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B-168033

MAR 17 1970

RELEASED

NASA

Dear Senator Smith:

Enclosed are our answers to the written questions which you gave to members of my staff on February 26, 1970. The questions concern our report to you dated December 31, 1969, on the utilization of consultants by the National Aeronautics and Space Administration (B-168033).

Our review did not provide us with the information needed to reach the conclusions asked for in question 7, and we are unable to provide you with an answer at this time. However, we are continuing our review and, upon its completion, we will answer this question, as well as the other questions you raised during the meetings with members of my staff on February 26 and March 11, 1970.

NASA has not been provided with copies of the enclosure nor has NASA been afforded an opportunity to comment on its contents. We plan to make no further distribution of this material unless copies are specifically requested, and then we shall make distribution only after your agreement has been obtained or public announcement has been made by you concerning the contents of the enclosure.

I hope that our answers to the questions are responsive to your needs.

Sincerely yours,

Comptroller General
of the United States

Enclosure

The Honorable Margaret Chase Smith
United States Senate

~~915/38~~

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SUPPLEMENTAL INFORMATION ON
THE UTILIZATION OF CONSULTANTS
BY THE NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION
B-168033

QUESTION

1. "in a number of cases NASA's employment of consultants did not comply with the applicable Civil Service Commission (CSC) and NASA regulations"
 - A. Specify by name.
 - B. Specify by assignment.
 - C. Specify by private business position.

ANSWER

Question 1 is answered by our responses to questions 3, 4, and 11. This sentence was part of the summary of the information presented in our report, and the details were included in our report on pages 2 to 4 under the side caption "LACK OF COMPLIANCE WITH APPLICABLE REGULATIONS."

QUESTION

2. "procedures for controlling the use of consultants were not fully adequate to preclude payments for unauthorized consultant services and travel expenses"
 - A. Specify inadequacy.
 - B. Specify any particular cases.

ANSWER

A. The inadequacies in the control procedures related to the procedures employed by the Office of the Administrator. These were discussed on pages 4 to 6 of our report and involved:

1. Issuing blanket travel authorizations.
2. Furnishing supplies of Government Transportation Requests to the consultants.
3. Approving of travel vouchers by an official not knowledgeable of the consultants' specific assignments or activities.
4. Maintaining time and attendance records based on information furnished by the consultants and approval of such records by persons not knowledgeable of the consultants' activities.
5. Failing to maintain records of the work performed on a day-to-day basis.

As a result of these procedures, the following deficiencies in control existed. First, the person approving the time and attendance records did not know whether the consultants had actually worked on the days reported, or, if they did work, whether the services had been requested by an authorized NASA official. The time and attendance records are the basis

for the compensation paid to the consultants and, if not correct, unauthorized payments could be made.

Second, the fact that the consultants have the means to travel anywhere within the United States, coupled with the fact that the official approving the travel vouchers is not knowledgeable of the consultants' activities, could result in the payment of unauthorized travel expenses.

Since no formal records were maintained of either the consultants' specific assignments or the work actually performed on a day-to-day basis, the officials approving the time and attendance records and the travel vouchers could not routinely determine whether the payments they were approving had been authorized.

As part of our continuing review, we will determine the extent to which NASA has issued blanket travel authorizations, identify the individuals who have received such authorizations, and ascertain the justification for the issuance and use of the authorizations.

B. We reviewed NASA's records relating to 10 of the consultants assigned to the Office of the Administrator. Their names are:

1. Alexander P. Aven
2. Admiral Walter Frederick Boone, USN (Ret.)
3. General Charles P. Cabell, USAF (Ret.)
4. Frank W. Godsey
5. Mose L. Harvey
6. Richard B. Kirkpatrick
7. Ambassador Joseph C. Satterthwaite
8. General August Schomburg, U. S. Army (Ret.)
9. Stephen B. Sweeney
10. Harold A. Wolff

Our review showed that the following inadequacies were applicable to all the above consultants.

- They were issued blanket travel authorizations covering the period of their employment.
- Their travel vouchers were approved by an official not knowledgeable of the specific assignment or activities.
- NASA maintained its time and attendance records based on information furnished by the consultants, and these records were approved by persons not knowledgeable of the consultants' activities.
- NASA failed to maintain records of the work performed on a day-to-day basis.

Furthermore, the NASA official who normally approved the travel vouchers submitted by the consultants stated that, when appointed, each consultant was given a supply of Government Transportation Requests for obtaining travel accommodations. Although we did not specifically verify that each of the 10 consultants had received a supply of transportation requests, we noted that eight of the 10 consultants had traveled for NASA during calendar year 1968.

The two consultants who did not perform any travel during 1968 were General Schomburg and Admiral Boone.

QUESTIONS

3. "30 consultants--had not submitted statements of employment and financial interests prior to participating in committee meetings"
 - A. Specify by name.
 - B. Specify by assignment.
 - C. Specify by private business position.

4. "20 of these consultants had also been members of advisory committees during fiscal year 1968 without having been properly appointed"
 - A. Specify by name.
 - B. Specify by assignment.
 - C. Specify by private business position.

ANSWER

The names, assignments, and private business positions of the 30 consultants mentioned in question 3 are listed below under the column headed "Fiscal Year 1969," and the 20 consultants mentioned in question 4 are listed under the column headed "Fiscal Year 1968."

We are including a copy of attachment B to NASA Management Instruction (NMI) 1156.1C, which contains a description of the functions and typical areas of technical interest for each of the advisory groups.

