
NASA Organization and Management from 1961 to 1965: The Vision and the Reality

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NASA Administrator James E. Webb had been in office only three months before President Kennedy announced his decision for a manned lunar landing. Webb was in charge of a rapid acceleration in the NASA budget and staff. While the program build-up was under way, Webb instigated a series of internal management analyses and reviews, some of which were extensions of initiatives taken by his predecessor. One of the major problem areas first explored was the Headquarters-Field Center relationship, one which has been studied and reorganized almost continuously ever since.

During NASA's first three years, the field Centers reported to Headquarters program directors rather than to general management. There were two major weaknesses in this system. The subordination of Center directors to Headquarters program directors tended to create a gulf between the field and Headquarters. Secondly, the Headquarters program offices tended to be more narrowly focused than the more multi-purpose field Centers, and there was a mismatch in the missions and institutional interests of the various field Centers and their respective program offices in Washington.

In November 1961, the first of many subsequent reorganizations was authorized, putting the field Centers directly under the Associate Administrator, Robert C. Seamans, Jr., who was later to become Air Force Secretary. The field Centers continued to receive specific program direction from the program offices, but were no longer subordinate to the program As-

sociate Administrators. Earlier in his first year, Webb had authorized another major reorganization, establishing a new Office of Programs and an Office of Administration based on a unit previously called the Office of Business Administration. The Office of Programs was responsible for integrating NASA's program planning, facilities coordination, management planning, resources programming and project reviews. As a means of exercising this function, the office established the Program Approval Document (PAD) system to govern the process of Headquarters review of specific programs. This new office and the Office of Administration both reported to Robert Seamans.

The 1961 reorganization fell short of expectations. Three reasons attributed to the failure were: 1) the tendency of the new structure to create a "free-for-all" between the field Centers and Headquarters, 2) the undermining of the authority of Headquarters program directors to give direction over anything but specific, discrete projects, and 3) the imposition of a crushing overload of responsibilities on a single Associate Administrator, Robert Seamans. Although the 1961 reorganization had served to remind Centers that NASA had a central purpose to which all local interests were secondary, it could not be maintained as a permanent arrangement.

In November 1963, the structure reverted back to one in which field Centers reported to the Headquarters program office responsible for their primary program activities. As Webb

observed several years later, the purpose of the 1963 reorganization was to emphasize that a Headquarters program director, newly designated as an "Associate Administrator," was "a guy running his show . . . and that he ought to think of himself as nearly as possible doing the total job. He had to present his program to Congress he wasn't just an internal manager. For his area he had almost as broad responsibility as the Administrator."¹

Nevertheless, important aspects of Seamans' role as "general manager" remained unchanged. The program Associate Administrators continued to meet regularly with him, and he continued to oversee the various internal management systems such as the PAD process. The decision to switch the Field Center-Headquarters relationship back to what had existed only two years before illustrates Webb's belief in the importance of flexibility and adaptability. In Space Age Management: The Large-scale Approach, a volume based on his Columbia-McKinsey lectures delivered in 1968, Webb wrote as follows: "Our constant effort has been to obtain a sufficient real-time feedback from the fastest-moving parts of our substantive and administrative activities to enable us to alter our course as needed. We have sought patterns of organization and administration that facilitated fast reaction times to signals of incipient failure or emerging opportunity."²

What Webb recognized as an essential part of the ethos of NASA was the need for a continuing process of adjustment and adaptation to dynamics of change both within and outside the agency. He saw that NASA could not be governed by the old-style principles of public administration which sought to assure stability and order within a rigid hierarchical framework. To accommodate the fast-moving scientific and technological projects for which NASA provided a home, NASA would have to stay loose. The components of the organization: the field Centers and Headquarters; the program and project offices imposed on a ma-

trix organizational structure; the complex of in-house management; and the much greater corpus of outside contractors -- this vast array of disparate parts could never be expected to become a stable and harmonious entity. In an unpredictable and sometimes turbulent environment, Webb recognized a need to maintain a desired level of disequilibrium.

This philosophical approach has been accepted within NASA throughout the post-Webb era, but with varying degrees of commitment. Much of NASA's subsequent organizational history has evolved around the weighing of tradeoffs between the risk-taking, free-wheeling management style, and the search for more traditional values of order, continuity and stability.

Centralization versus Decentralization

The search for the best organizational pattern has also entailed a continuing quest for the best blend of centralization and decentralization. Several issues have been critical to the structure of the reporting relationships between the field and Headquarters.

