sponsoring Federal agency under the provisions of The Economy Act of 1932 (31 USC 1535) or other statutory authority. Sponsoring agencies must comply with applicable procurement or assistance statutes, policies and regulations for non-competitive actions before placing work which is outside the scope of the sponsor's contractual or sponsoring agreement with an FFRDC.

f. Use of an Existing FFRDC by a Non-Sponsoring Federal Agency. Non-sponsoring Federal agencies may use an FFRDC only if the terms of the FFRDC's sponsoring agreement or contract permit work from other than a sponsoring agency. Where use by a non-sponsor is permitted by the Sponsoring Agreement, the work must require the special relationship of an FFRDC as defined in paragraph 5.c. and either be treated as a direct procurement (action) or processed under The Economy Act of 1932 (31 USC 1535) or other statutory authority. Work processed under The Economy Act of 1932 (31 USC 1535) or other statutory authority must clearly fall within the purpose, mission and general scope of effort established by the sponsoring agency for the FFRDC (paragraph 6.c.). Processing under the Economy Act or other statutory authority is subject to agreement by the receiving agency. Non-sponsoring agencies must fully comply with procurement or assistance statutes, policies and regulations for non-competitive actions prior to placing work directly with a specific FFRDC. The FFRDC must comply with the procedures established by the sponsoring agency (paragraph 6.c.(1)(d)) before accepting work from a non-sponsoring Federal agency.

g. Use of an Existing FFRDC by Other Than a Federal Agency. Work from other than a Federal agency may be accepted only to the extent permitted by the sponsoring agency. The FFRDC must comply with the procedures established by the sponsoring agency (paragraph 6.c.(1)(d)) before accepting work from other than a Federal agency.

h. Consulting Services. Agencies sponsoring FFRDC work which constitutes consulting services, as defined by OMB Circular No. A-120, will comply with the provisions of that Circular.

i. Production/Manufacturing. FFRDCs will not be asked to perform quantity production and manufacturing work unless authorized by legislation. Such activities as breadboarding, modeling or other tasks inherent to R&D are permissible.

171
X j. Periodic Review. Prior to renewal of a sponsoring agreement, agencies shall conduct a comprehensive review of their use and need for each FFRDC that they sponsor. Where multiple agency sponsorship exists this review will be a coordinated interagency effort. When the funding for an FFRDC is a specific line item within the sponsoring agency's budget, the comprehensive review may be done in conjunction with the budget process or the review may be done separately. The sponsoring agency(s) shall apprise other agencies who use the FFRDC of the scheduled review and afford them an opportunity to assume sponsorship in the event the current sponsorship is determined no longer appropriate. Final approval to continue or terminate an agency's sponsorship arrangement with a given FFRDC as a result of this review shall rest with the head of that sponsoring agency. The results of this review will be formally documented. The periodic review should include:

- (1) An examination of the agency's special technical needs and mission requirements to determine if and at what level they continue to exist.
- (2) Consideration of alternative sources to meet the agency's needs. Such consideration will include compliance with the Notice and Publication requirements of P.L. 98-72 (15 USC 637(e)) prior to renewal of the contract or Sponsoring Agreement unless otherwise exempted.
- (3) An assessment of the efficiency and effectiveness of the FFRDC in meeting the agency's needs.
- (4) An assessment of the adequacy of the FFRDC management in assuring a cost effective operation.
- (5) A determination that the guidelines of section 6 are being satisfied.

k. Termination or nonrenewal of an FFRDC Relationship. When a sponsor's need for the FFRDC no longer exists, the sponsorship may be transferred to one or more Government agencies, if appropriately justified. Otherwise it shall be phased out, the assets disposed of and all liabilities settled as provided by the terms and conditions of the sponsoring agreement.

7. Action Requirements.

a. Not later than September 30, 1984, each agency currently sponsoring an FFRDC will review the terms of its existing agreements with the FFRDCs for compliance with this policy letter. Where existing agreements do not comply with this policy letter the primary sponsor will develop a schedule to bring the agreements into compliance not later than the next contract renewal or five years from the effective date of this policy letter, whichever comes first.

b. Where the review required by 7.a. reveals that a clear statement of the purpose, mission and general scope of effort, as described in paragraph 6.b.(6) and 6.c.(1)(a), does not exist, the sponsoring agency shall ensure such a statement is developed not later than September 30, 1984.

c. The primary sponsor will notify the Office of Science and Technology Policy prior to designating any new organization as an FFRDC (paragraph 6.b.), changing the basic scope of effort of an existing FFRDC (paragraph 6.d.) or changing the status of an existing FFRDC (paragraph 6.k.).

d. The National Science Foundation will maintain a master Government list of FFRDCs based upon the definition in this Policy Letter.

e. FFRDCs will be identified by their primary sponsors who will provide information, including funding data, on the type of R&D being performed by the FFRDCs to the National Science Foundation upon their request for such information.

f. Each agency head is responsible for ensuring that the provisions of this policy are followed.

8. Effective Date. The Policy Letter is effective (60 days after publication in the Federal Register).

9. Implementation. Aspects of this policy letter requiring implementation will be covered by the Department of Defense, the General Services Administration and the National Aeronautics and Space Administration in the Federal Acquisition Regulation not later than 180 days from the date of this policy letter. Implementation will be written so as to be compatible with the requirements, as of the date of this policy letter, of FAR 17.6 "Management and Operating Contracts" when the arrangement with an FFRDC constitutes a management and operating contract.

10. Information Contact. All questions or inquiries about this policy letter should be submitted to the Office of Management and Budget, Office of Federal Procurement Policy, telephone (202) 395-6810.

11. Sunset Review Date. This policy letter will be reviewed no later than six years after its effective date for extension, modification, or rescission.

Donald E. Sowle
Donald E. Sowle
Administrator

17

MEMORANDUM OF AGREEMENT
BETWEEN
FEDERAL AVIATION ADMINISTRATION
AND
THE MITRE CORPORATION

SECTION I. PURPOSE OF MEMORANDUM

This Memorandum of Agreement (MOA) documents:

A. The Federal Aviation Administration's (FAA) sponsorship of The MITRE Corporation (MITRE) to operate a Federally Funded Research and Development Center (FFRDC). The FFRDC is designated as the FAA's "Center for Advanced Aviation System Development" hereinafter referenced as the "Center." The term "Center" encompasses both the resources and activities of the FFRDC. The purpose of this MOA is to charter the FFRDC and define its scope, while the purpose of the formal contract is to provide an instrument for accomplishing and funding the Center work plan.

B. MITRE's agreement to operate the Center.

C. That, except for those aspects of the FFRDC which require a formal contract, this MOA represents the primary accord and understanding between the FAA and The MITRE Corporation as to formation and operation of the Center. As such it constitutes the sponsoring agreement within the meaning of FFRDC legal and regulatory guidance. Principal among these aspects on the part of the Government, and hence made a part of this sponsoring agreement as regards FAA, are: Recognition that the relationship is intended to be a long-range one and hence requires the FAA to have an interest in the development and vitality (qualitative growth) of the Center and its personnel and in the provision of sufficient physical and financial resources for the corporation to maintain and develop the technical skills of the organization. Contract continuity, as well as reasonable funding stability from year to year, is also in FAA's interest to promote because of the economy that stability of staffing levels provides and the staff effectiveness it encourages.

SECTION II. BACKGROUND, MISSION, PURPOSE AND SCOPE
OF THE CENTER

A. Background

An FFRDC executes activities that are sponsored under a broad charter by a Government agency (or agencies) for the purpose of performing, analyzing, integrating, supporting, and/or managing basic or applied research and/or development. FFRDCs are operated, managed, and/or administered by either a university or consortium of universities, other not-for-profit or nonprofit

organizations, or an industrial firm, as an autonomous organization or as an identifiable separate operating unit of a parent organization. In this agreement, the FAA is the primary sponsor of the Center activity which will be operated as an identifiable, separate operating unit of The MITRE Corporation.

B. Mission

The mission of the Center is to conduct a continuing program of NAS research and development, and engineering to meet the FAA's long- and short-term requirements.

C. Purpose of the Center

The Center is being created to assist the FAA in addressing the long- and short-term evolutionary changes necessary to modernize the NAS. The process of system development and associated support for system acquisition, implementation, and enhancements call for extensive technical and engineering support which can only be offered within the context of an FFRDC. FAA anticipates that the continuity of effort will: (1) attract and retain high quality professionals, (2) encourage the FFRDC to maintain currency in its fields of expertise, (3) maintain objectivity and independence of judgment, (4) preserve familiarity with the needs of the FAA, (5) provide a quick response capability in addition to providing basic long-term support to the FAA's strategic mission, and (6) maintain an ongoing research and technology base.

D. Scope

The Center's specific functions are as follows:

1. The validation of proposed NAS operational requirements by the development of operational concepts and by the assessment of alternative, feasible, and technological approaches to meeting proposed requirements in cost-effective ways.
2. The conduct of analyses of the operations of the current and eventual NAS, with special emphasis on the detailed operational implications of the various incremental steps in the transition to the eventual system.
3. The conceptual formulation, feasibility determination, and prototype development of enhancements to the Air Traffic Control (ATC) System.
4. The conduct of engineering studies and ATC performance analyses during the development and acquisition phases of NAS hardware and software subsystems to determine the operational acceptability of contractor-proposed designs.

5. The development of operational test and interface requirements and the evaluation (observation and analysis of procedures, requirements, and performance) of test results to assure the operational acceptability of each phase of the NAS, as it is augmented by developed subsystems.

6. The periodic analysis and reporting on the effectiveness, efficiency, and safety of the operational ATC system.

SECTION III. GENERAL UNDERSTANDINGS

The following general understandings are agreed to in implementing this sponsorship agreement:

A. The FAA agrees to be the primary sponsor for the Center's activities; that is, to fund and monitor specific work of a continuing nature and be party to a sponsoring agreement. The relationship is anticipated to be long-term and will be carried out in accordance with guidance provided in Federal Acquisition Regulation (FAR).

B. MITRE will establish an identifiable, separate operating unit, reporting to the office of the president of The MITRE Corporation. The operating unit's responsibility will be to operate the FAA's FFRDC. This operating unit will ensure that an infrastructure exists to meet the needs and requirements of the FAA. This operating unit will disclose its affairs as an FFRDC to the FAA.

C. The FAA will be responsible for the establishment, funding, direction, and implementation of its own work program with MITRE.

D. As primary sponsor, the FAA will act to resolve policy matters with secondary sponsors and nonsponsors, if applicable, which may arise regarding Center activity. The FAA will lead discussions with interested parties to resolve matters which affect the performance of the Center.

E. The companion contract to this MOA is cost-reimbursable. All cost elements have been identified and addressed in the negotiation of the existing cost-reimbursable contract.

F. The MITRE Corporation is a nonstock, not-for-profit corporation which has been organized to ensure that none of its assets will inure directly or indirectly to the benefit of any private individual or entity. The accumulations since inception of Residual Management Allowances (discretionary fees less expenditures for unallowable cost) and other income over total costs and expenses represents MITRE's capital (retained earnings). MITRE capital is utilized to fulfill working capital and fixed capital (depreciated value of real and personal property) requirements. It is MITRE's intent to assure, over time, an equitable

distribution of capital to the Center by disclosing to the FAA, on an annual basis, how MITRE utilized capital in the prior year and MITRE's capital plans for the next year and the required funding for currently approved capital plans.

G. It is understood, that in the event of a major downsizing or a nonrenewal of the FAA FFRDC, MITRE's personal and real property will remain the property of The MITRE Corporation and will be utilized to support the remaining Government sponsors.

H. In the event of total dissolution of The Corporation, the Trustees will, in accordance with The MITRE Corporation's Certificate of Incorporation, transfer "remaining property and assets ... to the United States of America"

I. The type of work governed by this MOA consists of engineering and technical services procured to ensure more efficient or effective operation of planned or existing systems as part of normal development. These efforts do not constitute advisory and assistance services and are exempted from the requirements of OMB Circular A-120 regarding guidelines for such services, in accordance with paragraph 5A(4).

J. The FAA and MITRE agree to the institution of an independent, mission-oriented research and development program, officially titled "Mission Oriented Investigation and Experimentation (MOIE) Program," which would be funded as an indirect cost element of the contract. MITRE would brief the FAA annually concerning (1) the results of its MOIE program as it pertains to Center activities over the preceding year and (2) proposed MOIE program activities for the coming year. Funding for any MOIE program would be determined by contractual negotiation.