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY COUNCIL

- | | |
|--|---------------------|
| 1. Dr. Howard W. Emmons Division of Engineering and Applied Physics Harvard University Pierce Hall Cambridge, Massachusetts 02138 | 1. Same as FY 1968. |
| 2. Mr. Matthias E. Lukens Deputy Director Port of New York Authority New York, New York 10011 | 2. Same as FY 1968. |
| 3. Dr. Allen E. Puckett Executive Vice President Hughes Aircraft Company Culver City, California 90232 | 3. Same as FY 1968. |

RESEARCH AND TECHNOLOGY ADVISORY
COMMITTEE ON AERONAUTICS

- | | |
|--|---------------------|
| 4. Mr. John Stack Vice President-Engineering Fairchild Hiller Corporation Sherman Fairchild Technical Center Fairchild Drive Germantown, Maryland 20767 | 4. Same as FY 1968. |
|--|---------------------|

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON AIRBREATHING PROPULSION

- | | |
|--|---------------------|
| 5. Dr. Heinrich K. Adenstedt Vice President-Engineering Operations Lycoming Division AVCO Corporation 550 South Main Street Stratford, Connecticut 06497 | 5. Same as FY 1968. |
| 6. Mr. Robert E. Fisher Vice President-Research The Marquardt Corporation 16555 Saticoy Street Van Nuys, California 91409 | 6. Same as FY 1968. |
| 7. Dr. George F. Wislicenus Head, Aerospace Engineering Director, Garfield Thomas Water Tunnel Pennsylvania State University Ordnance Research Laboratory P.O. Box 30 State College, Pennsylvania 16801 | 7. Same as FY 1968. |

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON AIRCRAFT OPERATING PROBLEMS

- | |
|--|
| 8. Mr. A. Scott Crossfield Division Vice-President Flight Research and Development Eastern Airlines Miami International Airport Miami, Florida 33148 |
|--|

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY COMMITTEE
ON SPACE VEHICLES

- | | |
|---|---|
| 8. Mr. R. James Gunkel, Director Advance Spacecraft and Launch Systems Advance Systems and Technology Missile and Space Systems Division Space Systems Center McDonnell Douglas Corporation 5301 Bolsa Avenue Huntington Beach, California 92646 | 9. Mr. Gunkel served in FY 1969. His position changed, however, from the Advance Systems and Technology Division to the MOL Subdivision, otherwise the information shown for FY 1968 is applicable also for FY 1969. |
| 9. Mr. Albert J. Kullas, Director Research and Engineering Denver Division Martin Marietta Corporation Mail Number A-112 P.O. Box 179 Denver, Colorado 80201 | 10. Same as FY 1968. |
| 10. Mr. Charles W. Rathke Program Manager Lunar Excursion Module Grumman Aircraft Engineering Corporation Bethpage, New York 11714 | 11. Mr. Rathke served in FY 1969. His position changed, however, from Program Manager to LM Systems Applications Manager, otherwise the information shown for FY 1968 is the same for FY 1969. |

RESEARCH AND TECHNOLOGY ADVISORY COMMITTEE
ON BIOTECHNOLOGY

- | | |
|---|----------------------|
| 11. Dr. Harlow W. Ades Biophysical Research Laboratory Department of Electrical Engineering University of Illinois Urbana, Illinois 61803 | 12. Same as FY 1968. |
|---|----------------------|

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON CONTROL, GUIDANCE AND NAVIGATION

- | | |
|--|--|
| 12. Dr. Arthur E. Bryson Professor of Information and Control Systems 307 Pierce Hall Harvard University Cambridge, Massachusetts 02139 | 13. Dr. Arthur E. Bryson Department of Aeronautics and Astronautics Stanford University Stanford, California 94305 |
| 13. Mr. George B. Litchford President, Litchford Systems 32 Cherry Lawn Lane Northport, New York 11768 | 14. Same as FY 1968. |

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON COMMUNICATIONS AND TRACKING

- | | |
|--|----------------------|
| 14. Dr. Elie J. Baghdady, Director Adcom Incorporated 808 Memorial Drive Cambridge, Massachusetts 02139 | 15. Same as FY 1968. |
|--|----------------------|

RESEARCH AND TECHNOLOGY ADVISORY COMMITTEE
ON BASIC RESEARCH

- | | |
|--|----------------------|
| 15. Dr. Wesley A. Kuhrt Executive Vice President Sikorsky Aircraft Division United Aircraft Corporation Stratford, Connecticut 06497 | 16. Same as FY 1968. |
|--|----------------------|

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON INSTRUMENTATION AND DATA PROCESSING

- | | |
|---|----------------------|
| 16. Dr. Frederick F. Marmo GCA Corporation Bedford, Massachusetts 01731 | 17. Same as FY 1968. |
| 17. Mr. Charles E. White Research and Advance Development Division AVCO Corporation Wilmington, Massachusetts 01887 | 18. Same as FY 1968. |

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON MATERIALS

- | | |
|--|--|
| 18. Dr. G. S. Ansell Professor of Materials Science Rensselaer Polytechnic Institute Troy, New York 12181 | 19. Same as FY 1968. |
| | 20. Mr. John C. Bowman Director of Research Parma Technical Center Carbon Products Division Union Carbide Corporation P.O. Box 6116 Cleveland, Ohio 44101 |
| | 21. Dr. Richard P. Frohberg Manager, Materials Research Rocketdyne Division North American Rockwell Corporation 6633 Canoga Avenue Canoga Park, California 91304 |