1. How to maintain the desired degree of autonomy and independent initiative at the field Center level.
2. How to assure that the Headquarters program Associate Administrators exercise adequate control over their respective programs without engaging in "micro-management."
3. How to provide for adequate communications between the Administrator and field Center directors without overwhelming the Administrator or undercutting the program Associate Administrator.
4. How to find an individual with the right personality to serve in the Headquarters office to which the field Centers report.

Experience with the several types of reporting relationships suggests that there is no single "right" way to set them up. What works at one time may not necessarily work at another. The arrangement should be responsive to the management imperatives of the contemporary environment. In any case, the success of the total complex of reporting relationships depends on the crossfeed of significant and meaningful information among those having a "need to know" and the timely upward flow of the important information to whomever is responsible for the agency's general management.

In the early days of NASA, the field Centers tended to have more discrete roles and thus to work only or mostly on programs falling under a single Headquarters program office. There was an obvious logic in clustering groups of Centers under the several program offices at Headquarters. Over the years the field Centers, each seeking to build capability to compete for future projects, expanded their respective areas of competence. At the same time, as the dimensions of the larger manned flight programs such as the Shuttle grew, the number of Centers working on a single program increased correspondingly. Thus a new configuration evolved in which most of the Centers were working on programs falling under more than one Headquarters program office.

Personalities and Personal Relations

The question of personality cited above is a crucially important -- some would say the most important -- factor in determining how well the Headquarters-Field Center reporting relationship works. Obviously it is essential that the individual to whom the Center directors report in Headquarters be someone in whom they can place their confidence. The job calls for a rare combination of experience and talent -- including an ability to understand the Center directors and to represent them in an even-handed way -- and a toughness in implementing sometimes unwelcome decisions.

The relationships between Headquarters and the field reflect in large measure the chemistry existing among the personalities of the Administrator, the Deputy, the Associate Administrators for programs, and Center directors. Ideally, all these players should fit together as a closely knit and mutually supportive team. They should be able to understand each others' needs and subordinate the goals of their respective positions and organizations to the broader goals of the agency.

Strength Through Diversity

Since the real world is, in fact, far from the ideal, a state of such harmony is always elusive. People in Washington and people in the field can never have the same perspectives and values. The Washington outlook is dominated by the power politics of the nation's capital and the struggle to maintain NASA's place in the federal establishment. Center outlooks are more oriented to specific research and development tasks to be accomplished. Moreover, from Center to Center there is a built-in rivalry. Each Center nourishes an absolute conviction that it is the best of the lot. Each Center is hard at work to make its own place strong and secure in whatever lies ahead for NASA. No Center is willing to reveal its entire hand to other Centers or, for that matter, to Headquarters. Nevertheless, Centers can and do cooperate effectively on agency programs and projects. In the process, they share facilities, people, and ideas. Institutional loyalties, however, tend for the most part to stay fixed.

Thus NASA is significantly different from many large decentralized organizations in either the public or private sector. Compared with the military establishment, for example, NASA often appears to resemble the collection of military services operating with considerable rivalry under the Department of Defense rather than a single military service. Indeed, the competition among the Centers is mostly a positive force spurring each Center to excel in

comparison with its peers. In the private sector the closest analogy would be a loosely-knit conglomerate with autonomous profit centers rather than a fully integrated single-line company.

In the case of either the public or the private analogy, all the elements of the organization share common goals but may differ sharply on the means for reaching those ends. The job of top management is to see that the best means are selected out of the competing ideas advanced by the various contenders in the organization. The NASA Administrator must attend to a great deal of advice, often conflicting, from contractors, the scientific community, and the numerous NASA advisory bodies. The Administrator's task is to maintain the U.S. position of strength in our aeronautics and space programs, building on the diversity of policies, programs and resources over which varying degrees of control are exercised.

Once an idea has prevailed in the internal competition among all the technical and professional experts, the Administrator must sell the idea to those who hold the purse strings. Thus a NASA Administrator will be judged in large measure by success or failure in persuading the President, the Office of Management and Budget, and the Congress which programs will best support the aeronautical research and space interests of the nation.

The Triumvirate

Another hallmark of Webb's administration was his acceptance of the concept of shared decision-making at the top. We have noted the important role played by Seamans as an internal manager. Hugh L. Dryden, who had formerly headed the National Advisory Committee for Aeronautics and served as NASA Deputy Administrator under Glennan, had remained in the deputy position under Webb. Dryden was a highly respected aerospace scientist with a vast network of connections throughout the scientific community.