SECTION IV. FAA OVERSIGHT OF CENTER ACTIVITIES

FAA oversight of Center activities will provide for the setting of broad program direction, oversight of ongoing development programs, review of annual work plans, and recurrent assessment of the Center's efficiency and effectiveness. This will permit: (1) adequate and objective evaluation of the work to be performed by the FFRDC on a continuous basis and (2) the conducting of periodic reviews on the use and need for an FFRDC. The management structure consists of the following elements:

A. The FFRDC Executive Committee, chaired by the Deputy Administrator, will meet annually to formulate and review goals and objectives of the Center program and to rule on broad policy matters. The Executive Directors will comprise the majority of committee membership, with one or two members, as necessary, from the private sector with relevant credentials, serving in an advisory capacity. Specific representation will be determined by the Executive Committee and reviewed periodically.

B. The FFRDC Steering Committee will be chaired by the Executive Director for System Development, and staffed by the Associate Administrators for System Engineering and Development, Air Traffic, NAS Development, Airway Facilities, Administration, Aviation Standards, and Regulation and Certification (or their functional equivalents). The Center Director, described in section V, is a member of the Steering Committee. The purposes of the Steering Committee will be to review and approve the work plan for formal incorporation into the contract, determine resource allocations within the total available contract staff years, and accept major new work proposals from within FAA or from outside secondary sponsors or nonsponsors for consideration.

C. The Program Manager (PM) will be responsible for daily coordination with the Center. The PM will administer the MOA in accordance with guidance of the Executive Committee and Steering Committee. The PM will also prepare the annual work plan, make determinations as to the extent of new or ad hoc requirements and related technical scope issues, and specifically oversee the business and financial aspects of programmatic operations. The PM will serve as the Executive Secretary for Executive Committee and Steering Committee meetings, taking full responsibility for agenda and scheduling.

D. The Contracting Officer will administer the existing companion contract to this MOA, including modifications and determinations on contractual scope issues. The Contracting Officer will attend all Executive Committee and Steering Committee meetings.

SECTION V. CENTER OPERATIONS

A. The Center Director

1. The role of the Center Director will include, but will not be limited to, the following: (a) focusing MITRE manpower and skills to maximize the efficiency of Center activities, (b) helping reflect the consequences of the decisions reached at oversight meetings, and (c) assuring that the program support decisions and the decisions made on the MOIE program are consistent with each other. Program guidance for the Center Director will be found in the annual work plan, as incorporated in the contract.

2. The Center Director will participate in major discussions on matters relating to elements of the Center program.

3. The FAA will make the Center Director aware of all issues which bear on the performance of the Center in order that the Center Director may develop a productive and effective program.

B. Center Environment

1. The Center will promote technical excellence, as well as achieve operating efficiencies and maintain an overall cost-effective operation.

2. The Center will maintain a technical library which shall be a repository for appropriate studies and analyses and other related material required for the work to be performed under the companion contract to this MOA.

3. The physical environment of the Center shall not be limited to The MITRE Corporation facilities. The activities and working environment of the Center may include FAA headquarters, regions, Technical Center, and MITRE facilities. As such, subject to the availability of space, no restrictions may be placed on the movement or siting (relocation) of personnel or equipment between Government and The MITRE Corporation sites as necessary to advance the work of the Center. Notwithstanding the foregoing, no facilities will be utilized by the Government to obtain equipment or space for its own direct use (i.e., a "pass-through" arrangement).

C. Work Appropriate for the Center

Consistent with the limitations of this MOA, the Center may undertake work for other sponsors or clients, both domestic and foreign, which may include government organizations or nonprofit entities which serve the public interest. In general, these involve public interest tasks of a technical or technical management nature which require a continuous, intimate, overview relationship with a given sponsor in some broad agency mission area in order for that sponsor to best accomplish the mission. Advance approval by the FAA, as primary sponsor, is required for sponsored or nonsponsored work and will be granted only under circumstances in which: (1) the FAA technical mission benefits from the additional work and (2) the mission of the Center is not negatively impacted.

D. Avoidance of Organizational Conflict of Interest

The Center is required to conduct its business in a manner befitting its special relationship with the Government, to operate in the public interest with objectivity and independence, to be free from organizational conflicts of interest, and to have full disclosure of its affairs to the sponsoring agency. In order to avoid organizational conflict of interest:

1. The Center shall not engage in the manufacture, production, or sale of hardware or software. The assembly or fabrication of prototypes, or test equipment required to perform development tests, are not included in this prohibition.

2. The Center shall not formally compete with any non-FFRDC concern in response to a Federal agency formal Request for Proposal for other

than the operation of an FFRDC. This prohibition does not apply to any parent of the Center or other subsidiary of the parent organization in its non-FFRDC operations.

3. The Center shall not disclose proprietary information coming into its possession to any individual, corporation, or organization, other than its own employees or sponsors, without the prior approval of the FAA.

4. The MITRE Corporation will advise FAA of any relevant changes in the overall scope of its mission, tasking, or work programs for other organizations, and the potential impact, if any, on MITRE's operation of the Center activity.

5. The Center shall take no advantage of its access to sensitive Government and proprietary industrial data and will use extreme care to protect and safeguard such data.

E. Center Access to Information

The FAA will provide, subject to appropriate security procedures, prompt and systematic access to pertinent policy documents, business sensitive data (for example, contractor cost and pricing data submitted to FAA), and other data/briefings affecting studies and analyses being performed by the Center.

F. Dissemination of Center Work Products

1. MITRE shall be responsible to the FAA with regard to the progress and quality of specific NAS development efforts undertaken by the Center. The Center staff will be guided by the highest standards of professional integrity and competence. Accordingly, reports on the results of contractual efforts will normally be distributed regardless of the findings.

2. The FAA may ask the Center to participate in research, studies, or investigations in sensitive areas to which access is closely controlled. A free, ongoing discourse between Center and FAA personnel is encouraged and essential.

3. After clearance by means of an information security review, material which does not contain proprietary information may be published in open literature. Center staff members will be encouraged to publish the results of their work in professional journals, since it is valuable to have the quality of such work subject to peer scrutiny, and to elicit the interest of the professional communities in FAA/Center projects. All articles will disassociate the FAA from their contents by the inclusion of a statement that the views are those of the author or The MITRE Corporation and are not necessarily in accord with the views of the FAA or the Department of Transportation.

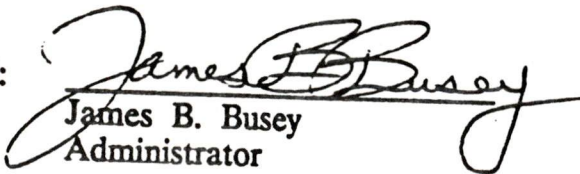
SECTION VI PERIOD OF AGREEMENT AND TERMINATION PROVISIONS

This MOA shall be effective when subscribed by both parties and will be in force for a renewable five-year period, unless otherwise superseded by mutual agreement or unilaterally terminated by the Government, whichever occurs first. Upon identification of Center special termination costs by MITRE, the parties agree to negotiate and definitize provisions for disposal of assets and settlement of liabilities. In any case, disposal of assets and settlement of liabilities, if required, will be conducted in accordance with the applicable statutes, regulations, the current contract, and/or any other appropriate vehicle.

FEDERAL AVIATION ADMINISTRATION

THE MITRE CORPORATION

BY:


James B. Busey
Administrator

BY:


Charles A. Zraket
President & Chief
Executive Officer

DATE:

9/26/90

DATE:

9/25/90

APPENDIX E

Partial Listing of Organizations Consulted on Establishment of the Critical Technologies Institute

Government Organizations

Defense Department General Counsel

FAA: Has established the most recent FFRDC at MITRE

National Cancer Institute: FFRDC, Frederick, MD. An example of an FFRDC established with private contractors.

Office of Federal Procurement Policy

Non-Governmental Organizations: Discussion Re Hosting/Administering of the CTI.

Battelle

MITRE

Center for Naval Analysis

Smithsonian

AAAS

Carnegie Institution

Johns Hopkins University

IDA

SRI

Hudson Institute

National Center for Advanced Technology

TASC (firm handling Critical Technology Panel logistics)

THE WHITE HOUSE
WASHINGTON

June 18, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR JOHN H. SUNUNU

FROM: D. ALLAN BROMLEY

Alan

SUBJECT: DRAFT ARTICLE FOR SCIENCE

Attached is the draft article on science and technology policy written for Science that you and I have discussed. I have sent it for review to the Vice President, Dick Darman, Michael Boskin, Brent Scowcroft, Roger Porter, and Andy Card, with a request for comments by the end of the day Monday, June 24. Yours would be most appreciated!

Attachment

DRAFT

[June 18, 1991]

SCIENCE AND TECHNOLOGY IN THE BUSH ADMINISTRATION

by D. Allan Bromley

One of the most important policy initiatives of the Bush Administration -- though it has gone largely unnoticed by the general public -- has been its promotion of science and technology. If Congress enacts the President's most recent budget proposals, funding for federal nondefense research and development will have gone up over 50 percent since George Bush's election, and defense R&D will have risen about 10 percent even as growth in the defense budget has slowed. Moreover, the President has taken a number of steps to increase the coordination of federal science and technology, to consult with the private sector on federal science and technology policies, and to more fully introduce considerations of science and technology into broader policy issues. In general, the Bush Administration has been strengthening the foundations of science and technology in ways that will pay dividends for years to come.

Though he claims to have only a modest understanding of science and technology, President Bush has long been interested in these subjects. He spoke often about science and technology during his campaign, and the personnel decisions he made after his election reflected that interest. Chief of Staff John Sununu is a Ph.D. mechanical engineer; Budget Director Richard Darman has long been an advocate of federal support for science, space, and technology programs; Council of Economic Advisors Chairman Michael Boskin, a Stanford economics professor, has written often about the importance of technological development to economic growth; Roger Porter, who is the first assistant to the President

with responsibility for both economic and domestic policy, has helped develop a domestic agenda that features science and technology; and Brent Scowcroft, the Assistant to the President for National Security Affairs, has a great interest in the confluence of science, technology, and national security. Furthermore, the President has put together an executive office in which the various individuals and agencies work together to an unprecedented degree, at both the staff and executive levels, on issues that extend beyond single areas of concern. Though the science advisor may have the highest visibility in the science and engineering communities, the progress now being made in science and technology would not be possible without the efforts and early planning of many other individuals within the Executive Office of the President.

During his campaign, President Bush also promised to appoint a Council of Advisors on Science and Technology, and PCAST has been meeting monthly for over a year at the White House. The President and other members of the White House senior staff sit in on portions of virtually all those meetings, providing a valuable opportunity for private sector input directly to the highest levels of the Executive Branch. The President has also greatly strengthened my position and that of the Office of Science and Technology Policy, making me the Assistant to the President for Science and Technology and nominating all four legislatively authorized OSTP Associate Directors for the first time in the office's history.

In addition, with the President's strong support, the Federal Coordinating Council for Science, Engineering, and Technology (FCCSET) has been restructured and revitalized, and the Cabinet secretaries and Directors of the departments and independent agencies involved with science and technology have become the Council's members. FCCSET is the internal, federal interagency body, with roots dating back to the Eisenhower Administration, that is charged with coordinating federal activities in science and technology that cut across the missions

of more than any one federal agency. Often overlooked in the past, FCCSET has the potential to make far-reaching changes in the federal government's coordination and integration of science and technology. It can organize integrated multiagency plans in specific areas -- as it has recently done for global change, for high performance computing and communications, and for science and mathematics education, with similar efforts under way for biotechnology and for materials science and engineering -- while retaining the traditional strengths of a pluralistic R&D enterprise. It can also identify, analyze, and introduce issues of science and technology into other areas of federal policymaking within the White House, in the rest of the Executive Branch, and in Congress.

Bolstered by this strengthened science and technology policy apparatus, the federal government's approach to science and technology has been undergoing evolutionary changes consistent with a vision that President Bush and his senior advisors began to spell out well before his election. I would propose to illustrate such changes by looking at three broad areas of current concern: the support of academic research, the federal government's R&D portfolio, and the development of a federal technology policy.

The Academic Research Enterprise

The United States makes greater demands on its research universities than does any other nation, and the success of our research universities in meeting those demands has helped to build the strongest science and technology enterprise that the world has ever known. One measure of this success is the influence of the academic research enterprise compared to its overall size. According to data gathered by the National Science Foundation, colleges and universities conduct less than 10 percent of the research and development done in the United States

(measured in terms of funding alone). Yet these institutions are the primary source of the new observations, new ideas, and new techniques that underpin the remainder of the science and technology enterprise and contribute so heavily to economic growth, to an improved quality of life, and to our national security. NSF data also indicate that academic scientists and engineers who do research as their primary or secondary work activity make up fewer than 5 percent of the total number of scientists and engineers in the United States. Yet they train virtually all future research scientists and engineers and are involved in the training of a large fraction of the scientists and engineers who become involved in activities other than research.