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON MATERIALS (continued)

22. Dr. Raymond C. Sangster
Director of Research
Bayside Laboratories
General Telephone/Electronics
Laboratory
208-20 Willets Point Boulevard
Bayside, New York 11360

RESEARCH AND TECHNOLOGY ADVISORY PANEL
ON MATERIALS FOR AIRCRAFT ENGINES

23. Mr. William H. Freeman, Jr.
Metallurgist
Lycoming Division
AVCO Manufacturing Company
505 South Main Street
Stratford, Connecticut 06497
24. Professor Ray W. Guard
Head, Department of
Metallurgical Engineering
Michigan Technical University
Houghton, Michigan 49931
25. Mr. Ira Petker
Technical Specialist
Composite Structures Department
Aerojet General Corporation
Azusa, California 91702

LIST OF CONSULTANTS WHO PROVIDED
SERVICES TO NASA
WITHOUT BEING APPOINTED
FEDERAL EMPLOYEES (continued)

Fiscal Year 1968

Fiscal Year 1969

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON FLUID MECHANICS

26. Dr. Krishnamurty Karamcheti
Professor of Aeronautics and
Astronautics
Department of Aeronautics and
Astronautics
Stanford University
Stanford, California 94305

RESEARCH AND TECHNOLOGY ADVISORY SUBCOMMITTEE
ON ELECTROPHYSICS

- | | |
|---|---|
| <p>19. Dr. Earl Callen Senior Scientist Solid State Division Applied Physics Department Naval Ordnance Laboratory White Oak Silver Spring, Maryland 20910</p> | <p>27. Dr. Earl Callen Department of Physics American University Washington, D.C. 20016</p> |
| <p>20. Dr. K. M. Crowe Professor of Physics University of California Berkeley, California 94720</p> | <p>28. Same as FY 1968.</p> |
| | <p>29. Dr. James E. Mercereau Manager, Cryogenics Science Laboratories Ford Motor Company Newport Beach, California 92660</p> |
| | <p>30. Dr. Norman Rostoker Chairman, Department of Applied Physics Clark Hall Cornell University Ithaca, New York 14850</p> |

NASA RESEARCH AND TECHNOLOGY ADVISORY COUNCIL, COMMITTEES, SUBCOMMITTEES AND PANELS
FUNCTIONS AND TYPICAL AREAS OF TECHNICAL INTEREST

Research and Technology
Advisory Council

Makes recommendations and provides NASA with an integrated technical input on program goals, trends, content, scope, and technical balance in aeronautical and space research and technology
Reviews, integrates, assesses, and balances the technical inputs and recommendations of the Advisory Committees.

Committee on Aeronautics

Reports its recommendations to the Council and provides the Director, Aeronautics Division, with a technical input on program goals, trends, content, scope, and technical balance in aeronautics.
Reviews, integrates, assesses, and balances the technical inputs and recommendations of the Aeronautics Subcommittees.

Subcommittee on Aircraft
Aerodynamics

Reports its recommendations to the Committee on Aeronautics and provides the Chief, Aerodynamics Branch, with technical input in relevant areas of interest including
Aerodynamic and overall flight efficiency of aeronautical vehicles.
Aerodynamic stability and control of aeronautical vehicles.
Aerodynamic heating of aeronautical vehicles.
Aerodynamic flow fields, shock wave generation and propagation, boundary-layer development and transition, shock wave boundary layer interactions, separation, heat transfer and skin friction of aeronautical vehicles.
Aerodynamic problems related to aircraft-propulsion system dynamics, particularly the interaction of inlet-engine-nozzle, and aircraft-engine control systems.
Aerodynamic problems peculiar to the low-speed operation of aeronautical vehicles including those of high-speed aircraft, vertical and short takeoff and landing aircraft (VTOL/STOL), and rotary-wing aircraft.
The need for advanced aerodynamic vehicle ground-based research facilities and evaluation of the technology necessary for their timely construction.
The need for aerodynamic flight research to obtain critical information not otherwise obtainable and to validate or extend the results of ground-based research on aeronautical vehicles.

Subcommittee on Aircraft Operating
Problems

Reports its recommendations to the Committee on Aeronautics and provides the Chief, Operating Environment and System Dynamics Branch, with technical input in relevant areas of interest including
Characteristics and operational effects of atmospheric variables such as composition, electrical and magnetic phenomena, winds, weather, temperature, density, and pressure.
Flight safety and operational factors, such as ditching, thrust reversal, instrumentation, altimetry, pilot procedures and techniques, collisions and operating statistics.
Crew and vehicle protection techniques for efficient operation and survival including escape, restraint, fire, and explosion.
Crew performance problems as imposed by the vehicle and the internal and external environments such as acceleration, thermal stress, noise, vibration, and task saturation.
Boundary-layer and power-plant noise measurements, mechanisms and characteristics, including, generation, propagation, and alleviation.
Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Subcommittee on Aircraft Structures

Reports its recommendations to the Committee on Aeronautics and provides the Chief, Loads and Structures Branch, with technical input in relevant areas of interest including:

Structure environment and design conditions of aircraft, including evaluation of missions and operations, critical ground and flight loads and load distributions, and thermal loads.

Characteristics of aircraft structures, including strength, stiffness, vibration modes and frequencies, thermal resistance, and structural efficiency.

Structural behavior and responses, including failure modes such as fatigue, aerothermoelastic and instability phenomena and forced vibrations.