During the years until Dryden's death in 1965, the three top leaders of NASA -- Webb, Dryden, and Seamans -- formed a triumvirate in which all three worked as a team in every sense of the word. Webb insisted that each was to be a full-scale participant in administrative as well as substantive decisions. As James Beggs noted in the inaugural lecture of the National Academy of Public Administration's James E. Webb Fund for Excellence in Public Administration:

"It was agreed that in policy and practice no one of the three would act to do violence to the strongly-held views of the other two. The three were committed to ensure that all of NASA's leadership needs were considered and met at all levels."

Webb himself described the three-man relationship as one which intentionally bound the three men in "hoops of iron." A major application of this policy was a process requiring that all procurement decisions over \$5 million be made by all three men. They reviewed the recommendations of a technical/managerial team representing the most informed thinking on any individual procurement up to their level. Each final selection was made by the top three executives.³

Seeking Outside Advice

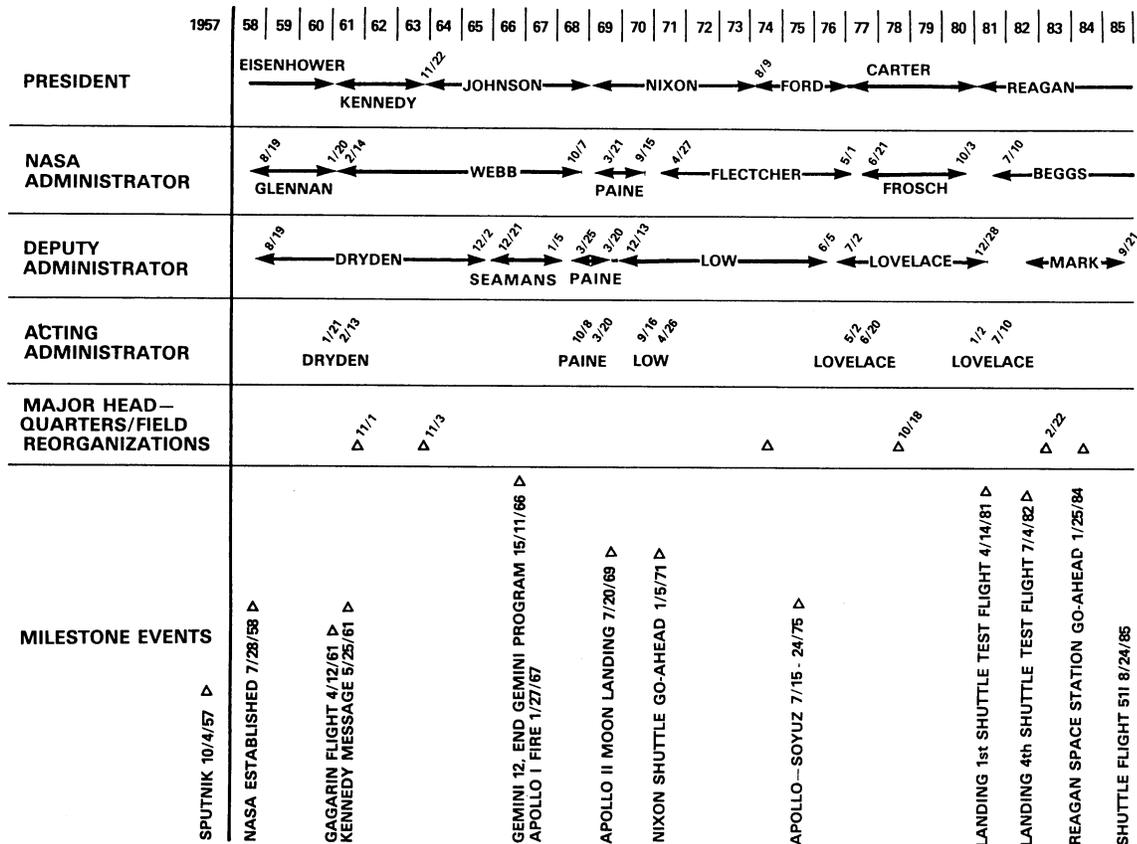
One of Webb's guiding principles was to spread the toughest problems over the largest possible number of capable minds. As the member of the triumvirate who served as "Mr. Outside," Webb was especially interested in seeking outside advice. Nearly ninety cents out of every NASA budget dollar was spent outside the agency, mainly in contracts with the aerospace industry, which provided a major source of advice on engineering and technical questions. Webb also fostered an imposing network of university and academic relationships. Through the Sustaining University Program initiated by Webb in 1961, NASA

over the next decade channeled more than \$100 million to academic institutions in support of research and the doctoral programs of more than 5,000 scientists and engineers. An additional \$42 million was channeled to universities for construction of research facilities on 31 campuses. Webb was thus able to tap into the best thinking of industry, the academic community, and the able people whom he gathered together within the agency. He extensively used management consultant teams and individuals, and the many special advisory committees and panels set up by the National Academy of Sciences.