The importance of the academic research enterprise to the nation's future prosperity and security is reflected in the funding trends of the 1980s. Total R&D expenditures at colleges and universities rose from \$6 billion in 1980 to \$14 billion in 1989, an increase of over 50 percent in constant dollars. Over that same period, federal funding of R&D at academic institutions rose from about \$4 billion to about \$9 billion (35 percent in real terms); therefore, other sources of funding -- state and local governments, industry, and the institutions' own funds -- rose even faster than did federal spending. As a result of these increases, more researchers are now being supported at the nation's colleges and universities than have ever been supported in history.

It may seem paradoxical, given these increases in funding, that the academic research community should consider itself to be in a state of acute distress, with some commentators suggesting that the future vitality of the enterprise is at stake. There appear to be several interrelated factors at play. First, we are undoubtedly the victims of our own success. Progress in research has generated an unprecedented number of opportunities in science, and our success at training academic researchers has produced many young people who are more than ready to grasp those

opportunities. Though available levels of funding have increased, the numbers of opportunities and researchers have increased even faster.

A number of other, interrelated factors have also increased pressures on academic researchers. Larger numbers of researchers are submitting multiple proposals and amended proposals, creating a proposal pressure that has stressed the peer review system. In addition, the decision at NIH to lengthen the duration of grants, a decision endorsed by investigators, has created outyear mortgages that have reduced funding for new awards and new investigators. In some areas, the costs of doing increasingly sophisticated research have gone up faster than the usually quoted Consumer Price Index (CPI) rate of inflation. New organizational arrangements in research universities, such as the greater use of nonteaching researchers and the development of the "entrepreneurial" principal investigator, have created structural stresses on the system. New but necessary regulations have brought increased administrative costs, which have further drained funds from the support of research. Obviously, given the complexity of the issues involved, there can be no simple solutions to these problems.

The economic and social utility of research should be kept in mind. A recent study by the distinguished economist Edwin Mansfield of the University of Pennsylvania calculated the social rate of return on federal support of academic research to be in the 25 to 40 percent range. (The social rate of return is defined as the benefits that producers and consumers receive from new products and processes, including those benefits not reflected in market prices.) This economic indicator is a very important one, and one that the science and engineering communities have long needed.

It is essential, however, that potential or actual rate of returns not obscure the other important rationales for both fundamental and applied research. Such activities -- pushing back the frontiers of human ignorance -- are among the greatest

adventures available to our species. They are integral parts of our culture and are part of what separates us from all other species on our planet.

The Bush Administration, recognizing the pivotal role of academic research, has moved forward on two broad fronts to strengthen this component of the R&D system. First, it has proposed substantial increases for the federal support of university-based research, and these increases have been structured with particular emphasis on individual investigators. Of the 18 percent increase requested for the National Science Foundation in the President's FY 1992 budget request, over 80 percent would go directly to individual investigators and their research infrastructure. At the National Institutes of Health, FY 1992 funding for research project grants is slated to grow by 9 percent while the overall NIH budget grows by 6 percent. And at a time of declining defense budgets, the Department of Defense's University Research Initiative has been protected from budget cuts.

The Bush Administration is also committed to ensuring that the mechanisms of federal support for academic research are the most appropriate ones for the needs of the nation and the needs of the research universities. Within the Executive Office and through FCCSET and PCAST, the Administration has been conducting a broad analysis of the mechanisms of federal support for academic research. For example, through a Working Group on the Structure of Science Support, FCCSET has been examining historical trends in federal R&D funding by the purpose of that funding and the mode in which it is distributed. This analysis will be used by FCCSET to provide input to policy discussions concerning future directions in federal support.

One of the important distinctions being examined by the FCCSET working group has been that between disciplinary research and thematic research. The working group defines disciplinary research as research driven entirely by the pursuit of knowledge and by individual curiosity. This research typically takes place

within formal academic disciplines and is guided by the history and traditions of that discipline.

Thematic research, on the other hand, is guided by a particular goal or national need, such as the need to understand global climate change, the goal of deciphering the human genome, the economic promise of high performance computing, or the challenge of confronting the AIDS epidemic. Thematic research is not necessarily applied or strategic research, since basic or fundamental research is integral to addressing these needs. But it is driven by factors other than the pure intellectual curiosity of the researcher and generally cuts across a number of scientific disciplines, including those of the social and behavioral sciences.

According to the working group, support for thematic research at universities has grown faster during the 1980s than has that for disciplinary research in some areas. [We are trying to get overall numbers from the working group, though they may not be available for several months.] In part, this reflects the increasing integration of science and technology into our society and the demand that science and technology address important regional, national, and international needs. For example, the U.S. Global Change Research Program and the high performance computing and communications initiative, which are both highlights of the 1992 budget submission, constitute an acceleration of this trend. However, the increasing role of thematic research may also contribute to the frustration felt by many in the disciplinary research community.

Disciplinary research remains an absolutely vital component of the research system because it is the most fruitful source of new knowledge in science and because it exerts very effective quality controls on the rest of the system. At the same time, thematic research has become an essential source of the knowledge needed to address many of today's most pressing national and international problems. The challenge for policymakers, administrators, and researchers is to balance these two types of

activity to best serve the public interest.

The Government's R&D Portfolio

Achieving balance within the academic research community is just one aspect of a much broader process of evaluation and priority setting that goes on continually within the federal government. Support for academic research and development constitutes only about a third of the federal government's total support for nondefense R&D (and less than a sixth of the government's support for both civilian and defense R&D, including about \$1 billion of defense money that goes to universities). The rest goes toward a tremendously diverse set of other activities, from small grants for work conducted in nonacademic settings to the work of the national laboratories to large projects that serve broad groups of researchers, often referred to as megaprojects.

These megaprojects are especially visible within the scientific community and to the general public, but there are many difficulties in using them to draw a sharp distinction between large science and small science. Large projects include both single facilities (the Superconducting Super Collider) and coordinated programs of research being done by individual investigators (the Human Genome Project). Some large projects pursue disciplinary research (e.g., telescopes or light sources) while others are focused on thematic research (the U.S. Global Change Research Program).

The large projects now being undertaken will provide the tools that individual investigators will need to reach the frontiers of their fields five or ten years down the road. The people who will use these facilities are typically individual faculty members with a few assistants and/or students, and their research will be indistinguishable from that done in other locations. The projects are initiated from the bottom up,

through proposals submitted by groups of researchers to the appropriate federal agencies.

Many people both inside and outside of the scientific community have called for these projects, together with the ensemble of all science R&D activities, to be judged by a given set of criteria and assigned a priority, presumably so that items can be cut from the bottom of the list when funding is short. In fact, it is not meaningful to rank order these projects in any one-dimensional linear array. Different categories of R&D activities must be judged by different selection and evaluation criteria. Disciplinary research projects, for example, are selected primarily on the basis of their scientific merit to the discipline in question, whereas thematic projects are selected for the combined scientific merit and relevance to the overall goals of the program.

Other large projects, such as the space station and the Moon-Mars Initiative, have never been primarily science projects, though for the purposes of the budget they may be categorized entirely as research and development. Rather, they are justified primarily on the basis of such considerations as exploring physical frontiers, inspiring students to enter science and technology, or maintaining national leadership in a given area.

The vast majority of defense R&D is judged by yet another set of criteria -- the need to develop, test, and evaluate new and improved weapons and support systems. Less than 10 percent of the Defense Department's R&D budget goes for basic and applied research that can be judged by many of the same criteria applied to nondefense R&D. In this sense, it can be misleading to compare the relative size of the defense and nondefense R&D budgets; the more relevant question is whether each category of support is enough to meet national needs.

In providing for the nation's security, we need a defense research base that will guard against technological surprise and will keep the United States in the lead in uncovering the rare revolutionary technology breakthroughs that define tomorrow's

military advantage. The defense community also needs an effective means of sustaining and exploiting evolutionary improvements in weapons technologies.

As Desert Storm reminded us, America's tremendous scientific and technological strength provides the qualitative edge that has long ensured the nation's deterrent and helped preserve the peace. The conflict in the Gulf, the dramatic developments under way in Eastern Europe, and the continuing uncertainty in the Soviet Union presage far-reaching changes in the international environment and in the security needs of the West. With the globalization of technology and the spread of weapons of mass destruction, even a relatively undeveloped society can threaten the United States and its allies. The development and application of technology to support changing defense, foreign policy, and intelligence requirements are central Bush Administration concerns.

Currently a PCAST panel is examining the appropriate roles of science and technology for national security in the vastly changed international situation that has developed over the past eighteen months. OSTP and NSC are cooperating to provide support for this panel.

Because of the different criteria used to judge various R&D activities, the budget submitted by the President to the Congress each year should not be seen as a list of projects ranked by priority (although a cascade of priority decisions enter into the budget). Rather, it is best viewed as the Administration's attempt to achieve the most effective and balanced R&D portfolio possible. In the process, the Executive Office of the President -- and particularly OMB and OSTP -- have a unique opportunity to examine the entire R&D budget and address the critically important issue of overall balance among its components. Along the way, many difficult choices must be made. Excellent projects in worthy fields may need to be delayed or abandoned because they do not contribute as much to the whole as does some other project. Any one project may contribute to several objectives,

or a project that may not be of "high priority" by itself may play a critical role in balancing the portfolio.

OMB, working closely with the federal agencies, clearly bears the primary responsibility for the development of the President's budget. OSTP provides input and advice throughout the process in matters relating to science and technology, as does the Council of Economic Advisors on matters relating to economic policies. Final decisions on matters that have not been resolved at lower levels in the system are quite properly made by the President.

If Congress mandates a different level or allocation of R&D funding than the President has proposed, I would argue that it should do so in ways that maintain the overall balance of the R&D portfolio. For example, cutting a large project from the R&D budget can seriously skew the distribution of resources and personnel. The Congress and Administration must work closely together in maintaining the health and integrity of the R&D enterprise.

Another Congressional action that can distort the distribution of R&D resources is the unrequested appropriation of funds for specific R&D projects or facilities -- a practice commonly known as earmarking. According to an analysis of the FY 1991 budget conducted within my office, about \$427 million was appropriated for such projects at universities in 1991. Earmarked projects typically do not undergo merit review, and thus their potential for contributing to scientific progress is often unknown. In the present era of tight budgets and spending caps, earmarking has the effect of substituting projects of unknown scientific merit for ones that have had careful examination of their scientific merits and thus threatens to weaken the nation's R&D effort.

The impossibility of prioritizing all forms of science and technology according to a single set of criteria does not imply that more focused prioritizations are not useful. In particular, priority setting by the scientific and engineering communities is

an invaluable aid in establishing a balanced R&D portfolio. In recent years, several subdisciplines and some disciplines within science and engineering have been able to establish priorities within their fields. For example, the astronomers and astrophysicists have recently produced an excellent list of priorities under NAS sponsorship, as did the physicists in an earlier survey in the 1970s. Now the need is for scientists to establish priorities within broader disciplines -- and to contribute to the inevitably political task of setting priorities across disciplines.

In preparing its budget, the Administration must also strike a balance between R&D activities and the other functions of government. Research and development now account for about one seventh of the total domestic nondefense discretionary spending; the President is proposing that this fraction be increased. In the FY 1992 budget, for example, he proposed a 13 percent increase in R&D, despite the overall domestic discretionary spending being capped at roughly the rate of inflation by last year's budget agreement. Frank Press, in a recent article in the Boston Globe, described the budget as having "stronger support for science than any in recent memory." However, in what is effectively a zero sum game (in constant dollars), the R&D component is very visible and very vulnerable to attack by other strongly motivated, competing constituencies.

The shift of funds from consumption to investment that is reflected in the Bush Administration's support of R&D represents an important aspect of the Administration's commitment to what the President has termed "the next American century." Politically, such a shift will not be easy to accomplish -- as I shall describe below -- but the commitment marks an important step in the federal government's view of its responsibilities.

Federal Technology Policy

The federal government provides much more support for applied research and technology development than it does for basic research. This work is largely directed toward meeting the federal government's own needs and the needs of the public in such areas as defense, space, health, and environmental protection. But this work, together with the basic research that underlies it, is also important to the public sector in developing the new products and processes that fuel economic growth.

Because of the importance of technology to the goals of both the public and private sectors, the Bush Administration has taken a number of steps to strengthen its development and deployment. It has sought to create a financial environment that is conducive to longer-term investment in technology, through lowering the federal budget deficit, proposing to cut the capital gains tax, and protecting intellectual property through international negotiations. It has encouraged technology transfer and research cooperation, particularly involving small and mid-sized companies. It has sought to remove legal and regulatory barriers to innovation and private sector investments in research and development. It has proposed making the research and experimentation tax credit for private firms both permanent and more broadly applicable. And it has focused on education, which is perhaps the single most important factor in ensuring the long-term competitiveness of our nation's industries.