Safety and reliability as determined by combined effects of environment, structural characteristics and responses.

Problems related to the need for supporting facilities, and an evaluation of the technology necessary for their timely construction.

Panel on Fatigue

Reports its recommendations to the Subcommittee on Aircraft Structures and provides the Chief, Loads and Structures Branch, with technical input in relevant areas of interest including

Research on the mechanism of fatigue, including environmental materials and structural aspects.

Design aspects of fatigue including safe-life, fail-safe considerations and economic limitations of potential design principles.

Design criteria or minimum requirements for ensuring satisfactory probability of structural survival.

Subcommittee on Aircraft Flight Dynamics

Reports its recommendations to the Committee on Aeronautics and provides the Chief, Operating Environment and System Dynamics Branch, with technical input in relevant areas of interest including

Handling qualities of conventional, V/STOL, and rotary-wing aircraft.

Analysis, simulation, and flight test techniques relating to flight dynamics investigations.

Methods of achieving attitude and flight path control for manned aeronautical vehicles.

Dynamic interaction of stability augmentation, artificial feel, flight path command and display systems on aircraft flight dynamics.

Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Subcommittee on Airbreathing Propulsion

Reports its recommendations to the Committee on Aeronautics and provides the Chief, Propulsion Branch, with technical input in relevant areas of interest including

Performance, reliability, durability, safety, and economics of operation of airbreathing propulsion systems for manned and unmanned flight vehicles at subsonic, transonic, supersonic and hypersonic speeds for military and/or commercial applications.

Research on complete engines and engine components, including inlets, fans, compressors, combustors, turbines, augmentors, exhaust nozzles and thrust deflection systems, controls, propellers, power transfer systems, auxiliary power systems, seals, bearings, thrust reversers, and engine noise suppressors.

Aircraft propulsion system dynamics, particularly the interaction of inlet-engine-nozzle and aircraft-engine control systems.

Engine materials, fuels, lubricants, and hydraulic fluids.

Mechanisms of engine noise generation and alleviation techniques.

Problems related to the need for supporting test facilities and an evaluation of the technology necessary for their timely construction.

Committee on Space Vehicles

Reports its recommendations to the Council and provides the Director, Space Vehicle Research and Technology Division, with a technical input on program goals, trends, content, scope, and technical balance in all phases of space flight including launch, operation in space, operation in regions of the moon and planets including to, on, and from their surfaces, reentry flight into the earth's atmosphere, and post-reentry flight within the earth's atmosphere including landing and recovery. The vehicle research and technology programs concern both launch vehicles and spacecraft, and concern primarily the broad technology areas of space environmental factors, structures, and aerodynamics. Some specific technology areas of concern are.

- The meteoroid environment in space and research on meteoroid impact phenomena and concepts of space vehicle design to protect against the meteoroid hazard.
- Fluid slosh dynamics and damping during powered flight, fluid behavior and control in very low gravity space flight environment, and cryogenic containment for both short- and long-term space flight.
- Launch vehicle and spacecraft configuration concepts and performance including static and dynamic stability (lift, drag, moments) and associated structural loads and response.
- Structural dynamics of space vehicle configurations and unsteady aerodynamic forces or pressures including bending and vibrational modes, acoustic pressures, buffeting, flutter, and other aeroelastic phenomena.
- Space radiation effects on space vehicles and radiation shielding.
- Thermal vacuum effects and temperature control of vehicles in space.
- Reentry heating and heat protection systems.
- Launch vehicle base heating and heat protection.
- Flight operation, performance, and structural characteristics of landing and recovery systems including elements such as parachute and impact alleviation devices.
- Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Committee on Chemical Rocket
Propulsion

Reports its recommendations to the Council and provides the Director, Chemical Propulsion Division, with a technical input on program goals, trends, content, scope, and technical balance in all types of chemical rocket propulsion. These include liquid, solid, and hybrid chemical reactants in a wide range of propulsion systems for launch vehicles and spacecraft. Some specific technology areas of concern are.

- Fluid mechanics of propellants from tanks to the combustion chamber.
- Materials, insulation, heat transfer, and cooling.
- Controls including thrust vector control, variable thrust, multiple start and stop, etc.
- Engine components including turbopumps, valves, thrust chambers, motor cases, nozzles, etc.
- Engine systems including control and dynamic responses.
- Gas dynamics during combustion and expansion.
- Ignition and combustion.
- Propellants including properties, manufacturing, handling, and storage, hazards, etc.
- Durability and reliability.
- Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

3

ENCLOSURE
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ATTACHMENT B
NMI 1156.1C

Committee on Space Power &
Electric Propulsion

Reports its recommendations to the Council and provides the Director, Space Power and Electric Propulsion Division, with a technical input on program goals, trends, content, scope, and technical balance in all types of space power systems and electric propulsion systems. Some specific areas of interest are:

- Conversion of solar energy to electrical energy through solar cells, thermionic diodes, or heat cycle engines.
- Conversion of chemical energy to electrical energy through batteries, fuel cells, and heat engines.
- Conversion of nuclear energy to electrical energy by means of nuclear and isotope reactors, thermionic diodes, and heat engines.
- Electric control and distribution systems.
- Complete electric power systems.
- Electric propulsion by plasma, electromagnetic, electrostatic, and thermal techniques.
- Complete electric propulsion systems including electric power components.
- Problems related to the need for supporting facilities and an evaluation of the technology for their timely construction.

