

SUMMARY REPORT
OF THE
NASA MANAGEMENT STUDY GROUP
RECOMMENDATIONS TO THE
ADMINISTRATOR
NATIONAL AERONAUTICS
AND SPACE ADMINISTRATION

DECEMBER 30, 1986

S. C. PHILLIPS

NASA MANAGEMENT STUDY GROUP

December 30, 1986

Dr. James C. Fletcher
Administrator
National Aeronautics and
Space Administration
Washington, D.C. 20546

Dear Jim:

I am pleased to submit herewith a summary report of the recommendations of the NASA Management Study Group (NMSG). This completes my action on your several assignments to me to assess the management practices and organization of NASA and to recommend changes to improve effectiveness.

As you know, I and other members of the NMSG have reported our findings and recommendations to you and other senior executives at NASA in oral briefings on several occasions during the course of the study. Our final report was presented in the oral briefing to you and Deputy Administrator Dale Myers on December 16, 1986.

I wish to acknowledge with thanks the outstanding support I have received from the able and experienced members of the NMSG and from the distinguished members of the Advisory Panel of the National Academy of Public Administration (NAPA).

We have also been most fortunate in having the whole-hearted cooperation of NASA officials in all offices and centers who have provided detailed information and frankly discussed with us their views on the challenges faced by the management of NASA. Finally let me acknowledge the able staff assistance provided by NAPA which greatly facilitated our work.

It is my hope that you and NASA will find our recommendations helpful in setting the course for future management of the Agency.

Sincerely yours,


Samuel C. Phillips

cc: Mr. Ray Kline
President, NAPA

SUMMARY REPORT OF THE NASA MANAGEMENT STUDY GROUP RECOMMENDATIONS

December 30, 1986

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SUMMARY REPORT OF THE NASA MANAGEMENT STUDY GROUP RECOMMENDATIONS

December 30, 1986

I. INTRODUCTION

The NASA Management Study Group (NMSG) was established under the auspices of the National Academy of Public Administration at the request of the Administrator of NASA to assess NASA's Management practices and to evaluate the effectiveness of the NASA organization. The NMSG addressed first the organization and management of the space station program, then the restructuring of the space shuttle program, and finally NASA's overall organization and management.

Recommendations of the NMSG on the space station program were made in the form of oral briefings to the Administrator and other officials of NASA on June 26, 1986, and have subsequently been largely implemented. With respect to the space shuttle program the NMSG contributed to and reviewed the study led by Astronaut Robert Crippen and participated in the discussions that led to the Administrator's decisions announced on November 5, 1986, with which the NMSG has concurred.

This report summarizes the conclusions and recommendations of the NMSG on the overall management and organization of NASA. Detailed findings and draft recommendations were presented and discussed on several occasions during the course of the study in oral briefings to the Administrator and to the Advisory Panel of the National Academy of Public Administration. A presentation was made to the entire team of NASA top headquarters officials and center directors at an all day meeting on November 25, 1986. A final report, in the form of a revised oral briefing taking account of the comments of the Advisory Panel and the NASA officials after the November 25 meeting, was presented to the Administrator and Deputy Administrator on December 16, 1986.

II. GENERAL OBSERVATIONS

The NMSG study has concentrated on identifying issues in need of special attention by NASA management at this time. As a result, our recommendations focus on areas where changes or improvement may be required.

We must emphasize, at the outset, therefore, that a principal finding of our study is that NASA is fundamentally a sound institution, with many outstanding people with strong dedication to the success of NASA and its programs. We also recognize that many positive steps have been taken in recent months to strengthen the organization, management, and practices of NASA, and that some NMSG recommendations were adopted during the course of our study. The conclusions and recommendations set forth below should be viewed in this context.