Because of his special interest in administration and management, Webb was elected President of the American Society for Public Administration (ASPA) in 1966. He soon

came to see the need for an organization which could perform an equivalent role in public administration to that of the National Academy of Sciences in its field. He felt that NASA and other government agencies should have access to a source of trusted counsel that could give advice on questions pertaining to management and administration. Accordingly, Webb organized those who had preceded him as ASPA presidents to become the founders of the National Academy of Public Administration.

NASA provided the initial funds that permitted the academy to open its doors while conducting some initial studies of NASA management. The granting of a federal charter to the Academy in 1984 represented a major milestone in the fulfillment of Webb's vision 17 years earlier.



Reorganization: A NASA Management Refrain

As noted in the earlier discussion of the reorganization during the Webb administration, the Field Center-Headquarters reporting relationship has undergone many permutations throughout the agency's history.

In the spring of 1974, Dr. Fletcher and his colleagues began to believe that in a period of budget reduction such as NASA was experiencing, the Headquarters-Field Center reporting alignment was no longer responsive to overall agency needs. Accordingly, another major reorganization was implemented, establishing for the first time an Office of Associate Administrator for Center Operations. Two subsidiary offices, one for Institutional Management and a second for Headquarters Administration, were set up under this new Associate Administrator.⁴ Again, as in the period from 1961 to 1963, the field Centers reported to a single Headquarters office. The new Office of Institutional Management, responsible for agency-wide institutional management, was a response to concern in the field about inadequate attention in Headquarters program offices to institutional resources, namely the equipment, facilities, and personnel required to sustain the technical and scientific capability of the Centers.⁵

In his second year in office, Fletcher's successor, Dr. Robert A. Frosch, found that the Field Center-Headquarters reporting relationship put into effect four years earlier by Dr. Fletcher was not working to the satisfaction of most of the key people involved. Frosch instituted a first-ever system in which all the Centers and all the program Associate Administrators reported directly to him. The new system gave the Center directors direct access to the Administrator, but it stretched the span of control beyond what is generally regarded as reasonable limits.

The fifth reorganization of the Headquarters-Field Center relationship was carried out by the next Administrator, James E. Beggs, who reinstated the system in which the field Centers report in clusters to the program offices. This configuration ran into some of the same types of problems confronted in the past under similar arrangements. Each of the Centers worked for more than one program office. The Centers felt that too little concern was given by their respective program offices to the institutional health of the Centers. Center directors were not satisfied that the program offices represented their interests in Headquarters decision-making. Old refrains were being heard again and another reorganization appeared to be in the making.

Looking Inside Today's NASA

(Note: Although this article was written in 1985, some of the insights are applicable today. -- Editor)

Today's NASA retains many of the same attributes that have distinguished the agency since its formation. Much of the management philosophy developed in the agency's first ten years and articulated by James Webb still guides today's management. The basic organizational structure, the high degree of autonomy accorded to the field Centers, and the heavy reliance on contractors as the principal agents to do the work still remain as important features of the NASA *modus operandi*. Perhaps most remarkable [as of 1985] is the continuity of personnel. NASA has one of the lowest turnover rates of any federal agency. Most of NASA's highly skilled technical and professional employees know that the excitement and challenge of their jobs cannot be matched elsewhere. Even though many of NASA's senior staff have skills and talents that are readily marketable in the more highly paid private sector, they choose not to move.

The negative side of this personnel profile is the fact that many NASA employees now approaching retirement eligibility are likely to leave in a mass exodus over the next several years. This problem is compounded by a scarcity of potential leaders between the ages of 30 and 40 -- a gap caused by low recruiting levels in the cutback period of the 1970s. Recently, however, NASA has had great success in recruiting highly qualified college freshouts. The NASA mission still attracts topflight scientists, engineers, and technicians.