Committee on Biotechnology

Reports its recommendations to the Council and provides the Director, Biotechnology and Human Research Division, with a technical input on program goals, trends, content, scope, and technical balance in biotechnology and human factors in aeronautics and space. Specific areas of interest include

- Human research to obtain a better understanding of man and to determine his best utilization in advanced aerospace systems and methods of assessing the status of homeostasis.
- Biotechnology of life support and man-machine information systems including control, and protective systems which guarantee an environment adequate to maintain maximum operating efficiency during advanced aerospace missions.
- Human engineering for man-system integration into the design of advanced aeronautical and space systems, extravehicular technology, and man-machine information systems.
- Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Committee on Electronics

Reports its recommendations to the Council and provides the Director, Electronics and Control Division, with a technical input on the program goals, trends, content, scope, and technical balance in electronics for aeronautics and space including guidance, control, navigation, communication, tracking, instrumentation, and data processing.

Reviews, integrates, assesses, and balances the technical input and recommendations of the Electronics Subcommittees.

Subcommittee on Control, Guidance
and Navigation

Reports its recommendations to the Committee on Electronics and provides the Chiefs, Control and Stability Branch, and Guidance and Navigation Branch, with technical input in relevant areas of interest in aeronautics and space such as

- Techniques and systems for guidance, navigation, and flight path control of manned and unmanned vehicles.
- Techniques and systems for attitude control and stabilization of manned and unmanned flight vehicles.
- Integration of manned and unmanned guidance and control systems with flight vehicles.
- Advanced control and guidance theory and trajectory analysis.
- Components related to control, guidance, and navigation systems.
- Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Subcommittee on Communication and Tracking

Reports its recommendations to the Committee on Electronics and provides the Chief, Communications and Tracking Branch, with technical input in relevant areas of interest in aeronautics and space such as Radio and optical communication and tracking.
Information theory and other disciplines related to communication and tracking.
Optical technology for space applications.
Problems related to the need for supporting facilities and an evaluation of the technology for their timely construction.

Subcommittee on Instrumentation and Data Processing

Reports its recommendations to the Committee on Electronics and provides the Chief, Instrumentation and Data Processing Branch, with technical input in relevant areas of interest in aeronautics and space such as
Instrumentation techniques and devices for detection and measurement of environmental, engineering, and bioelectronic parameters.
Aerospace data processing and computing techniques and devices.
Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Committee on Basic Research

Reports its recommendations to the Council and provides the Director, Research Division, with a technical input on program goals, trends, content, scope, and technical balance in the physical disciplines of fluid physics, electrophysics, materials, and applied mathematics as relevant to the advancement of aeronautics and space projects.
Reviews, integrates, assesses, and balances the technical input and recommendations of the Basic Research Subcommittees.

Subcommittee on Materials

Reports its recommendations to the Committee on Basic Research and provides the Chief, Materials Engineering Branch, with technical input in relevant areas of interest including
Physics of solids, and fundamental metallurgy, chemistry, and ceramics, in support of development of new materials and improved materials for aircraft and spacecraft structures, power plants, electronic and magnetic devices, and auxiliary equipment.
Characterization of structural and power plant materials with emphasis on properties under conditions that will be encountered by aircraft and spacecraft.
Bearings, lubricants, and seals.
Problems related to the need for supporting facilities, and an evaluation of the technology necessary for their timely construction.

Panel on Materials for Aircraft Engines

Reports its recommendations to the Subcommittee on Materials and provides the Chief, Materials Engineering Branch, with technical input in relevant areas of interest including
Definition of requirements of materials for advanced aircraft engines.
Identification of present and future requirements for engine materials that are not satisfied or will not be satisfied by available materials.
Recommendation of research and development that is required to have materials that will meet these requirements.

Subcommittee on Electrophysics

Reports its recommendations to the Committee on Basic Research and provides the Chief, Electrophysics Branch, with technical input in relevant areas of interest including.

Atomic and molecular behavior in pulsed and steady gaseous discharges such as corona, glow, spark and arc, as affected by induced and applied static and dynamic electric and magnetic fields.

The generation, modulation, detection, and amplification of electromagnetic wave energy in the range from gamma rays to the millimeter wave-lengths by stimulated emission and the propagation of such electromagnetic waves through liquids, solids, and gases.

The behavior of charged and uncharged particles due to internal and external static and dynamic electric and magnetic fields, nuclear fields, and other short- and long-range force fields.

Theoretical physics research concerned with electrodynamics, gravity and relativity, wave coherence, magnetism and superconductivity, nuclear fields, and structure and other topics in classical and quantum physics.

Problems related to the need for supporting facilities and an evaluation of the technology necessary for their timely construction.

Subcommittee on Fluid Mechanics

Reports its recommendations to the Committee on Basic Research and provides the Chief, Fluid Dynamics Branch, with technical input in relevant areas of interest including

Composition, properties and chemical kinetics of fluids, including atmospheric gases, combustion products, and propellant fluids in the liquid and gas phase.

Magnetogasdynamics requiring research which involves the flow of electrically conducting fluids under the influence of electric and magnetic fields. Also, research in plasma physics, including the generation, the dynamics, and the diagnostics of plasmas.

Flow of gases at high energies and Mach numbers corresponding to entry into the atmospheres of earth and other planets including the study of physical processes, chemical reactions, flow configurations, radiative heating, and highly rarefied gases.

Boundary layer phenomena, including transition from laminar to turbulent flow, skin friction, mass transfer, and heat transfer, interaction of boundary layer with shock waves and separated flows.