The federal government's support of research and development is an integral part of its technology policy. Through its support of basic research, it helps generate the new knowledge that will lead to future technologies and helps train the scientists and engineers who will develop and use those technologies. The federal government also has a role in supporting research on generic, precompetitive technologies that have the potential to contribute to a broad range of government

and commercial applications. The government's rationale for investing in these technologies is essentially the same as that for investing in basic research -- namely, that while the benefits of these technologies are widespread in society, no single firm can appropriate enough of the returns to justify -- by itself -- an adequate level of investment.

A useful test as to whether a technology is precompetitive is whether a company is willing to spend money on it in a cooperative joint venture with its competitors. The results from precompetitive technology investigations can be shared by a group of companies without reducing the incentives for any of them to further develop competitive proprietary products based on the work.

Specific examples of precompetitive technologies can be found in the initial round of awards made by the Advanced Technology Program, which is administered by the National Institute of Standards and Technology within the Department of Commerce. Eleven projects were selected (Table 1) out of 249 proposals received (totaling \$122 million in requests for the first year). These projects were selected after a rigorous peer review process involving both technical and commercial assessments. They will receive \$9.2 million in federal funds during the first year, with the companies contributing more than 50 percent of the total cost.

An obvious question is why the federal government should fund even part of the cost of these projects. The answer is that these projects would very probably not be done at all if left to private industry. Some are too far from commercial development for their commercial potential to be assessed. For others, individual firms cannot capture enough of the benefits to justify the necessary investment. With federal cost sharing, however, the risks can be shared and the expertise of private industry can be tapped to select promising commercial technologies.

At the same time, the federal government does not believe that it has an appropriate role in targeting particular

industries for support or particular technologies for commercialization. The private sector has the principal role in innovation and in identifying and developing technologies for commercial products and processes. Even in meeting the government's own needs, the government relies primarily on the private sector to undertake the development process and encourages these activities to be managed in such a way as to allow commercial applications of the resulting R&D.

The Advanced Technology Program is just one element in a wide-ranging federal approach to civilian and defense technology development. Other elements include the Engineering Research Centers, Science and Technology Centers, and Industry/University Cooperative Research Centers sponsored by the National Science Foundation; support of SEMATECH, the National Center for Manufacturing Sciences, and other partnerships led by the private sector to advance technology development; the Regional Manufacturing Technology Centers run by the Department of Commerce and other outreach efforts designed to reduce the barriers to the adoption of new technologies; and more widely based efforts at the over 700 federal laboratories to encourage technology transfer from the government to private industry.

In particular, the federal laboratories and their staffs represent a unique American resource of know-how, technology, and facilities. We have been less successful than we might have been, however, in exploiting this resource in support of national goals. The coupling between the laboratories and the private sector -- particularly small and mid-sized businesses -- has been less than would have been desirable, although substantial progress has been made in recent years.

This is particularly the case at the input end of the decision-making process in the laboratories. While many laboratories have rather elaborate visiting committee mechanisms that bring distinguished members of the academic and industrial sectors into the laboratories to provide overall quality control and peer review of the research products and programs, such

external bodies have little, if any, influence on the selection of those research projects that are actually undertaken and those that are, for whatever reason, passed over. If such consultations were introduced at the outset, the probability of external interest in, and eventual use of, the products of research would be substantially enhanced.

What Scientists and Engineers Can Do

In general, the Bush Administration has laid out what we believe to be a coherent and forward-looking science and technology policy. But the Administration is just one actor among many -- including Congress, the science and engineering communities, and the public -- that determine the nation's overall science and technology policy. It is in the interaction among these constituencies that the nation's approach to science and technology is forged.

One thing that continually amazes me about our system of government is how truly representative the system is, at both the executive and legislative levels. Political decisions are rarely made without a substantial base of consensus. As Benjamin Franklin once said, "In America the people govern -- if they want to."

According to the National Science Foundation, there are more than 5 million scientists and engineers in the United States -- numerically more than three times the number of American lawyers and physicians combined. There is no reason why this group cannot be as effective a constituency as the much smaller groups that successfully promote other forms of federal spending. But effective advocacy will require a fundamental shift in the attitudes of scientists and engineers. Scientists and engineers can no longer sit at home or in their laboratories and trust that someone in Washington will eventually realize how important their work is to the future of the nation. There are too many other

claimants for federal funds, almost all of them with what may well appear to be more immediate needs than those represented by the long-term investments required for science and technology.

Congress has been extremely foresighted in funding science and technology, and many members of Congress agree with the Administration that this nation is underinvesting in research and development. But Congressmen are under intense pressure from a large number of groups, and in the tight budget climate of the next few years they are going to have to make difficult decisions. Scientists and engineers must make their voices heard if the promise of science and technology is to be realized. Representative George Brown, chairman of the House Science, Space, and Technology Committee, was once asked if scientists and engineers tend to forget who their congressmen are at election time. "Forget?" Brown answered. "They don't know who they are in the first place." Any scientist or engineer who cannot pass this simple test of political literacy has very little right to criticize federal actions affecting science and technology.

At the same time, the federal government supports less than half of the research and development conducted in this country, which argues for a very broad-based approach to public outreach. I believe that every scientist, regardless of his or her position, should view public education as part of his or her job description. This broad civic responsibility is not expected of other professions. But science and technology demand an unusual measure of public involvement, both because of the public's support for these activities and because of the broad influence of these activities on the public.

I believe that we are about to enter a period of unprecedented productivity for science and technology. More than ever before, science and technology will be key elements in addressing a broad range of national issues, from defense to health to competitiveness to education. The Bush Administration recognizes the contributions that science and technology can make to these problems, and it is taking steps to ensure that the

appropriate science and technology will be available to meet the challenge.

Table 1 Initial Round of ATP Awards

Project	Applicant
Single Applicants	
Precision optics for soft X-ray projection lithography	AT&T Bell Laboratories
Computer interface for cursive handwriting recognition	Communication Intelligence Corp.
Nonvolatile magnetoresistive semiconductor technology	Nonvolatile Electronics, Inc.
Tunable UV/VUV solid state laser	Light Age, Inc.
Machine tool compensation techniques	Saginaw Machine Systems, Inc.
Thallium superconductor thin film processing	Du Pont Company
Joint Ventures	
Printed wiring board interconnects	National Center for Manufacturing Sciences
Holographic mass storage	Microelectronics and Computer Technology Corporation
Flat panel display manufacturing	Advanced Display Manufacturers of America Research Corporation
Solid state laser technology for point source X-ray lithography	Hampshire Inc., and McDonnell Douglas Electronic Systems Co.
Short wavelength sources for optical recording	National Storage Industry Consortium

THE WHITE HOUSE
WASHINGTON

THE CHIEF of STAFF
has seen

July 8, 1991

MEMORANDUM FOR JOHN H. SUNUNU

FROM: D. ALLAN BROMLEY 

SUBJECT: MY YALE LEAVE

I have just been notified that on the basis of your letter to Benno Schmitt, the Yale Corporation has been pleased to extend my leave from my Henry Ford II Professorship of Physics for the 1991-1992 academic year.

Many thanks for your help.

THE WHITE HOUSE

WASHINGTON

June 19, 1991

Dear President Schmidt,

With the imminent completion of Allan Bromley's original two year leave of absence from his position as Henry Ford II Professor of Physics at Yale, I write to you, at the request of President Bush, to ask that this leave be extended for the 1991-1992 academic year in order that Allan can continue to serve in his position as Assistant to the President for Science and Technology.

I am happy to certify to you and to the Yale Corporation that his "continued service is vital to the national interest."

Sincerely,

A handwritten signature in dark ink, appearing to read "John H. Sununu", written in a cursive style.

John H. Sununu
Chief of Staff

Professor Benno C. Schmidt
President
Yale University
Woodbridge Hall
New Haven, Connecticut 06511

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
01. Memo	From Nancy Maynard to John Sununu Re: Meeting w/Global Change Scientists - Follow-up (2 pp.)	6/7/91	P5	

Collection:

Record Group: Bush Presidential Records
Office: Chief of Staff to the President, Office of the
Series: Sununu, John, Files
Subseries: White House Offices File
WHORM Cat.:
File Location: Science & Technology
 (Bromley) (1991) [4]

Open on Expiration of PRA
 (Document Follows)
 By JP (NLGB) on 10/28/05

Date Closed:	12/29/2004	OA/ID Number:	29184-004
FOIA/SYS Case #:	1998-0004-F[2]	Appeal Case #:	
Re-review Case #:	2005-0426-S	Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
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 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
 P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

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 (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
 (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
 (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

June 7, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: NANCY G. MAYNARD *nm*
SUBJECT: Meeting with Global Change Scientists - Follow-up

The purpose of this memo is to provide you with summary notes from your meeting on Wednesday, June 5 with the global warming scientists from the CATO Institute Conference. For your reference, I have summarized the main issues which were addressed as well as listed the scientific articles which were discussed. I have attached a copy of those articles which were immediately available and will make sure that the others are forwarded to you as soon as available.

The main issues addressed during the meeting were related to both policy issues as well as basic science questions in climate change. A summary of these issues follows, including a few suggestions for possible responses to their requests/comments:

1. The politics of the global warming issue in the science community

These scientists represent a community who have been somewhat outspoken on the global warming issue, maintaining that perhaps the popular view of the issue (IPCC science and/or warming could cause very negative effects) is wrong. Due to the fact that this approach is somewhat different from the conventional view, and, of course, because this is an emotional issue, the debate has been rather heated, particularly, in the past couple of years.

The scientists in this meeting stated that they felt, because of their approach to this issue, they are discriminated against in the funding process (proposal review), in the scientific paper review process, and in hearings on the Hill.

Possible solutions:

a. As you suggested, arrangements could be made to provide a more sympathetic hearing on the Hill for this community on the global warming issue. You suggested that Congressman Dingell might be interested in having such a hearing.

b. We could provide an opportunity to bring representatives from both science communities together on an even playing field such as a scientific conference/debate where each side might be asked to address specific scientific data sets and their interpretation of those data. This would include such things as the models, the various temperature data sets, and other pertinent ground and space based data.

While it may not resolve any differences, it may give this group an opportunity that they may feel that they have not had to discuss their differences in a "legitimate" scientific forum. In addition, they might feel that they have been given an opportunity for a "fairer" hearing in the science and science policy communities.

The annual meeting of the American Geophysical Union (AGU), held in December in San Francisco, would be a good forum for such a debate because it would provide the kind of intellectual setting that this group is seeking. If you would like to explore this idea further, there are several other options available for holding a debate of this kind.

2. Scientific Papers and Data Sets Discussed

The group mentioned several interesting science aspects of global warming which are presently being debated in the literature, including: (1) paleo data which shows there may have been more water vapor during glacial periods (implying that there could be less during warmer events), (2) the relationship between sulfates and clouds, (3) interpretation of the satellite measurements of global atmospheric temperatures, (4) interpretation of the ground-based temperature measurements, (5) the effects of nighttime warming versus daytime warming, (implications for the melting of polar ice), and (6) the correlations between historic and modelled climate change.

During the discussion, there were several new papers referred to (some still in manuscript form) which address these issues. Attached, where available, are copies of the new papers plus some of the earlier background papers for your reference. Other papers are being sent to you this week. Listed below are the topics covered by the papers:

1. Paleo data on water vapor during glacial periods (to be sent)
2. Sulfates and clouds (to be sent)
3. Satellite measurements of global atmospheric temperatures (Tab A)
4. Ground-based temperature measurements - 100-year data set and urbanization effects (Tab B and to be sent)
5. Nighttime warming versus daytime warming and effects (Tab C and to be sent)
6. The ocean conveyor belt theory (Tab D and to be sent)
7. The Gore 6-month temperature update (Tab E)

3. Other issues discussed

Other issues addressed briefly during the meeting include: (1) ways to improve marketing of the US approach to the global warming issue, (2) industry and the global change issue, (3) the US and the international community on global change, (4) difficulties with the NRC/NAS as true representatives of the scientific community - in committees and in reports, (4) Administration policy and the NRC report, "Policy Implications of Global Warming", (5) small science versus big science.

As you know, Dr. Bromley is heavily involved in these issues and, of course, would be very pleased to discuss possible future actions with you on Monday upon his return. If you would like any additional material or information, we would be very pleased to provide it to you.