The NMSG recognizes that NASA management is conditioned to a significant degree by factors in the external environment over which NASA has only limited control. NASA must conform to Administration policies, budgetary restrictions, Congressional guidance, and the increasingly complex web of legal and regulatory constraints affecting procurement, personnel, and other areas. As a result of the Challenger accident, NASA faces increased critical scrutiny by Congress and the media, a long hiatus in space flights, and some unrealistic public expectations of risk-free space flight. On the other hand, NASA and its program have the President's personal interest and support, and there is, we believe, strong public and Congressional support as well.

In this situation, NASA has the challenge of coping with its external environment and managing its affairs in a way that earns the respect and continued support of the Administration, Congress, and the public. To reestablish NASA's leadership

position in space and aeronautics, management excellence is as essential as technical excellence. Our recommendations are intended as suggestions to help NASA achieve the level of excellence it must have.

III. PRINCIPAL RECOMMENDATIONS

The principal recommendations of the NMSG can be summarized as follows:

1. Establish strong headquarters program direction for each major NASA program, with clear assignment of responsibilities to the NASA centers involved.
2. Improve the discipline and responsiveness to problems of the program management system.
3. Place shuttle and space station programs under a single Associate Administrator when the Administrator is satisfied that recovery of the shuttle will not thereby be compromised.
4. Increase management emphasis on space flight operations.
5. Place special management emphasis on establishing NASA world-class leadership in advanced technology in selected areas of both space and aeronautical technology.
6. Establish a formal planning process within NASA to enunciate long-range goals and lay out program, institutional, and financial plans for meeting them.
7. Strengthen agency-wide leadership in developing and managing people, facilities, equipment, and other institutional resources.

8. Improve management of NASA's external relations.
9. Strengthen the Office of the Administrator and ease the workload of the Administrator and Deputy Administrator.

These and other NMSG recommendations are discussed briefly in the following sections for each of the areas covered by the NMSG study.

IV. PROGRAM MANAGEMENT

Effective management of its technical program is NASA's central task. Five of the principal NMSG recommendations and many subsidiary recommendations are in this area.

1. Establish strong headquarters program direction for each major NASA program, with clear assignment of responsibilities to the NASA center involved.
 - a. Large multi-center spaceflight programs should be managed by a strong program director at headquarters supported by a competent program office in the Washington area. The functions of the headquarters program office should include systems engineering (a support contractor may be needed); program planning and control; management of operations and interfaces with users; safety, reliability, and quality assurance; and other functions as appropriate. Program managers at each center should have clearly defined responsibilities and accountability to the headquarters program director. The NMSG has concurred in the actions now being taken to structure the shuttle and space station programs in this way. The NMSG also believes that the Technical Management Information System (TMIS) proposed for the space station program should be initiated but should be subject to periodic

review by non-advocates and outside experts to ensure that the expected utility is being achieved.

- b. Single center spaceflight programs or projects should also have a program director at headquarters with the overall program control functions of establishing requirements, reviewing progress, and approving changes as necessary. A central program control staff at the Program AA level could support the directors of several smaller programs. The program or project manager at the center should be responsible for planning and implementing the program (including systems engineering), for keeping the program director regularly informed of status and problems, and for requesting his approval of major changes that may be necessary.
- c. NASA should avoid organizing major programs so that large tasks are assigned to more than one center unless technical demands or the scale of the program clearly require substantial contributions from more than one center.
- d. A highly qualified independent office of safety, reliability, and quality assurance is an essential requirement for assuring safety and success in NASA programs. The NMSG has reviewed the goals, organization, priorities, and general plans of the new office recently established in NASA and agrees with the actions already taken and now planned.
- e. NASA headquarters and each center should assess their procurement practices to seek to minimize the long lead times in placing contracts and to assure that proper emphasis is placed on contract structure, contractor selection, and contract administration.