Internal fluid mechanics including two-phase flow, flow of cryogenic and non-Newtonian fluids, Study of real gas nozzle flows, detonation, and combustion processes.

Problems related to the need for supporting facilities, and an evaluation of the technology necessary for their timely construction.

QUESTION

5. "14 advisory committees involved had an executive secretary whose responsibilities included providing the personnel office with the data needed to appoint the nongovernmental members of the committee as Federal employees"
- A. Did they so do?
 - B. If not, why not?
 - C. Specify executive secretaries by name.

ANSWER

A and B. During our review, personnel officials advised us that the executive secretaries were responsible for providing the personnel office with the data required to appoint the consultants. Since then, we have discussed with the executive secretaries of five committees their understanding of their responsibilities for appointment of nongovernmental members of the committees as Federal employees. Of the 30 consultants serving without appointment, 15 were on these five committees.

Each of the executive secretaries advised us that he had assigned to his secretary the task of furnishing the personnel office with the data required to appoint the consultants. Only three of the secretaries were in their current positions during fiscal years 1968 and 1969. Each of these three secretaries told us that she was responsible for submitting to the personnel office only a form requesting that an individual be appointed as a consultant and a form outlining the individual's duties and qualifications. Each secretary told us also that, in her opinion, the personnel office was responsible for obtaining the remaining forms--application for employment, statement of employment and financial interests, waiver of compensation, appointment affidavit, and declaration of appointee.

Our review of the records of the five executive secretaries and of documentation obtained from the personnel office indicated that the personnel office had received the forms which the three secretaries said they were responsible for. In addition, instructions provided to the executive secretaries by the Office of Advanced Research and Technology (OART) in August and September 1967 showed that the personnel office was to obtain the remaining forms.

The personnel official who provided personnel support to OART at the time the instructions were written confirmed that he was responsible for obtaining the other data from the consultants but stated that OART often assisted in this process.

The personnel official who had provided personnel support to OART subsequent to January 1969 informed us that the executive secretaries had been advised, at a meeting held in March or April 1969, that they would be responsible for obtaining all the data necessary to appoint the committee members in fiscal year 1970.

C.

14 ADVISORY COMMITTEE EXECUTIVE SECRETARIES

1. Research and Technology Advisory Council
FY 1968--Mr. John L. Sloop
Assistant Associate Administrator for Advanced Research
and Technology

FY 1969--Same.
2. Research and Technology Advisory Committee on Aeronautics
FY 1968--Mr. George N. Chatham
Chief, Program Analysis Branch
Programs and Resources Division

FY 1969--Mr. George N. Chatham
Chief, Advanced Planning Branch
Programs and Resources Division
3. Research and Technology Advisory Subcommittee on Airbreathing
Propulsion
FY 1968--Mr. Nelson F. Rekos
Chief, Propulsion Branch
Aeronautical Vehicles Division

FY 1969--Same.
4. Research and Technology Advisory Subcommittee on Aircraft Operating
Problems
FY 1968--Mr. John H. Enders
Operating Environment and System Dynamics Branch
Aeronautical Vehicles Division

FY 1969--Same.
5. Research and Technology Advisory Committee on Space Vehicles
FY 1968--Mr. Ralph W. May
Chief, Environmental Factors and Aerodynamics Program
Space Vehicles Division

FY 1969--Same.

14 ADVISORY COMMITTEE EXECUTIVE SECRETARIES (continued)

6. Research and Technology Advisory Committee on Biotechnology

FY 1968--Dr. Leo Fox
Chief, Human Research Branch
Biotechnology and Human Research Division

FY 1969--Dr. Leo Fox
Deputy Director
Biotechnology and Human Research Division

7. Research and Technology Advisory Subcommittee on Control, Guidance and Navigation

FY 1968--Mr. Charles H. Gould
Chief, Control and Stabilization Branch
Electronics and Control Division

FY 1969--Mr. Carl Janow
Guidance and Control Branch
Electronics and Control Division

8. Research and Technology Advisory Subcommittee on Communications and Tracking

FY 1968--Mr. Henry L. Anderton
Chief, Communications and Tracking Branch
Electronics and Control Division

FY 1969--Mr. Orville J. Stanton
Microwave and Optics Branch
Electronics and Control Division

9. Research and Technology Advisory Subcommittee on Instrumentation and Data Processing

FY 1968--Mr. Gene A. Vacca
Chief, Instrumentation and Data Processing Branch
Electronics and Control Division

FY 1969--Mr. John L. East
Instrumentation and Data Processing Branch
Electronics and Control Division

14 ADVISORY COMMITTEE EXECUTIVE SECRETARIES (continued)

10. Research and Technology Advisory Committee on Basic Research
FY 1968--Mr. Werner C. Steinle
Technical Assistant
Research Division

FY 1969--Same.
11. Research and Technology Advisory Subcommittee on Materials
FY 1968--Mr. Joseph Maltz
Materials Engineering Branch
Research Division

FY 1969--Same.
12. Research and Technology Advisory Panel on Materials for Aircraft Engines
FY 1968--Mr. Richard H. Raring
Materials Engineering Branch
Research Division

FY 1969--Same.
13. Research and Technology Advisory Subcommittee on Fluid Mechanics
FY 1968--Mr. Ira R. Schwartz
Fluid Dynamics Branch
Research Division

FY 1969--Same.
14. Research and Technology Advisory Subcommittee on Electrophysics
FY 1968--Mr. Herbert W. Talkin
Electrophysics Branch
Research Division

FY 1969--Same.