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

June 3, 1991

MEMORANDUM FOR D. ALLAN BROMLEY

FROM: EUGENE WONG *E. Wong*
SUBJECT: Talking Points on High Performance Computing and Communications

1. Program

- . Presidential initiative for FY 92
- . 5-year budget plan, starting at \$638 million
- . 8 participating agencies (DARPA, DOE, NASA, NSF, EPA, NIH, NIST, NOAA) working within FCCSET
- . 4 major components:
 - . systems
 - . applications
 - . networking
 - . human resources

2. Prominent Features

- . Massively parallel architecture -- teraop machines by 1995
- . Grand Challenge applications -- human genome, climate modelling, drug design
- . giga-bit network

3. **Strong Private Sector Support**

- . natural constituencies: universities, national labs, industry
- . catalytic effect: computer industry, telecommunications, modelling/visualization, computational sciences
- . interaction: PCAST panel
CSPP (Computer Systems Policy Project: 11 top computer CEOs)

4. **Legislation**

- . strong Congressional support
- . 3 pending bills (marked up by committees)
 - . Senate Commerce (Gore)
 - . Senate Energy (Johnston)
 - . House Science (Brown/Walker)
- . Administration position
 - . Gore bill -- not acceptable: micromanagement, rigid, distorted view of federal role
 - . Johnston bill -- acceptable, a generic bill providing endorsement
 - . Brown/Walker -- 90% acceptable, result of extensive staff interaction

5. **Opportunity for Administration Leadership**

- . Initiative entirely one of Administration's effort and leadership
- . Highly visible and popular -- opportunity to claim deserved credit
- . Continued leadership necessary -- attempts in Congress to control and distort program, especially networking
- . Propose Presidential event at CalTech: to visit the Touchstone Delta System that was installed last week. Ran a standard benchmark at 8.6 giga-ops (world record) -- confirmation of continued U.S. supremacy in this area and subject of New York Times article on May 31, 1991 (attached).

EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

June 6, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: NANCY G. MAYNARD *NM*

SUBJECT: Tomorrow: NOAA Announcement of Findings on
Listing of 4 Salmon Runs

During your earlier discussions with Dr. Bromley on the listing of the Sockeye Salmon as an Endangered Species, you had indicated an interest in remaining informed on the progress of this issue. This memo is just a reminder that NOAA will make an announcement tomorrow to state their proposed actions in response to petitions received last year to list four stocks of chinook and coho salmon under the Endangered Species Act. It is conceivable that there may be some press attention given to the issue.

Background:

On June 7, 1990, NOAA received petitions to list four runs/stocks of salmon (Snake River spring, summer, and fall chinook salmon and lower Columbia River coho salmon) under the Endangered Species Act. Findings on these petitions are due tomorrow, June 7, 1991, and, at that time, an announcement (press release) will be made by NOAA on these finding. It is my understanding that NOAA will be providing you with specific information on this listing later today.

The announcement tomorrow does not establish these populations as endangered, but it sets into motion the next steps (to take place in one year) which determine the nature of the final listing.

The process:

These findings will announce the results of NOAA's determination regarding these salmon populations based upon their review of the biology and status of the runs. Once these findings have been announced, the proposed rules to start the formal listing process together with their findings will be published in the Federal Register. This is followed by a 60-day comment period. In addition, public hearings will be held this summer. NOAA has one year in which to make the final decision regarding the listing of these specific salmon stocks.

THE WHITE HOUSE

WASHINGTON

May 6, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR JOHN H. SUNUNU

FROM: D. ALLAN BROMLEY *Alan*
SUBJECT: SCORING FOR NSF ANTARCTIC ACTIVITIES

You asked me to provide you with information on this scoring question.

Enclosed herewith are the following:

a) A copy of Bernthal's September 1990 memo to me outlining the original problem. For quite understandable reasons OMB ruled against 050 scoring at a time when many activities were being presented for such treatment. The net impact on NSF was a roughly \$40 million reduction in the funding available to support research activity.

b) An NSF prepared precis of the 1992 question outlining the estimate for capital and logistic requirements for the US Antarctic Program (USAP) over the next decade--together with the February 5, 1982 President's memorandum regarding USAP.

c) A more detailed suggested justification again prepared by NSF for scoring the capital and logistics aspects of USAP against 050.

d) A brief summary prepared by NSF at my request outlining who uses and who benefits from the USAP.

I have discussed the matter briefly with Dick Darman and he remains opposed to 050 scoring. He suggested that he was prepared to consider rescoring if I could come up with somewhere else in the budget that could be tapped legitimately.

So far I have no suggestion that appears workable. Your suggestion that we might be able to obtain the 9 LC-130's and the 6 helicopters in the NSF listing from DOD would reduce the \$1.4 billion total by 610 million leaving 790 million still for NSF to handle.

I realize the difficulties here but given the President's strong commitment to double NSF's budget I hope that we can work out some way to prevent this substantial diversion of what would otherwise be available to NSF for direct research funding.

Enclosures

(a)

NATIONAL SCIENCE FOUNDATION
WASHINGTON D.C. 20550


OFFICE OF THE
DIRECTOR

M E M O R A N D U M

DATE: October 23, 1990

TO: Dr. D. Allan Bromley
Assistant to the President for Science
and Technology Policy

FROM: Dr. Frederick M. Bernthal 
Acting Director, NSF

SUBJECT: FY91 Appropriations Decisions Regarding
U.S. Antarctic Program

I. Background

- o Last Year (FY90), the VA-HUD Appropriations Subcommittees split the NSF's Antarctic request into two accounts-- Antarctic Logistical Support and Antarctic Program Activities. The former account for Logistics comprises our reimbursement to DOD.
- o For FY91, the NSF again requested a single Antarctic account requesting \$175 million. In our justification to the Appropriations Committees (USAP-3), we stated, however, that \$75 million was for Logistical Support:

...The breakout of Logistical Support for the FY91 Request includes only those funds for reimbursement of the Department of Defense.

- o During the past several months, both Appropriations Subcommittees requested funds from the Defense function (Function 050) to cover this \$75 million. (An 050 allocation is made to a number of domestic subcommittees to cover items in their bills that are defense-related). Under the Budget Summit Agreement, the Office of Management and Budget (OMB) is the final arbiter of what is an appropriate 050 expenditure.
- o Several days ago, the Subcommittee apparently received word from OMB that OMB would not accept scoring this \$75 million as an 050 expenditure. We have also been told that other subcommittees were trying to secure 050 funding for activities that OMB would not score as legitimate defense-related activities.

- As a result of OMB's scoring decision on the \$75 million in NSF's Antarctic account, the VA-HUD Subcommittee amended the conference report on the floor (10/20/90), reducing NSF's Research and Related account by \$40 million. (The rest came from other parts of the bill). The impact of that reduction was to reduce our research increase from about 9% to 6% over FY90 levels; the agency's overall increase dropped from 13.2% to around 11%.

II. Issues

- The \$75M for Logistical Support, now scored in Function 250, is a straight pass-through from NSF to DOD for equipment and personnel to support the US Antarctic Program.
- Any savings in Function 250 will allow more real "S&T" growth for NSF (as well as NASA and the SSC).
- Present scoring decision could be considered at variance with Presidential Memorandum 6646 (2/5/82) on US Antarctic Policy and Programs:

To ensure that the United States Antarctic Program is not funded at the expense of other National Science Foundation programs, the OMB will provide specific budgetary guidance for the Antarctic Program...

III. Action Necessary

- VA-HUD Conference Report has not moved to Senate Floor.
- If other Conference Reports that had problems relating to scoring 050 expenditures could be handled by Congress first, and if OMB could revisit and reconsider the scoring of NSF's \$75 million expenditure as defense-related, Conference Report might be restored to original NSF level for research. (If above is possible, Senate Appropriations Committee should be notified immediately.)
- OMB may have other mechanisms by which restoration of these funds could be considered.

(b)

Antarctic Scoring Issue

Given upcoming capital and logistic needs in the Antarctic program, it is imperative that in the FY 1992 budget process the Administration "score" the Antarctic logistics account (NSF's reimbursement to DOD for personnel and other support) as a defense or 050 account.

Over the next ten years, total capital and logistic requirements for USAP could total \$1.4 billion.

NSF reimbursement of DOD @ \$75M per year	\$675M
Procurement of up to 9 LC-130	\$450M
Procurement of 6 helicopters	\$160M
South Pole Station Reconstruction	\$100M
Environmental Clean Up	\$100M

APPENDIX 2

President's memorandum regarding Antarctica

Memorandum 6646

February 5, 1982

THE WHITE HOUSE WASHINGTON

MEMORANDUM FOR THE SECRETARY OF STATE
THE SECRETARY OF THE TREASURY
THE SECRETARY OF DEFENSE
THE SECRETARY OF THE INTERIOR
THE SECRETARY OF COMMERCE
THE SECRETARY OF TRANSPORTATION
THE SECRETARY OF ENERGY
THE DIRECTOR, OFFICE OF MANAGEMENT AND BUDGET
THE DIRECTOR OF CENTRAL INTELLIGENCE
CHAIRMAN, JOINT CHIEFS OF STAFF
DIRECTOR, ARMS CONTROL AND DISARMAMENT AGENCY
DIRECTOR, OFFICE OF SCIENCE AND TECHNOLOGY POLICY
ADMINISTRATOR, ENVIRONMENTAL PROTECTION AGENCY
DIRECTOR, NATIONAL SCIENCE FOUNDATION

SUBJECT: United States Antarctic Policy and Programs

I have reviewed the Antarctic Policy Group's study of United States interests in Antarctica and related policy and program considerations, as forwarded by the Department of State on November 13, 1981, and have decided that:

- The United States Antarctic Program shall be maintained at a level providing an active and influential presence in Antarctica designed to support the range of U.S. antarctic interests.
- This presence shall include the conduct of scientific activities in major disciplines; year-round occupation of the South Pole and two coastal stations; and availability of related necessary logistics support.
- Every effort shall be made to manage the program in a manner that maximizes cost effectiveness and return on investment.

I have also decided that the National Science Foundation shall continue to:

- budget for and manage the entire United States national program in Antarctica, including logistic support activities so that the program may be managed as a single package;
- fund university research and federal agency programs related to Antarctica;
- draw upon logistic support capabilities of government agencies on a cost reimbursable basis; and
- use commercial support and management facilities where these are determined to be cost effective and will not, in the view of the Group, be detrimental to the national interest.

Other agencies may, however, fund and undertake directed short-term programs of scientific activity related to Antarctica upon the recommendation of the Antarctic Policy Group and subject to the budgetary review process. Such activities shall be coordinated within the framework of the National Science Foundation logistics support.

The expenditures and commitment of resource necessary to maintain an active and influential presence in Antarctica, including the scientific activities and stations in the Antarctic, shall be reviewed and determined as part of the normal budget process. To ensure that the United States Antarctic Program is not funded at the expense of other National Science Foundation programs, the OMB will provide specific budgetary guidance for the antarctic program. *

To ensure that the United States has the necessary flexibility and operational reach in the area, the Departments of Defense and Transportation shall continue to provide, on a reimbursable basis, the logistic support requested by the National Science Foundation and to develop, in collaboration with the Foundation, logistic arrangements and cost structure required for effective and responsive program support at minimum cost.

With respect to the upcoming negotiations on a regime covering antarctic mineral resources, the Antarctic Policy Group shall prepare a detailed U.S. position and instructions. These should be forwarded for my consideration by May 15, 1982.

Ronald Reagan

(C)

**JUSTIFICATION FOR SCORING ANTARCTIC LOGISTICS AND
RELATED CAPITAL FACILITIES AS A DEFENSE (050) EXPENDITURE**

Though there are important scientific reasons to be in the Antarctic, there are also important national security reasons. Much of this nation's ability to carry out an "active and influential presence" is dependent upon the logistic support (i.e. support personnel, equipment, aircraft, flight services, etc.) provided by DOD. In addition, analysis indicates that over the next nine years significant costs (aircraft and helicopter replacement, station rebuilding, correction of past environmental practices, etc.) are going to have to be addressed if this nation is going to continue to maintain its influence and presence in this vital region.

Presidential Memorandum 6646 states, "The expenditure and commitment of resources necessary to maintain an active and influential presence in Antarctica...shall be reviewed and determined as part of the normal budget process. To ensure that the United States Antarctic Program is not funded at the expense of other National Science Foundation programs, the OMB will provide specific budgetary guidance for the antarctic program."

In subsequent Administration reviews of the program, OMB has stated that NSF should receive "...a separate funding allowance, and OMB will continue to ensure that the Program is not conducted at the expense of other NSF scientific programs...Funding tradeoffs between the Antarctic Program and other NSF activities should be avoided in the budget process."