2. Improve the discipline and responsiveness of the program management system.

- a. Reinstitute the former system of Program Approval Documents (PADS) as the basic agreement between the Administrator and the Program Associate Administrator responsible for the program. The PAD should contain the official statement of the program objectives and scope, how the program is to be performed, the responsibilities of the participating organizations, the total resources required (dollars, people, facilities and support from other organizations), and cost and schedule baselines against which progress can be measured. Program control documents at successive lower levels of management should be integrated into a system consistent with and supporting the PADS.
- b. Revitalize regular status reviews at each successive level of management at which progress is measured against the approved baselines, current and potential problems are fully discussed and actions assigned. The Administrator or Deputy Administrator should conduct periodic reviews of all major NASA programs.
- c. Strengthen the agency's independent cost estimating and program assessment capabilities at headquarters and at the centers.

3. Place shuttle and space station programs under a single Associate Administrator when the Administrator is satisfied that recovery of the shuttle will not thereby be compromised. Although now in very different stages of development, the shuttle and space station programs are highly interdependent. Management of the two programs should be unified to ensure proper attention to compatibility of space station design and operational planning with the shuttle and its capabilities,

operational availability, and requirements for logistic support. Nevertheless, the programs should not be combined until it is clear that the NASA's top priority task of returning the shuttle to flight status will not thereby be adversely affected. Until the programs are combined under one AA, the offices of Space Station and Space Flight should jointly prepare plans for the Administrator's approval which clearly define their responsibilities and relationships.

4. Increase management emphasis on spaceflight operations. NASA must accept that it will be responsible for spaceflight operations for the foreseeable future - shuttle, space station, man-tended and free-flying spacecraft, deep space probes, etc. The present structure of organization and management does not assure adequate attention to operations requirements in system design or in the planning and conduct of operations and logistic support in the era of frequent shuttle flights and long-term operation of the space station. A better delineation between development and operations activities is needed even before the shuttle or space station become operational. It is also important that steps be taken to accommodate users more efficiently without compromising safety. At the same time, the shuttle recovery program must not be placed at risk. Therefore, NASA should:
- a. Strengthen management of operations in the space shuttle program at headquarters and the NASA centers. Steps to do this are now underway.
 - b. Ensure responsiveness to operational and user requirements in the design and development of the space station. The Offices of Space Station (OSS), Space Science and Applications, and Aeronautics and Space Technology should jointly prepare plans for the Administrator's approval which clearly define their responsibilities and relationships. OSS should ensure

that its organization and procedures provide adequate linkages with all major user constituencies.

- c. Establish a new Associate Administrator for Operations to develop a comprehensive plan for managing NASA spaceflight operations, to be implemented when shuttle recovery is complete. Initial priority should be given to planning for the future management of manned, man-tended, and related operations. The present Offices of Space Tracking and Data Systems should become a division in the new Office of Spaceflight Operations. The NMSG anticipates that at some point in the future, the Kennedy Space Center would also be placed under the Office of Spaceflight Operations.
5. Place special management emphasis on establishing NASA world-class leadership in advanced technology in selected areas of both space and aeronautical technology. The NMSG believes that NASA's efforts to develop advanced technologies beyond the requirements of current spaceflight programs, on which the U.S. future in space and aeronautics will depend, need more emphasis and a clearer sense of direction. Specifically, NASA should:
- a. Strengthen capabilities for advanced research and technology development at all NASA centers.
 - b. Limit spaceflight program management activities at NASA OAST research centers. This should permit a stronger focus on advanced research and technology.
 - c. Seek to establish stronger linkages between the NASA research centers and industry in space technology, comparable to those that now exist in aeronautics.

V. PLANNING

6. Establish a formal planning process within NASA to enunciate long-range goals and lay out program, institutional, and financial plans for meeting them. NMSG believes that a formal iterative planning process that involves direct participation of the entire NASA line organization at headquarters and the centers would materially assist NASA by giving a clearer sense of direction and better focus to its programs.
 - a. A biennial planning process should be instituted to develop detailed program, institutional, and financial plans for the next five years and skeletal plans for the ten years beyond.
 - b. The plans should be developed by the line organization, based on goals and guidelines enunciated by the Administrator after taking account of the views and recommendations of the NASA program offices, congressional reports, scientific and other advisory groups, and other constituencies.
 - c. The present Strategic Planning Council should be retained and its role broadened to include an annual evaluation of progress against plans.
 - d. A small planning support staff should be established in a new Policy and Planning Support Office reporting to the Administrator, to analyze and integrate planning within the agency and to publish and update agency plans.
(See also VII-9-c).