QUESTION

6. "the personnel office...was responsible for notifying an official in OART when the appointments of committee members had been made and also for obtaining from the committee members the statements of employment and financial interests"

- A. Did they so do?
- B. If not, why not?
- C. Specify responsible persons by title and name.

ANSWER

A and B. The 30 consultants identified by us as having improperly served on 14 advisory committees were never officially appointed Federal employees. Consequently no notification of appointment was furnished to the Office of Advanced Research and Technology NASA Headquarters personnel officials attribute the failure to appoint the consultants to a failure on the part of the executive secretaries to supply the required data. We were advised by personnel officials that, after a number of attempts had been made to obtain the necessary data from the executive secretaries, the incomplete data was returned to the executive secretaries. (See answer to question 5.)

We asked an official in the personnel office whether the consultants who had not been appointed had submitted statements of employment and financial interests. We were informed that there were no statements of employment and financial interests on file for the 30 consultants for any year prior to fiscal year 1970.

C.

Tenure of office
From To

OFFICE OF ORGANIZATION AND MANAGEMENT:

ASSOCIATE ADMINISTRATOR:

| | | |
|-------------------------|-----------|----------|
| Bernard Moritz (acting) | May 1969 | Present |
| Harold B. Finger | Mar. 1967 | May 1969 |

HEADQUARTERS PERSONNEL DIVISION

DIRECTOR:

| | | |
|--------------------------|-----------|-----------|
| Owen P. Gallagher | July 1968 | Present |
| Gwynne R. Berry (acting) | Feb. 1968 | July 1968 |
| Philip H. Sload | July 1960 | Feb. 1968 |

OPERATIONS BRANCH CHIEF:

| | | |
|--------------------|------------|------------|
| Dorothy S. Faltsek | June 1968 | Present |
| Ruby Giddings | Sept. 1967 | June 1968 |
| George Flaherty | Mar. 1967 | Sept. 1967 |

FUNCTIONAL MANAGEMENT

SUPPORT - PERSONNEL:

| | | |
|---------------------|-----------|-----------|
| Richard J. Gillen | Jan. 1969 | Present |
| Furman H. Layman | May 1968 | Dec. 1968 |
| Justin L. Logsdon | Jan. 1968 | May 1968 |
| Anthony R. Cannetti | Feb. 1967 | Jan. 1968 |

QUESTION

7. "there appears to have been a lack of communication between the office utilizing the services of the consultants and the Headquarters personnel office"
- A. Be more specific on this.
 - B. Are both to blame?
 - C. Is either to blame?
 - D. Who has supervisory authority over each?

ANSWER

Our review did not provide the information needed to reach the conclusions asked for, and we are unable to provide you an answer at this time. However, we are continuing our review and will provide the answer to this question when the review is completed.

QUESTION

8. "As the 30 consultants were never officially appointed"
- A. How could they legally be paid if not officially appointed?

ANSWER:

The 30 consultants identified during our review as having improperly served on advisory committees received no compensation for their services.

In a number of cases, the consultants were reimbursed for travel expenses incurred in connection with committee meetings. The law (5 U.S.C. 5703(c)), however, does not require the formal appointment of an individual in the Government service as a condition precedent to the payment of transportation expenses and per diem allowances. Therefore the fact that the 30 consultants were not formally appointed does not invalidate payments to them for travel performed in the interest of the United States.

QUESTION

9. "apparently no attempt was made to obtain the statements required by the conflict of interest regulations"

A. What explanation was given for no attempt?

ANSWER

This statement was our conclusion based upon our understanding of the procedures that were in effect in fiscal years 1968 and 1969 as related to us by personnel officials. (See p. 3 of our report dated December 31, 1969.) We felt that it was most unlikely that any attempt would have been made to obtain the statements required by the conflict-of-interest regulations until all the documents needed to appoint the consultants had been received by the personnel office. Since these 30 consultants were never officially appointed and since personnel officials confirmed that the conflict-of-interest statements had not been received, we did not believe that it was necessary to request an explanation as to why no attempt had been made to obtain the required statements. (See answer to question 6.)

On the basis of the additional information we have obtained to date (see answer to question 5), it appears that our understanding of the appointment procedures may have been in error. Accordingly, we plan to inquire further into the assignment of responsibilities for appointing consultants.

QUESTION

10. "Although the remainder had not been appointed as of December 11, 1969"
- A. Are any now not appointed?
 - B. If so, how many?
 - C. If so, why not?
 - D. If so, identify by name, assignment and private business position.

ANSWER

- A. Yes.
- B. One.
- C. Not all the necessary forms required to appoint the individual as a Federal employee had been received by the personnel office. On February 3, 1970, the Headquarters personnel office notified the Office of Advanced Research and Technology (OART) that the individual had not yet been appointed and that action to appoint this individual was necessary if he was to serve in fiscal year 1970. On February 18, 1970, OART advised the Headquarters personnel office that OART wished to use the individual's services and was awaiting receipt of the necessary papers from him. The required forms had not been forwarded to the Headquarters personnel office by March 11, 1970.

The first meeting of the advisory committee on which this individual serves is scheduled for April 1970.

- D. Dr. K. M. Crowe, Professor of Physics, University of California at Berkeley, is serving in fiscal year 1970 as a member of the Research and Technology Advisory Subcommittee on Electrophysics without having been officially appointed as a Federal employee.