Given the non-defense discretionary funding constraints the VA, HUD, and Independent Agencies Subcommittee will be under to support the space program, the research programs at NSF, and other non-defense programs within the bill, scoring the Antarctic logistics and related activities as a defense expenditure:

- o Would relieve growing budgetary pressure on all domestic science and technology initiatives -- including NASA and DOE's SSC;
- o Would be consistent with the Administration's repeatedly stated intention to protect NSF's research programs by providing "...a separate funding allowance, and...continue to ensure that the Program is not conducted at the expenses of other NSF scientific programs...Funding tradeoffs between the Antarctic program and other NSF activities should be avoided in the budget process."
- o Would be consistent with "scoring" prior to 1971 when separate appropriations were made directly to DOD for logistics support; and
- o Would not violate the Antarctic Treaty or its restrictions on defense activities in Antarctic, Article I of the Treaty states: "...the present Treaty shall not prevent the use of military personnel or equipment for scientific research or for any other peaceful purpose."

U.S. ANTARCTIC PROGRAM
CAPITAL REQUIREMENTS AND DOD REIMBURSEMENT DURING THE 1990'S

ISSUE: Over the next nine years, as much as \$1.3 billion could be needed to support the costs associated with the necessary acquisition of aircraft, helicopters, South Pole Station reconstruction, environmental clean-up activities, and reimbursement to DOD for services and personnel used to support the U.S. Antarctic Program. This program is important for scientific reasons and as an expression of national interest on that continent.

BACKGROUND: In 1970 and 1976 National Security Decision Memoranda 71 and 318, respectively, affirmed and reaffirmed the "importance of maintaining an active and influential presence in the Antarctic" that is "responsive to United States scientific, economic, and political objectives." In February 1982, the President again reaffirmed this policy (Presidential Memorandum 6646) and noted that the presence in Antarctica shall include "year round occupation of the South Pole and two coastal stations."

The U.S. Antarctic Program is the nation's program for research and presence in Antarctica. The National Science Foundation, as affirmed in Presidential Memorandum 6646, has overall funding and management responsibility for the U.S. activities in Antarctica. The Antarctic Policy Group provides policy guidance for U.S. activities in the Antarctic Treaty. The APG's membership consists of the Secretary of State (Chair), the Director of NSF, the Secretary of Defense, and other agencies as appropriate.

The Antarctic Treaty, which governs international conduct in the Antarctic, has 12 original signatory nations -- including the U.K., France, and the USSR; 13 other nations have achieved consultative status, and 14 other nations have acceded to the Treaty and may attend consultative meetings as observers. The treaty provides that Antarctica shall be used for peaceful purposes only; it prohibits military operations except in support of peaceful activities. It provides that freedom of scientific investigation and cooperation shall continue and that nations shall exchange program plans, personnel, observations, and results. The Treaty does not recognize, dispute, or establish territorial claims, and it prohibits assertion of new claims. It prohibits nuclear explosions and disposal of radioactive waste. It guarantees access by any treaty nation to inspect others' stations and equipment.

Scientific investigation of Antarctica began on its present scale with the 1957-58 International Geophysical Year, and, since that time, a continuous research program has been conducted involving many different nations. To carry out the U.S. program, a significant amount of logistical and science support facilities are required. A substantial amount of that support is provided on a reimbursable basis by DOD and the Coast Guard.

CAPITAL REQUIREMENTS AND LOGISTICAL NEEDS

NSF REIMBURSEMENT TO DOD FOR LOGISTICAL SUPPORT: Consistent with Presidential Memorandum 6646, the NSF budgets for and manages the entire U.S. national program in the Antarctic, including logistical support activities so that the program can be managed as a single package. To maintain this country's necessary flexibility and operational reach in the area, the DOD provides, on a reimbursable basis, logistic support as requested by NSF. For the past two years, and projected for the foreseeable future, NSF is allocating \$75 million per year to reimburse the DOD for the logistic support it provides for the Antarctic program. At present these funds go to support:

- Personnel: \$31 million per year
- Air Operations: \$20 million per year
- Surface Transportation: \$3 million per year
- Antarctic Continent Operations: \$7 million per year
- US and New Zealand Operations: \$2 million per year
- Construction and Procurement: \$12 million per year

LC-130 AIRCRAFT: NSF currently holds title to seven LC-130 aircraft operated by the Navy under a memorandum of agreement between NSF and DOD. Of the seven planes, six aircraft are in operation and consist of two "F" models which were built in 1960 and are limited in their cargo capacity, lift capability and have a range of up to 2,300 miles; and four of the more suitable "R" models built in the early 1970's. Two of the older "F" models have been upgraded to provide them with capabilities similar to those of the "R" model. The seventh LC-130 is a 1960 "F" model that was recovered in 1988 from its 1971 crash site in Antarctica. It is currently back in the U.S. undergoing repair.

To meet the objectives of year-round access to Antarctica, increased science support flight hours during the operational season and the increased need for training, future requirements call for up to 9 LC-130 aircraft. To determine long-range aircraft requirements, NSF contracted for a study that identified the LC-130 as the aircraft of choice to perform the bulk of the Antarctic mission. The aircraft are currently the only ski-equipped, heavy-lift U.S. aircraft that can operate at McMurdo Station after the December closing of the sea ice runway.

The Antarctic environment is particularly harsh on the aircraft. The increasing number of open field landings are taxing and put great strain on the LC-130's. Mounting maintenance problems with these aging aircraft are contributing to increasing amounts of down time during the short and critically busy austral summer operations season. Also, three of the seven LC-130's will be at least 35 years old before their replacements can be available.

To meet program missions as well as maintain this Nation's "active and influential presence" a functioning mission capable fleet of LC-130 aircraft is absolutely essential.

The current estimate for a suitably configured aircraft is \$49 million per aircraft. Two have been projected for replacement in FY93 and FY94. The cost of replacing the fleet with up to 9 LC-130 aircraft could require as much as \$425 million.

HELICOPTER REQUIREMENTS: NSF currently uses six UH-1N helicopters operated by the Navy under a memorandum of agreement between NSF and DOD. Operations requiring helicopter support include: passenger movements of scientific field parties, as well as transportation of military and contractor technicians to remote communication and other field facilities requiring construction, maintenance, and upgrades; cargo movements up to a maximum of 2000 pounds; photographic surveys; and airborne surveys using equipment mounted on the helicopter to conduct atmospheric and geophysical studies. In addition to the six UH-1N helicopters, for the first time, the 1990-91 season saw NSF lease two civilian helicopters to enhance field camp support capabilities.

The UH-1N helicopter ("Hueys") have been used in the Antarctic since the early 1970's. These helicopters have become invaluable in supporting science as well as providing other important logistical assistance. During this past season, the helicopters logged approximately 1200 hours of flying time. The age of these helicopters and the heavy annual useage is combining to create a need for major maintenance and service-life extension efforts. In addition, NSF has identified the following short comings with the current UH-1N helicopters: range vs. payload; altitude vs. payload; maintainability; reliability; cargo space; lack of attrition/replacement and additional aircraft; and lack of state-of-the-art navigational aids.

The H-60 helicopter, used by both the Army and Navy, has been identified as a model that would alleviate the identified shortcomings of the UH-1N. Leasing additional civilian helicopters is a possible option at an estimated \$3 million per year. The cost of new, suitably configured H-60 helicopters is estimated to be between \$15 million to \$20 million, depending upon the number procured. A replacement of the current fleet of helicopters could cost between \$120 million and \$160 million.

RECONSTRUCTION OF SOUTH POLE STATION: Americans have occupied south pole continuously since November 1956: the station was rebuilt in 1975 as a geodesic dome that covers modular buildings, fuel bladders, and equipment. From a geopolitical point of view, South Pole station has been pivotal in keeping U.S. options open with regard to the territorial claims of other nations. The U.S. strategy has been a most effective one, with South Pole straddling all converging claims of sovereignty. This strategy is more important than ever in the face of a doubling of Antarctic Treaty consultative (voting) parties and an ever more formidable alignment of non-claimant parties. South Pole Station is key to this nation's "active and influential presence". This presence is particularly important in view of serious challenges in the Antarctic Treaty System related to environmental, mineral, fishing, and tourism issues.

From an operational point of view, South Pole Station has evolved into a vital crossroads of the Antarctic continent. First, it serves to project U.S. presence at the

most important location on the continent. Second, it is an acclimatization center where U.S. personnel can adapt to the high altitude regime before deploying to scientific field camps in the Antarctic interior. Third, South Pole is the communications hub of the continent for stations and aircraft. Fourth, it is indispensable in supporting continent-wide search and rescue (SAR) missions that inevitably fall to the U.S. program because of its unique LC-130 aircraft capability. The demanding missions across thousands of miles of the vast ice sheet would be even more dangerous, or often impossible, without this unique and vital center of operations.

The present South Pole Station, designed for 10 years useable life, has lasted beyond expectations. However, in recent years detailed engineering surveys have pointed up severe structural problems in the dome caused by uneven structural loads from ever-increasing asymmetric snow drifts. In the 1989/90 austral summer, significant resources were expended to effect temporary "fixes" to jack up the base of the dome to remedy severe distortions and replace broken structural members and panels. In this coming decade, a new station at South Pole will be needed. The current estimates for the replacement of South Pole Station range between \$80 million to \$100 million.

ENVIRONMENTAL CLEAN UP REQUIREMENTS: Until 1971, the Navy funded, operated and managed the Antarctic logistics program. In 1971, the National Security Council recommended NSF be named the lead agency for the Antarctic Program and transferred the logistics funding to NSF. This decision has been reaffirmed on several occasions, most recently in a 1983 report prepared by OMB at the request of the Senate Appropriations Committee.

In 1990, NSF began an environmental clean up program in the Antarctic. This effort is necessary to rectify past practices by program participants, including DOD and civilian logistical support activities. Environmental protection in Antarctica involves management of both a research program, but also a wide-ranging network of DOD and civilian support facilities and services. Initial efforts have focused on clarification of legal responsibilities, establishment of environmental assessment procedures, stepped up environmental awareness measures, and appraisal of the waste-management situation at McMurdo.

NSF, with the assistance of a team of environmental specialists from several of the national labs, is in the process of completing an assessment of current solid waste management system at McMurdo. Once the size of the problem is quantified, a new solid waste management strategy will be developed and implemented by the deployment of one or more advanced technological solutions likely to be recommended by the National Lab assessment team. Current estimates indicate that on top of the \$25 million requested in the FY 1992 budget, and dependent upon the environmental technologies employed, up to \$10 to \$15 million per year until 1997 may be needed to rectify environmentally related problems caused, in part, by past practices.

(d)

ANTARCTIC PROGRAM

PARTICIPANTS AND BENEFICIARIES:

AGENCIES RECEIVE NO MONEY FROM NSF/DOD, BUT THEIR PRESENCE IS ENABLED BY DOD LOGISTICAL SUPPORT, WHICH IS NECESSARY TO CONDUCT RESEARCH, FOR INSTANCE IN OZONE DEPLETION.

AGENCY PARTICIPANTS INCLUDE R&D AGENCIES -- U.S. GEOLOGICAL SURVEY, NASA, NOAA, AND EPA. ALL OF THESE HAVE RESEARCHERS IN ANTARCTICA DURING THE SUMMER SEASON.

THE STATE DEPARTMENT BENEFITS FROM U.S. PRESENCE FOR DIPLOMATIC REASONS. IT IS ESSENTIAL TO MAINTAIN U.S. PRESENCE AMONG COMPETING COUNTRIES WITH TERRITORIAL AND OTHER RIGHTS CLAIMS.

NSF FUNDS RESEARCH IN THE ANTARCTIC FOR ITS OWN RESEARCHERS AND PROVIDES THE ENVIRONMENT FOR THEIR WORK FROM THE BUDGET FOR RESEARCH ACTIVITIES = \$71,800 (RESEARCH: \$17K; OPERATIONS: \$32K; CONSTRUCTION/PROCUREMENT: \$22K).

NSF ANTARCTIC LOGISTICAL SUPPORT FOR FY 1990:

LOGISTICAL SUPPORT = \$79,700 (DOD: \$75K; CONTRACTOR: \$5K)

NSF REIMBURSEMENT TO DOD FOR LOGISTICAL SUPPORT:

figures approximate, actuals vary annually

PERSONNEL: \$31 MILLION PER YEAR
AIR OPERATIONS: \$20 MILLION/ YR
SURFACE TRANSPORTATION: \$3 MILLION/ YR
ANTARCTIC CONTINENT OPERATIONS: \$7 MILLION/ YR
US AND NEW ZEALAND OPERATIONS: \$2 MILLION/ YR
CONSTRUCTION AND PROCUREMENT: \$12 MILLION/ YR

DEFENSE DOLLARS ARE REQUESTED FOR ONLY A PORTION OF THE ANTARCTIC PROGRAM, THE PORTION THAT RELATED TO MAINTAINING AND EXERCISING AN ACTIVE AND INFLUENTIAL PRESENCE. THAT PRESENCE IS DEPENDENT ON THE AIRCRAFT AND RELATED SUPPORT SERVICES FOR SCIENCE AS WELL AS FOR NATIONAL SECURITY AND DIPLOMATIC REASONS.