VI. INSTITUTIONAL MANAGEMENT

7. Strengthen agency-wide leadership in developing and managing people, facilities, equipment, and other institutional resources. The NMSG believes the more attention needs to be given at headquarters and the centers to improving the management of NASA as an institution, both to make current agency operations more efficient and to assure the future strength of NASA capabilities. The NMSG recommends that NASA:
- a. Appoint an Associate Deputy Administrator-Institution to provide a focus on institutional management in the Office of the Administrator. This official would assist, and when appropriate act for the Administrator and Deputy Administrator on institutional matters generally, including determination of requirements and distribution of resources for manpower, facilities, and institutional funding.
 - b. Strengthen the institutional management capabilities of the Program Associate Administrators, who should continue to be responsible for supervising NASA field centers as at present. Each Program Associate Administrator having supervision of a field center must assure the center's responsiveness to the requirements of programs assigned by other Associate Administrators.
 - c. Establish institutional planning as an integral part of the NASA planning process, to include planning for personnel, facilities, major equipment and support service contractor requirements and for the evolution of the assigned roles and missions of NASA Centers. A small staff focused on institutional planning should be included in the new Policy and Planning Support office recommended below (VII-9-c).

- d. Place a new special management emphasis on human resources in NASA to enhance efforts to acquire, retain, and make full utilization of the best possible people to conduct and manage NASA's work. Where necessary to meet its special needs, NASA should seek administrative or legislative relief from general government requirements that impede effective human resources management.