Regardless of its recent success in attracting quality personnel, NASA suffers today from many of the same exigencies that afflict other departments and agencies of the federal government. The environment for these federal organizations has been severely damaged by the anti-bureaucratic rhetoric so prominent in recent political campaigns and the excessive zeal of those seeking to gut the federal workforce. Equally damaging has been the vast array of rules and regulations, promulgated largely in response to Congressional pressures, that have resulted in tighter limits on the ability of government managers to manage.

The vigor and vitality of NASA in its early years came in large measure from the sense within NASA that the agency was its own master. Congress appropriated the money; NASA executed the program. The management of the agency was more than willing to assume responsibility and accountability for the expenditure of the public funds entrusted to it.

Today's management climate is vastly different from that of NASA's early years. Like other federal agencies, NASA finds itself under the close scrutiny of numerous Congressional committees, each with its own particular agenda and priorities and each seeking information in more and more detail. With such information the committees can carry out their oversight function to the point of what often appears as micro-management.

A major instrument of congressional oversight is the General Accounting Office (GAO). Staff of GAO, working with the greatly expanded (some would say overblown) staff of the Congressional committees, are constantly looking over the shoulders of all federal managers. At the same time, the central agencies of the executive branch -- the Office of Management and Budget, the Office of Personnel Management, and the General Services Administration -- have imposed layer upon layer of regulations resulting in increasingly centralized management systems. As a result, managers at all levels are forced to devote excessive amounts of their time and energies to the filing of forms and writing of reports. In such basic areas as personnel, procurement, travel, and budget management, managers find that they have only limited freedom of action. During NASA's early days, decisions were made at all levels of management on a timely basis, but today's decision-making process moves more slowly and ponderously. Whereas key individuals or small groups took responsibility for decisions in the past, today that responsibility tends to be spread out among larger groups or committees.⁶

An inevitable result of having so many watchdogs and so many centralized regulatory systems is inhibiting initiative and the willingness to innovate or take risks. Instead of delegating responsibility to lower levels, each level of management feels compelled to retain tighter controls and more decision-making authority. Thus NASA Headquarters program offices exercise what the field Centers regard as micro-management, and the working relationship between the two levels is strained. At lower levels throughout the agency, managers are diverted from their principal tasks by the need to comply with the regulatory overload.

Despite these negative forces working against good management, NASA stands out as one of the best run agencies in the federal establishment. The high standard of NASA performance owes much to the innate drive of NASA

personnel to strive for excellence. NASA's workforce, by virtue of its high levels of education, training, and motivation, represents an elite corps. They take great personal pride in their participation in a program which is so highly visible and so much a symbol of American leadership in science and technology. The continuing high level of job satisfaction in the agency ties directly into the fast-paced technical challenges inherent in the lofty goals set out in the NASA charter and the commitment of space activities "to peaceful purposes for the benefit of all mankind."

While much has remained constant in the NASA physiognomy, significant change is under way in the nature of NASA's mission. Until the era of the Shuttle, that mission consisted mainly of various scientific exploration and technology development programs of limited duration. As an R&D organization, NASA was by nature devoid of any operational role. The implicit prevailing assumption was that once a space science mission had been accomplished, the results would be turned over to the scientific community for investigation. Likewise, in the aeronautics research area, findings were turned over either to potential commercial users or to the military establishment. The Space Shuttle and the Space Station, each being long-term operational enterprises, pose a new set of questions with respect to the most appropriate institutional home.

The question of the best institutional base for the Shuttle came up for discussion and analysis as the development phase got under way. In 1977, James Beggs, then Executive Vice President of General Dynamics, chaired a panel of the National Academy of Public Adminis-

tration that considered various organizational alternatives for the Shuttle. The report of the panel concluded that unless and until the economics of the Shuttle provided a basis for attracting private investment, the best organizational alternative was to retain the Shuttle in NASA.⁷

In the eight years since that study was conducted, the prospects for turning the Shuttle into a net revenue producer have changed for the worse rather than for the better. Although many in NASA would welcome an opportunity to hand over the Shuttle to some other organization in order to refocus NASA on its traditional R&D tasks, there are no other appropriate alternatives in sight.

Looking ahead to the point in the 1990s when the Space Station is scheduled to become operational, it appears that a similar set of questions will arise. Indeed, for as long as one can see clearly into the future, it seems that the NASA mission will include, in addition to the traditional time-limited R&D activities, a responsibility for the maintenance of operating systems providing access to and a permanent manned presence in space. Six field Centers are now involved in the Space Station program. Such major changes under way in the mission of NASA will probably call for further agency-wide organizational adjustment and restructuring.

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