LOCATION OF RESEARCH OPERATIONS ON CONTINENT:

THE LOGISTICS PART OF NSF BUDGET SUPPORTS MAINTENANCE AND OPERATION (PLANES AND PILOTS) FOR SOUTH POLE STATION, OCCUPIED PREDOMINANTLY FOR DIPLOMATIC REASONS: TO MAINTAIN U.S. PRESENCE AT THE CONVERGENCE POINT FOR ALL TERRITORIAL CLAIMS BY NATIONS PARTICIPATING IN ANTARCTIC ACTIVITIES.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
03. Memo	From D. Allan Bromley to John Sununu Re: Presidential Addresses Focussing on Science and Technology (2 pp.)	4/19/91	P 5	

Collection:

Record Group: Bush Presidential Records
Office: Chief of Staff to the President, Office of the
Series: Sununu, John, Files
Subseries: White House Offices File
WHORM Cat.:
File Location: Science & Technology
 (Bromley) (1991) [4]

Open on Expiration of PRA
 (Document Follows)
 By JP (NLGB) on 10/28/05

Date Closed:	12/29/2004	OA/ID Number:	29184-004
FOIA/SYS Case #:	1998-0004-F[2]	Appeal Case #:	
Re-review Case #:	2005-0426-S	Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
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 and his advisors, or between such advisors [(a)(5) of the PRA]
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C. Closed in accordance with restrictions contained in donor's deed of
 gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
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 (b)(7) Release would disclose information compiled for law enforcement
 purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of
 financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

THE WHITE HOUSE
WASHINGTON

AC/ER

April 19, 1991

THE CHIEF of STAFF
has seen

A
MEMORANDUM TO JOHN H. SUNUNU

FROM:

D. ALLAN BROMLEY *Am*

SUBJECT:

PRESIDENTIAL ADDRESSES FOCUSING ON
SCIENCE AND TECHNOLOGY

You asked me to think of some occasions when the President might consider giving major S&T-related talks. Herewith some suggestions:

a) Enclosed is a document entitled "Decade of the Brain: Maximizing Human Potential", that I will release next Wednesday in Boston when I give the keynote address to the American Academy of Neurology annual meeting. Boston fits well because I can pay tribute to Silvio Conte with whom I worked in getting this Decade of the Brain underway. The report, with which I am pleased, was prepared out of my office with much help from the agencies and in response to a Congressional instruction.

I would suggest that this general topic would be appropriate for the President's commencement talk at Princeton. The Decade of the Brain was initiated by the President on July 17, 1990, by formal proclamation and OSTP was charged with leading the activity.

The enclosed document represents our first cut at an inventory of Federal activity and at the requested research plan. (See the foldout at the end of the report.) We have not as yet scoped out the full Decade plan nor have we attempted a detailed budget projection: these will come later this year.

We would be happy to work with Dave Demarest to produce an excellent talk on this topic for the President. It would mark his first major scientific speech in the life sciences and, I believe, would be very well received in Princeton.

b) Turning now to technology, I would like to suggest that the President devote his Michigan commencement talk to high performance computing and communication, i.e., to the information age.

As you recall, HPCC was one of the three major Presidential initiatives in our FY 1992 budget. The program plan was developed by a FCCSET committee and followed on earlier OSTP reports on this topic.

This topic would be particularly appropriate for Michigan because:

- o The University of Michigan through a subsidiary is a major developer and provider of advanced network services;**
- o The State of Michigan has made significant investments in networking and has important demonstration projects;**
- o Michigan has a new Republican Governor.**

This talk would also provide an opportunity for the President to take the entirely appropriate credit for this important initiative. As you know Senator Al Gore is working very hard to take over that credit--with some help from Representative George Brown. Congress is moving rapidly toward legislation on HPCC.

I can report to you that the involved agencies would enthusiastically support this suggestion of a Presidential speech.

I am enclosing the report prepared on the HPCC initiative entitled "The Grand Challenges" and again, we would be delighted to work with Dave Demarest in putting together a talk that, in my opinion, would be very well received in Michigan.

I will be back to you with specific suggestions for the President's Cal Tech talk. Tradition has it that the Cal Tech commencement talk is much lighter and more humorous than those in other universities--but I am sure that the President is entirely free to break with that tradition if he so wishes.

Enclosures

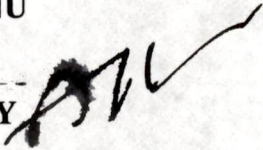
EXECUTIVE OFFICE OF THE PRESIDENT
OFFICE OF SCIENCE AND TECHNOLOGY POLICY
WASHINGTON, D.C. 20506

February 6, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR GOVERNOR SUNUNU

FROM:

D. ALLAN BROMLEY 

 SUBJECT:

HUD PLAN FOR LEAD-BASED PAINT ABATEMENT

The plan addresses a problem of serious proportions whose dimensions have only quite recently become apparent. HUD has done a competent job in defining the problem and in developing a strategy which will require a long-term, continuing investment. A beginning needs to be made in addressing the problem and this is incorporated in the plan. Meanwhile, a number of research projects are required which would provide for alternative, hopefully simpler and less expensive, methods for testing and abatement. This need is recognized.

This initiative has been developed in collaboration with EPA and HHS and is parallel with special initiatives in each of the agencies. Continuing collaboration in program execution will be required and mechanisms are being developed to facilitate this. OSTP plans to follow closely progress in this endeavor.

12/18 - Amy
1/3 - Report sent
2/9 - Amy

THE WHITE HOUSE
WASHINGTON

Date: December 3, 1990

FOR: ALLAN BROMLEY
FROM: GOVERNOR JOHN H. SUNUNU

☐ Action

☒ Your Comment on the attached

☐ Let's Talk

☐ FYI

THE WHITE HOUSE

WASHINGTON

November 20, 1990

THE CHIEF of STAFF
has seen

MEMORANDUM FOR EDE HOLIDAY

FROM: DANIEL CASSE *Dac*

SUBJECT: HUD'S Lead-Based Paint Report

In the next few weeks, the Department of Housing and Urban Development will release its report on lead-based paint, mandated by Congress in 1988. The report surveys the presence of lead-based paint in American homes, assesses the health risks it poses and provides estimates on the cost of abating the problem. On November 6, Cabinet Affairs arranged a briefing by HUD officials for affected agencies and White House offices. What follows is a summary of the report and our discussion at the briefing.

Lead ingested in the system can be highly toxic, poisoning the blood and bones. It is particularly hazardous in children for whom very high blood lead levels can cause mental retardation or death. Because of its hazards, no lead-based house paint has been commercially manufactured in the United States since the 1950s. But paint on older houses remains a source of lead poisoning as does water that runs through lead pipes and industrial emissions of lead.

Today, approximately 200,000 children are estimated to have elevated blood lead levels, and the problem seems particularly concentrated among inner-city, disadvantaged children. That number is based on the current standard of 25 micrograms of lead per decilitre of blood, a standard that has been steadily lowered over the last twenty years as researchers have learned more about the dangers of lead. Next spring, a scientific advisory panel will present recommendations to the Centers for Disease Control on whether the standard should be lowered further to between 10 and 15 micrograms. If that lower standard is adopted -- and at this point no one knows what the advisory committee will determine -- it will effectively increase by ten-fold the number of children considered to have "high" blood lead levels. Under such a standard, approximately 1 in 6 children in metropolitan cities will be assessed as having high blood lead levels.

This new report presents two key findings. First, the risk of lead paint poisoning occurs not only from the direct ingestion of paint chips, as was once thought, but also from paint dust that comes from aging of homes, home renovation, or even worn window sills. This dust is hazardous even when it remains in the air or on soil.

Second, the report estimates that lead-based paint can be found on some parts of approximately 57 million private homes in the United States. These houses are spread throughout the country and are found in neighborhoods at every income level. Of these 57 million, HUD identifies 3.8 million houses that it believes pose the greatest risks: houses with peeling paint or paint dust occupied by families with children under the age of 7.

The report finds that the costs of abating the problem of lead-based paint are very expensive and the benefits are uncertain. In the 3.8 million high priority houses identified by the report, HUD officials estimate the costs to be from \$9,000 (sealing or covering old paint) to \$12,000 (removing paint) per house. But because paint dust can sometimes be created by the process of abatement itself, some abatement methods may actually increase the presence of toxic lead paint material.

HUD officials argue that any assessment of the risks created by lead-based paint has to involve determining whether a particular house actually poses risks to its residents. Currently, the cost of testing a house for lead-based paint is between \$300 - \$400 per unit -- an enormous sum if all high priority houses were to be tested. The report suggests pursuing the chemical research necessary to lower the costs of testing and to make testing a more widely available service.

The other approach to the problem that was discussed at our briefing was screening children for blood lead levels and increasing preventive education about the problem. In FY 1991, HHS devoted \$7.8 million dollars in discretionary grants to states for screening programs in schools and some education programs.

Lead-based paint is not a new problem, and at our briefing there was a mix of views on whether this report will generate the national attention that other domestic environmental problems such as Alar or radon have received. HUD's current strategy is to focus on reducing the costs of abatement and testing, expanding public education and providing a \$100 million loan fund for abatement in high priority homes occupied by low-income families with young children.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
04. Memo	From D. Allan Bromley to John Sununu Re: International Environmental Meetings (1 pp.)	3/29/91	P-5	

Collection:

Record Group: Bush Presidential Records
Office: Chief of Staff to the President, Office of the
Series: Sununu, John, Files
Subseries: White House Offices File
WHORM Cat.:
File Location: Science & Technology
 (Bromley) (1991) [4]

Open on Expiration of PRA
 (Document Follows)
 By JF (NLGB) on 10/28/05

Date Closed:	12/29/2004	OA/ID Number:	29184-004
FOIA/SYS Case #:	1998-0004-F[2]	Appeal Case #:	
Re-review Case #:	2005-0426-S	Appeal Disposition:	
P-2/P-5 Review Case #:		Disposition Date:	
AR Case #:		MR Case #:	
AR Disposition:		MR Disposition:	
AR Disposition Date:		MR Disposition Date:	

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 (b)(9) Release would disclose geological or geophysical information

THE WHITE HOUSE

WASHINGTON

March 29, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: D. ALLAN BROMLEY *Alan*

SUBJECT: International Environmental Meetings

The fifth plenary session of the Intergovernmental Panel on Climate Change (IPCC) was held March 13 to 15. With negotiations on a framework climate change convention currently underway, and a variety of other international environmental meetings on the horizon such as the IPCC and the United Nations Conference on Environment and Development (UNCED), it will be very important to carefully coordinate U.S. activities. This will do much to avoid a potential disconnect in U.S. policies in these different fora.

You will recall that the IPCC is the U.S. endorsed, multinational group considering the science of, impacts from, and possible responses to potential climate changes. By all accounts this latest meeting was a success, both in terms of its beneficial impact on future IPCC meetings and the lack of adverse press coverage. I trust from the latter that you will agree it was handled very well. This is not to understate, however, the problems faced during the meeting's three days.

For example, a group of developing countries attempted to make changes in the structure and organization of the IPCC. The U.S. had retained the chair of the third working group (Response Strategies Working Group, or RSWG), which would have been lost under one of the developing country's proposals. The U.S. delegation, under the able leadership of Bob Reinstein (Deputy Assistant Secretary for Oceans, International Environmental and Scientific Affairs) was able to hold firm on the U.S. position in a non-disruptive fashion. As a result, the U.S. will retain the chair of RSWG and the structure of the IPCC is intact.

I must tell you that I was also very impressed with the hard work Bob Reinstein put in as the U.S. negotiator at the first session on the climate change framework convention. His knowledge about the international environmental issues, his chairmanship of the RSWG, and the trust and credibility he has developed throughout the Administration is a real asset. It certainly would be most helpful if there was some appropriate way for Mr. Reinstein to assist formally in the coordination of preparations for other international meetings, such as the UNCED.

Please do feel free to contact me if you have any further questions on the IPCC or any other climate change issues.