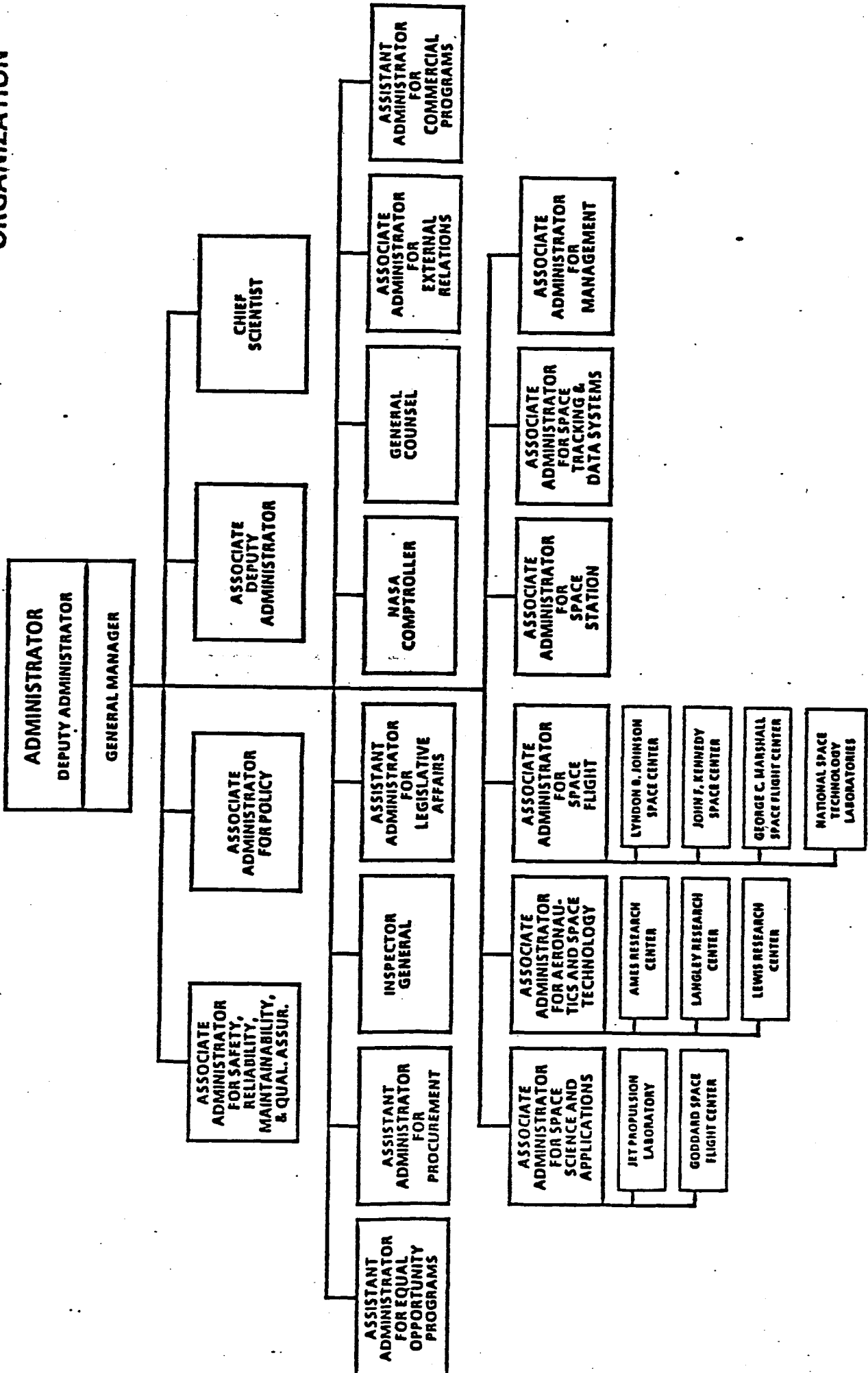
VII. EXECUTIVE MANAGEMENT

8. Improve management of NASA's external relations.
 - a. Give special management attention to ensuring that NASA:
 - (1) Keeps Congress informed on a timely basis of matters of importance or special interest.
 - (2) Is effectively represented in dealings with other agencies, other governments, and industry.
 - (3) Maintains the NASA tradition of openness in its relations with the media and the public.
 - b. Consolidate under the Associate Administrator for External Relations the functions of public, international, and industry affairs, with either defacto or actual responsibility for legislative affairs.
 - c. Reaffirm to all headquarters offices and field centers the requirement for consistent agency policies and actions in external affairs under the functional management leadership of the headquarters staff offices.

9. Strengthen the Office of the Administrator and ease the workload of the Administrator and Deputy Administrator. The NMSG believes that these needs can best be addressed by appointing two new senior officials within the Office of the Administrator and the establishment of a small policy and planning support staff unit. Specifically, NASA should:
- a. Appoint an Associate Deputy Administrator-Policy to assist, and where appropriate act for the Administrator, on policy, external affair, and related matters. The Administrator continually faces problems in the policy and external affairs areas that are growing in number and complexity. Coping with these problems now requires major personal involvements of the Administrator, creating the risks of insufficient attention to policy matters, missed opportunities for leadership, and diversion from other important responsibilities. The Associate Deputy Administrator-Policy would share the Administrator's and Deputy Administrator's workload and help ensure effective use and participation of NASA staff and program offices in policy matters and external affairs.
 - b. Appoint an Associate Deputy Administrator - Institution to assist, and where appropriate act for the Administrator or Deputy Administrator in the management of NASA as an institution (VI-7-a).
 - c. Establish a small Policy and Planning Support Staff for policy analysis and to support the program and institutional planning processes. This staff would provide a resource for the Office of the Administrator to perform or coordinate selected policy studies and analyses as assigned, and to assist in the review of studies and analyses done elsewhere in the agency. It