QUESTION

11. "One consultant had worked more than 130 days in each of two consecutive service years. In our opinion, this is prima facie evidence that his employment during the second service year was for temporary service, which, according to law, may not be continued for more than one year"
- A. Specify the consultant by name, assignment and private business position.
- B. Has any consideration been given to take legal action in this case?

ANSWER

A. The name of the consultant is Mr. Harold A. Wolff. At the time of his employment by NASA, Mr. Wolff was the head of Business Communications, Inc., and of Harold Wolff and Associates. During his term of employment, he served as consultant to the NASA Administrator on the management of large, complex organizations. Mr. Wolff's employment by NASA was terminated on May 31, 1969.

B. Mr. Wolff, whose appointment was for intermittent service, actually served more than 130 days--the limit for intermittent service--in 2 consecutive service years, as follows

| <u>Service year</u> | <u>Number of days employed</u> |
|---------------------|--------------------------------|
| 6-1-66 to 5-31-67 | 140 |
| 6-1-67 to 5-31-68 | 135 |
| 6-1-68 to 5-31-69 | 120 |

In our earlier report to you, we expressed the opinion that Mr. Wolff's appointment should have been terminated no later than upon his having worked 130 days in the second service year. As shown above, Mr. Wolff actually worked 5 days beyond that point. For those 5 days he received compensation

of \$500 (\$100 a day) and reimbursement for travel expenses of \$168.56. The time and attendance records maintained by NASA show that Mr. Wolff worked from 10 to 13 hours on each of the 5 days.

Since Mr. Wolff's employment during the 5 days was not authorized, he is to be regarded as having served as an employee in a de facto status. The rule is well established that a person may retain any payments of compensation and allowances (including those for travel) made to him while serving in a de facto status. In our opinion there is, therefore, no legal basis to require Mr. Wolff to refund the amounts paid to him for services rendered during the period in question.

Mr. Wolff also served 120 days on an intermittent basis during the period June 1, 1968, to May 31, 1969. In our opinion the law does not prohibit the reappointment of a consultant on an intermittent basis and thus there is no legal objection to Mr. Wolff's service during that period.

As part of our continuing review work, we will identify the NASA official responsible for having continued Mr. Wolff's employment beyond that period permitted by law and will determine whether legal action should be taken against any NASA official.

QUESTION

12. "We reviewed the records of 10 consultants assigned to OA--from the list of 23 consultants on whom you requested detailed information"
- A. Specify the 10 consultants.
- B. What was the basis for the decision not to review the records of the other 13 consultants?

ANSWER

A. From the list of 23 consultants on whom you had requested information from NASA, we reviewed the records of the following 10 consultants assigned to the Office of the Administrator.

1. Alexander P. Aven
2. Admiral Walter Frederick Boone, USN (Ret.)
3. General Charles P. Cabell, USAF (Ret.)
4. Frank W. Godsey
5. Mose L. Harvey
6. Richard B. Kirkpatrick
7. Ambassador Joseph C. Satterthwaite
8. General August Schomburg, U.S. Army (Ret.)
9. Stephen B. Sweeney
10. Harold A. Wolff

B. During our review it became apparent that we would be unable to review the records relating to all 23 consultants and still meet the reporting deadline of December 31, 1969, mutually established by our staff and Mr. William Parker of the staff of the Senate Committee on Aeronautical and Space Sciences. Since our review showed that there was a general paucity of records relating to the actual work performed by the consultants, we determined that we would be unable to reach any conclusion other than that the controls over the payments made to the consultants for compensation and travel expenses were weak. (See answer to question 2.)

As agreed to with Mr. Parker, we limited our review to a detailed examination of the travel and payroll records of the 10 consultants listed above. The 10 consultants were selected primarily on the basis of the number of questions that had been raised about each by your staff, as reflected in the material provided to us by Mr. Parker.

QUESTION

13. "Although we requested statistics from NASA showing the number of active and inactive consultants during the 9-month period ending September 30, 1969, this information had not been made available to us at the time this report was finalized."

- A. Has it since been made available?
- B. If so, what does it show?
- C. If not, why not?

ANSWER

NASA was requested to provide the data on active and inactive consultants only if it could be furnished by the deadline established by us. This deadline was necessary to ensure that our report on consultants would be issued by December 31, 1969, the date agreed to by your representative and by our staff. NASA never provided us with the data.

We have not determined why NASA was not able to meet the deadline. NASA advised us at the time the information was requested, however, that the computerized Personnel Management Information System could not provide the data without being reprogrammed. We assume that NASA's failure to provide the data was due to this problem.

We had requested the data on the number of active consultants, as well as other data, in order to provide you with as much information as possible on NASA's use of consultants during the first 9 months of calendar year 1969. With the information which we were able to obtain, we established, in our earlier report, that.

1. The number of consultants on the NASA employment rolls had increased from 475 on December 31, 1968, to 504 on September 30, 1969, although copies of correspondence between you and NASA indicated that you had been advised in April 1969 that the number of consultants employed by NASA would be reduced by two thirds.
2. The compensation to be paid to consultants and the man-years of effort to be expended by consultants was expected to increase during fiscal year 1970.

The data that we were unable to obtain was expected to show, for the 9-month period, (1) the total number of consultants that NASA had appointed and (2) how many of those appointed had served 1 day or more. We made no effort, however, to obtain the additional data after issuing our report, since the data that we were able to obtain adequately showed the increased use of consultants during the 9-month period.

As part of our continuing review, we will obtain data on the total number of active and inactive consultants employed by NASA during calendar year 1969.