Withdrawal/Redaction Sheet

(George Bush Library)

Document No. and Type	Subject/Title of Document	Date	Restriction	Class.
05. Memo	From D. Allan Bromley to John Sununu Re: Ozone Decrease (2 pp.)	4/8/91	P5	

Collection:

Record Group: Bush Presidential Records
Office: Chief of Staff to the President, Office of the
Series: Sununu, John, Files
Subseries: White House Offices File
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RESTRICTION CODES

Presidential Records Act - [44 U.S.C. 2204(a)]

P-1 National Security Classified Information [(a)(1) of the PRA]
 P-2 Relating to the appointment to Federal office [(a)(2) of the PRA]
 P-3 Release would violate a Federal statute [(a)(3) of the PRA]
 P-4 Release would disclose trade secrets or confidential commercial or financial information [(a)(4) of the PRA]
 P-5 Release would disclose confidential advice between the President and his advisors, or between such advisors [(a)(5) of the PRA]
 P-6 Release would constitute a clearly unwarranted invasion of personal privacy [(a)(6) of the PRA]

C. Closed in accordance with restrictions contained in donor's deed of gift.

PRM. Removed as a personal record misfile.

Freedom of Information Act - [5 U.S.C. 552(b)]

(b)(1) National security classified information [(b)(1) of the FOIA]
 (b)(2) Release would disclose internal personnel rules and practices of an agency [(b)(2) of the FOIA]
 (b)(3) Release would violate a Federal statute [(b)(3) of the FOIA]
 (b)(4) Release would disclose trade secrets or confidential or financial information [(b)(4) of the FOIA]
 (b)(6) Release would constitute a clearly unwarranted invasion of personal privacy [(b)(6) of the FOIA]
 (b)(7) Release would disclose information compiled for law enforcement purposes [(b)(7) of the FOIA]
 (b)(8) Release would disclose information concerning the regulation of financial institutions [(b)(8) of the FOIA]
 (b)(9) Release would disclose geological or geophysical information

THE WHITE HOUSE
WASHINGTON

April 8, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR GOVERNOR SUNUNU

FROM: D. ALLAN BROMLEY

SUBJECT: OZONE DECREASE

I still am unable to provide you with any very clear insight into the EPA's calculations of cancer cases and deaths resulting from decreased ozone in the northern hemisphere. Several points deserve emphasis however.

1. The NASA data are of high quality and while the early analyses of the 1979-1989 satellite data suggested that there was a 2-3% decrease in the total ozone column north of latitude 30 N, from December through March, (as reported in 1989), more complete analyses now give a range of 5-11% for this decrease. In addition, in 1990 in Antarctica, the spring-time depletion equalled previous measurements, but persisted longer and did not disappear until late December.
2. There is no statistically significant decrease, as yet, in the June-October period when most human exposures occurs.
3. From an impact viewpoint the important variable is the UVB flux at the earth's surface. This is not easily deduced from the raw ozone decrease numbers. Cloud cover and aerosol concentration are important variables.
4. EPA's estimates of UVB fluxes and of consequent cancer deaths are based upon models that EPA constructed for use prior to the Montreal Protocol negotiations. The only series of surface-based measurements of the UVB flux (Scotto et al. Science 239 762 (1988)) shows no UVB increases between 1974-1985 in disagreement with the model predictions but the data are limited in scope and may not be entirely reliable.
5. I arranged to be briefed on these models and their use in the current situation and met, this afternoon, with an EPA group.
6. There are a number of outstanding questions.
 - a) What is the conversion factor between ozone decrease and UVB flux at the earth's surface and what are the uncertainties in this factor?

- b) How does human exposure change as a function of time during the year and how does this correlate with the time behavior of the ozone column? What are the uncertainties here?
 - c) What is the conversion factor between UVB exposure and cancer induction (over say a 20 year period)? What are the uncertainties?
 - d) What fraction of the induced cancers lead to death (within 20 years say) and what are the uncertainties?
7. Today the EPA group responsible for Reilly's numbers explained the elements of their models and reported that they had done a Monte Carlo simulation to propagate uncertainties through their calculations. The end result - and it was simply not possible to disentangle all the possible sources of uncertainty actually included - was that the end figures quoted by Reilly have at least a 25% uncertainty. I rather suspect, but cannot prove, that it is larger. I talked to Reilly on Friday after our conversation and, I believe, convinced him either to omit specific numbers or qualify them heavily in future talks or releases.
8. While the decrease in northern hemisphere and Antarctic ozone is clearly a matter of concern and while we clearly should take all reasonable steps to phase out CFC's both here and abroad as soon as possible as well as alert our citizens to the already significant dangers of over exposure to solar UVB, our scientific credibility suffers when senior members of the Administration use numbers that imply greater precision and certainty than is the case.

THE WHITE HOUSE

May 7, 91

Dear John:

Here with the draft letter we discussed. It is in OMB clearance but I would certainly welcome all comments and suggestions.

Sincerely Alan

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Here is the draft letter discussed.

It is in OMB clearance but I would certainly welcome all comments and suggestions.

Alan

THE CHIEF of STAFF
has seen

DRAFT

May 7, 1991

Dear Senator Johnston:

I should like to begin by underscoring the fact that the Administration shares your view that important environmental ramifications of energy sector activities must be considered in the development of energy policies. We would like to continue to work with you on these issues and I welcome the opportunity to share some thoughts on this legislation.

I will limit my discussion in this letter to Section 1003 of the Amendment to S. 341 offered by Senator Wirth because it is this section which sets forth the broad goals and policies of this act. I would like to take this opportunity to provide you with some comments on that section in particular, because, as it is presently written, we would not be able to support the ~~legislation~~ *Amendment*.

From a broad perspective, section 1003 is proposed as a statement of goals for legislation encompassing a wide range of actions on energy issues. However, as presently stated in this section, the goals apply only to climate change. We feel that a comprehensive energy policy must have, at its base, concerns for providing energy at reasonable prices, for reducing dependence on unreliable suppliers, and for providing a safer, healthier environment - including the important issue of possible climate change.

Our main specific concern is that the nearly exclusive focus on carbon dioxide in Section 1003 undercuts established U.S. policy of reliance on an approach to greenhouse issues that considers all greenhouse gases, and their sources and sinks, comprehensively. Any departures from this comprehensive approach, which is widely

recognized to be the most scientifically sound one run the risk of increasing the costs and undermining the effectiveness of greenhouse gas mitigation efforts. For example the exclusion of Montreal Protocol gases under Section 1003(a)(3) appears to rule out consideration of the greenhouse implications of an accelerated phaseout of these gases, or of efforts to bring more countries into the Protocol.

While this Administration strongly supports conclusion of a framework climate convention in June of 1992, we are concerned that Section 1003(a) appears to prejudge the outcome of ongoing negotiations on such a framework climate convention -- possibly undercutting our ability to protect U.S. vital national interests in the negotiating process. The reiteration of this publicly-stated Administration policy regarding conclusion of a framework climate convention by June 1992 in Section 1003(c) is, thus, unnecessary. Moreover, it is important to note that this section should state that the U.S. is working toward an international framework convention on global climate change through the activities of the UN Intergovernmental Negotiating Committee (INC), not through the activities of the Intergovernmental Panel on Climate Change (IPCC). While we also continue to be supportive of the activities of the IPCC, which interacts with and supports the INC, the official negotiating body for the framework convention is the Intergovernmental Negotiating Committee.

Section 1003(b) conspicuously overlooks two policies which we believe must play a crucial role in an environmentally-sound energy policy. Nuclear power is the only available technology which is capable of generating large blocks of electrical power without direct emissions of carbon dioxide, sulfur oxide and nitrogen oxide. Reforestation has the potential to sequester a significant percentage of the nation's carbon dioxide emissions.

DRAFT

The Administration believes that its recently proposed National Energy Strategy is sensitive to the environmental implications of energy policy decisions and reflects the national interest in promoting conservation and efficiency investments that are cost-effective. Full enactment of the NES proposals together with other policies that are already in place, or pending, is projected to stabilize net greenhouse gas emissions at present levels through 2030. We believe that the market-oriented and flexible NES proposals can be successfully implemented and maintained in the face of changing conditions, allowing the country to avoid the painful and costly mistakes of 1970s-type energy policies. We urge the Congress to act on our sound and balanced energy proposals, rather than on alternatives that fail to adequately account for important non-environmental concerns.

I hope that this information is useful to you in your discussions of this very important issue. If there is any way in which we can work further with you to achieve the most successful outcome for the country in this very vital area, please let me know.

With all best wishes.

Sincerely,

D. Allan Bromley
Director

The Honorable J. Bennett Johnston
Chairman
Senate Committee on Energy and Natural Resources
364 Dirksen Senate Building
Washington, D.C. 20510-6150

THE WHITE HOUSE

WASHINGTON

May 9, 1991

THE CHIEF of STAFF
has seen

MEMORANDUM FOR JOHN SUNUNU

FROM: D. ALLAN BROMLEY 
SUBJECT: Newspaper Article on Critical Technologies

I thought you might be interested in the latest newspaper article on the critical technologies issue.

Please call if you have any questions.

INNOVATION / MICHAEL SCHRAGE

Meaningless Lists of 'Critical' Technologies

Drawing inspiration from both Santa Claus and People magazine, the champions of competitiveness are making up lists and checking them twice.

These lists—generated with much fanfare by the good folks at the White House Office of Science and Technology Policy, the Commerce Department and the industry-based Council on Competitiveness, among others—are intended to show which technologies are naughty and nice. In other words, what are the 25 Most Intriguing Technologies? Where is the United States ahead and Japan behind? What is the Sexiest Technology Alive? Inquiring minds want to know.

They'll find no titillating technologies here. The National Critical Technologies Panel (mandated by Congress and appointed by White House Science Adviser D. Alan Bromley), for example, selected no fewer than 22 technologies "deemed critical to the national needs that have been identified." These included software, biotechnology, pollution minimization and remediation, high-definition imaging and displays, ceramics, composites and several other obvious candidates.

Come on! This is techno-pabulum being served up as meaningful analysis. Saying that "software" is a critical technology is precisely like saying that physics is a critical science. It's true, but so what? Does listing software—or biotechnology or composites—as a critical technology give one any sense of how to prioritize research in the area? Does it offer any insights into the commercialization process? Does it send any kind of meaningful message to the investment community about how resources should be best allocated?

Of course not. What we have here is "information" that adds virtually nothing to the debate over the critical issues surrounding America's massive public and private investments in technology. Your tax dollars at work. (Calls to the chairman of the White House panel were not returned.)

By the way, don't think that it's simply a happy coincidence that federal funding for most of these "critical technologies" just happens to have been increased. These lists aren't just obvious; they're also politically correct. There's nothing challenging, counter-intuitive or provocative about them.

"I don't think these lists have any intrinsic merit at all," asserts Michael Odza, a technology transfer consultant and publisher of the Berkeley-based Technology Access Report. "They don't seem to change people's thinking in any way."

"In general, lists force people to give at least some level of priority," says Robert

Costello, an undersecretary of defense in the Reagan Administration who championed using Pentagon procurement policies as a prod to industrial competitiveness. "But, if you don't explicitly link them to an action agenda, they're pretty marginal."

These lists are as marginal as they come. If you wanted to write something important, you wouldn't make a list of the nouns, verbs and adjectives you planned to use; you'd figure out what you really wanted to say. The problem here is that people are focusing on the technologies rather than on the economic, industrial, governmental and scientific processes that create them.

America isn't the undisputed global leader in software because the Defense Advanced Research Projects Agency, IBM and Microsoft sat around in their respective offices coming up with lists of critical systems software and applications to develop. This country dominates the field because it evolved the appropriate infrastructures of hardware, capital, academic research and entrepreneurs that stimulate state-of-the-art innovations.

Technology isn't a product. It's a process—but you'd never know it from scanning these lists.

"We never make up lists," says Michael C. Sekora, who once ran the Pentagon's Project Socrates technology planning support software and is now providing support to American technology firms as president of Florida-based Technology Strategic Planning. "Coming up with a list has no value. Instead of coming up with a list, you need a strategic plan."

Plans don't begin with lists of "critical" technologies, says Sekora; they begin with an objective—"and then you figure out how you're going to effectively utilize worldwide technology to achieve that objective."

It's at that point that you begin to make the hard decisions about what technologies should be internally developed, externally acquired or jointly created with partners. Competitiveness comes from the ability to cost-effectively balance these different technology paths.

Needless to say, the various critical technologies lists barely touch the issue of cost-effectiveness. What price is America prepared to pay to be "competitive" in new materials and biotechnology? Will this price be borne by taxpayers? Or will innovative government policies put industry in a position to cost-effectively compete in global high-tech markets by better leveraging existing resources?

There's no way to know the answers to those questions because they aren't being asked. Instead of thought-provoking ideas, we're getting laundry lists of technological clichés. That's hardly shocking. But clichés do nothing to boost either our awareness or competitiveness. The real debate isn't about which technologies are economically important; it's about how best to manage those technologies to boost the quality of national life.