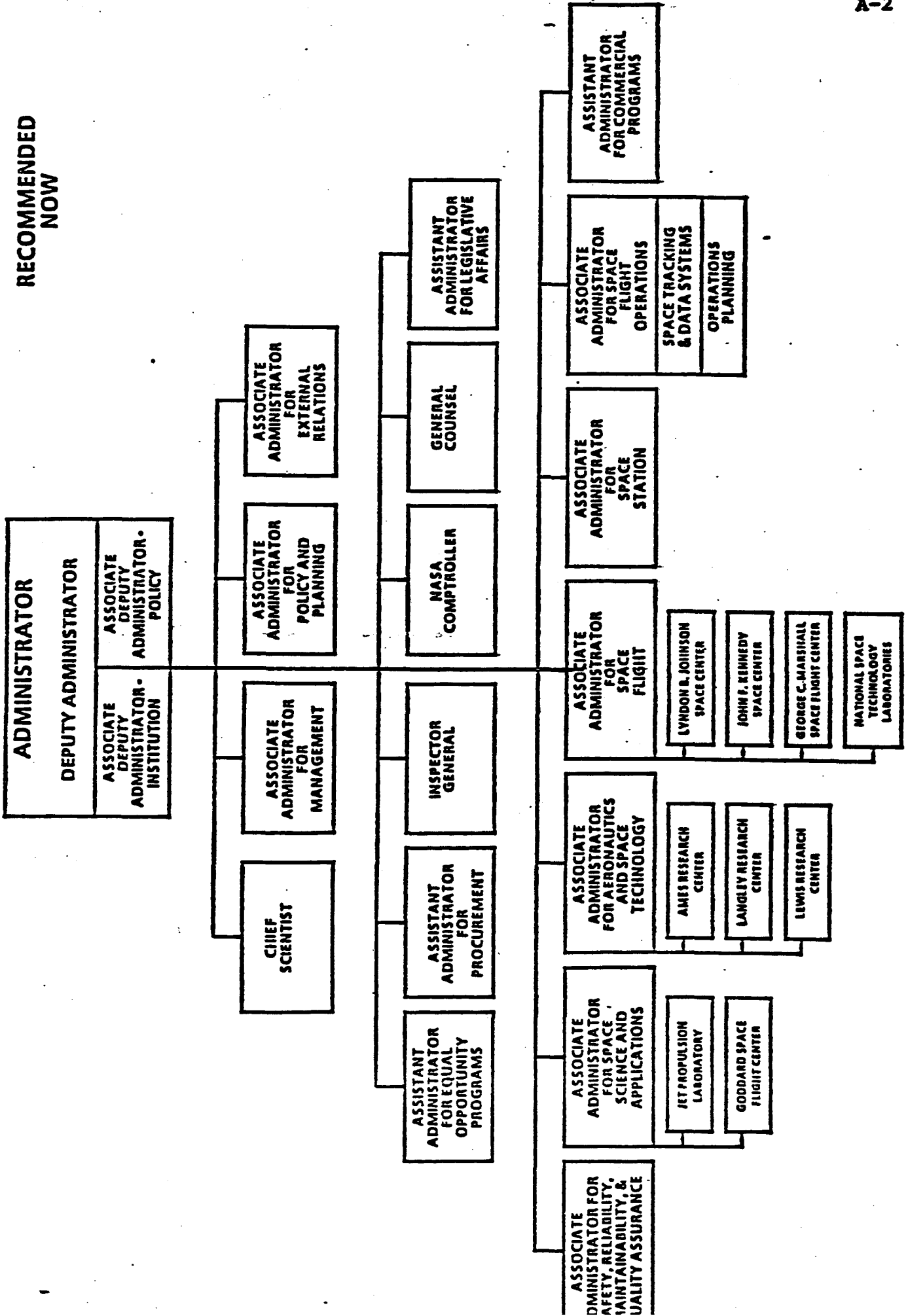
would also provide support for the program and institutional planning processes as previously recommended.

CURRENT ORGANIZATION



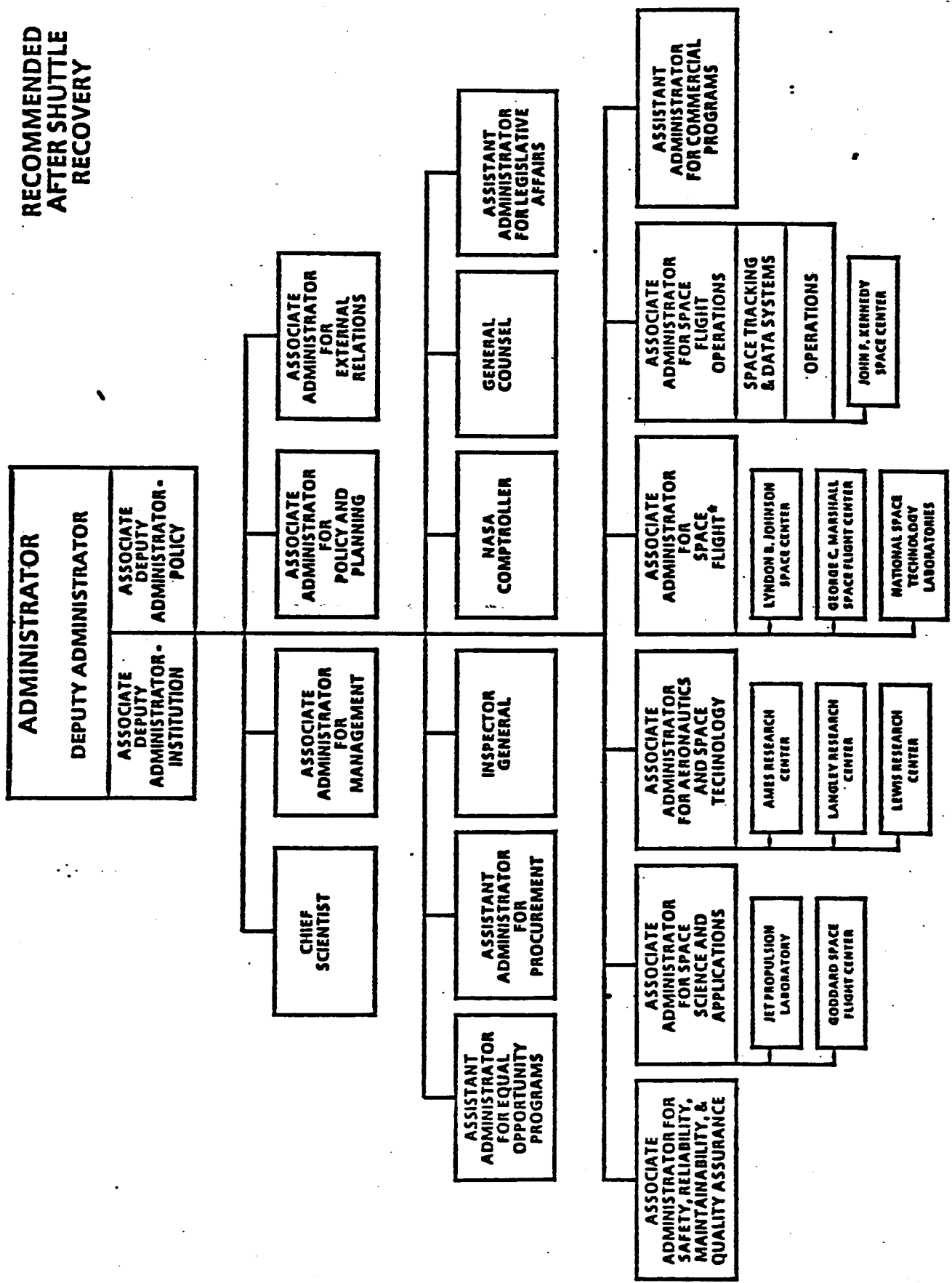
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RECOMMENDED
NOW



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RECOMMENDED
AFTER SHUTTLE
RECOVERY



• INCLUDES BOTH SPACE STATION AND SPACE SHUTTLE PROGRAMS

National Academy of Public Administration
Advisory Panel
to the
NASA Management Study Group

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