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# Strategic Planning as a Focus for Continuous Improvement A Case Study

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## Introduction

What do most of the successful people and organizations in our world have in common? Instead of worrying about the future, they work to create it. They have a plan, or a vision of what they want to accomplish and they focus their efforts on success.

Strategic planning has been described as a disciplined, ongoing process to produce fundamental decisions and actions that shape what an organization is, what it does, and how it will respond to a changing environment. This case study discussion will evaluate the relationship between strategic planning and Total Quality Management (TQM), or continuous improvement, through the experience of the NASA Johnson Space Center in developing a strategy for the future. That experience clearly illustrates the value of strategic planning in setting the framework and establishing the overall thrust of continuous improvement initiatives. Equally significant, the fundamentals of a quality culture such as strong customer and supplier partnerships, participative involvement, open communications, and ownership were essential in overcoming the challenges inherent in the planning process. A reinforced management commitment to the quality culture was a clear, long-term benefit.

## The Johnson Space Center: The Culture and the Challenge

The NASA Johnson Space Center (JSC) is located in Houston, Texas. JSC is the NASA Center most clearly associated with human space-flight development and operations. The JSC team is made up of approximately 3600 NASA employees and more than 13,000 contractor personnel. JSC's primary mission is the expansion of human presence in space through exploration and utilization for the benefit of all. This is accomplished by developing and maintaining the technologies and capabilities which are essential to building and operating human space vehicles for exploration of the solar system. As a Federal Government field center, JSC is somewhat comparable to a subsidiary for a large corporation. We are geographically

separated, have a specific business focus, and are somewhat autonomous in day-to-day operations, although we must pursue the direction of NASA Headquarters, the Executive Branch, and the Congress.

The JSC culture has been built upon the foundation of leading the Nation's human space flight activities emphasizing safety in space and on the ground, dedication to mission success, and working to reduce the cost of space operations. With this rich history, the management of JSC still faces a crisis. As noted by most leading experts, a sense of crisis can contribute to a fertile environment for the acceptance of TQM. This was indeed the case at JSC. The crisis or challenge facing the Center in building the future had four primary elements:

- Supporting multiple programs at various stages of development was still relatively new to us. We had to plan and implement our work using processes that were not one-program specific but could be applied across a range of activities, all of which supported our exploration focus.
- We were not sufficiently process oriented in our approach to programs. There was a tendency to continue using organizational interfaces, work methods, and support systems suited to the research and development phase, when more standardized processes would yield greater quality and efficiency.
- With increasing external pressures and numerous advisory groups and commissions offering recommended directions for the future, it was imperative that the Center establish its own clear vision and roadmap to the future. While external recommendations had to be considered, JSC needed a baseline for their evaluation.
- The resource base was shrinking. In the face of flat or declining budgets, we had to improve the way we did business and significantly reduce the cost of our programs, particularly the cost of long-term ownership and operations.

The potential of using continuous improvement fundamentals and tools to meet quality and cost reduction goals was clear. This, in turn, led us to focus on strategic planning as the means of articulating an overall framework and integrated set of goals and objectives that would serve as the long-term targets for process improvement initiatives.

### Buying-In to the Process

In March of 1991, the JSC Senior Staff met to discuss the implementation of TQM at the Center. All agreed that the lack of an effective strategic planning process was the top business issue and that it was time for JSC to define how we intended to support NASA's future and the future of our Nation's Civil Space Program.

An updated plan was needed to help the Center focus its vision for the future, and to set a clear direction for the Center. A review was needed of JSC objectives, roles, responsibilities, and capabilities. The last strategic planning effort was conducted following the Challenger accident in 1986 and was appropriately oriented toward the recovery process and the re-establishment of program goals. Much had been accomplished since then, and significant issues of the future had become more clear.

From the onset, the JSC Center Director and senior management emphasized that the establishment of an ongoing planning process incorporating continuous improvement principles was as important as the issuance of a strategic plan. The past planning effort had not provided for any ongoing or follow-on strategic planning activity, nor had it involved all the senior management of the Center, thus limiting its "ownership" and implementation. To gain and retain ownership of the participants throughout the development of a strategic plan, the planning process itself was evolved through a participative effort. A Strategic Planning Subcommittee, reporting to the JSC Total Quality Steering Committee, was established. The Subcommittee, comprised of deputy directors from major line organizations, was supported by an in-house staff knowledgeable in strategic planning. The Subcommittee reviewed earlier planning efforts, researched other organization's processes, and brainstormed ideas for an effective process. The result was not a "textbook approach" to planning, but one that fits JSC's unique culture (refer to Figure 1).

Very early in the evolution of this approach, it was decided that strategic planning would drive tactical planning in all major organizations. Because of the challenge of setting an overall direction for the future, the Center strategic plan would respond to the JSC perception of Agency and national Civil Space objectives. The Strategic Plan was intended to state the Center's vision and mission as well as the goals and objectives necessary to actualize that vision. The statement of implementation objectives would be handled in subsequent implementation plans which would be prepared by each major organization at the Center.

#### Building Consensus on Goals and Objectives

Several strategic planning retreats involving all senior managers and deputies were held. While each retreat was designed to focus on a specific part of the planning process and provide a forum for the resolution of issues, the retreats really served another critical purpose. The retreats allowed the top managers to negotiate common perspectives of the Center, its objectives, and their organization's role in meeting them. The retreats not only allowed management to come to consensus on assumptions, but more importantly, to help identify the highest priority issues. Management examined where they thought the Center was today, and challenged whether that really was where they wanted it to be in the future. Throughout the retreat process, a variety of methods and tools were used to stimulate thought and discussion, including development of a helpful databook which outlined the

# Strategic Planning Process Flow

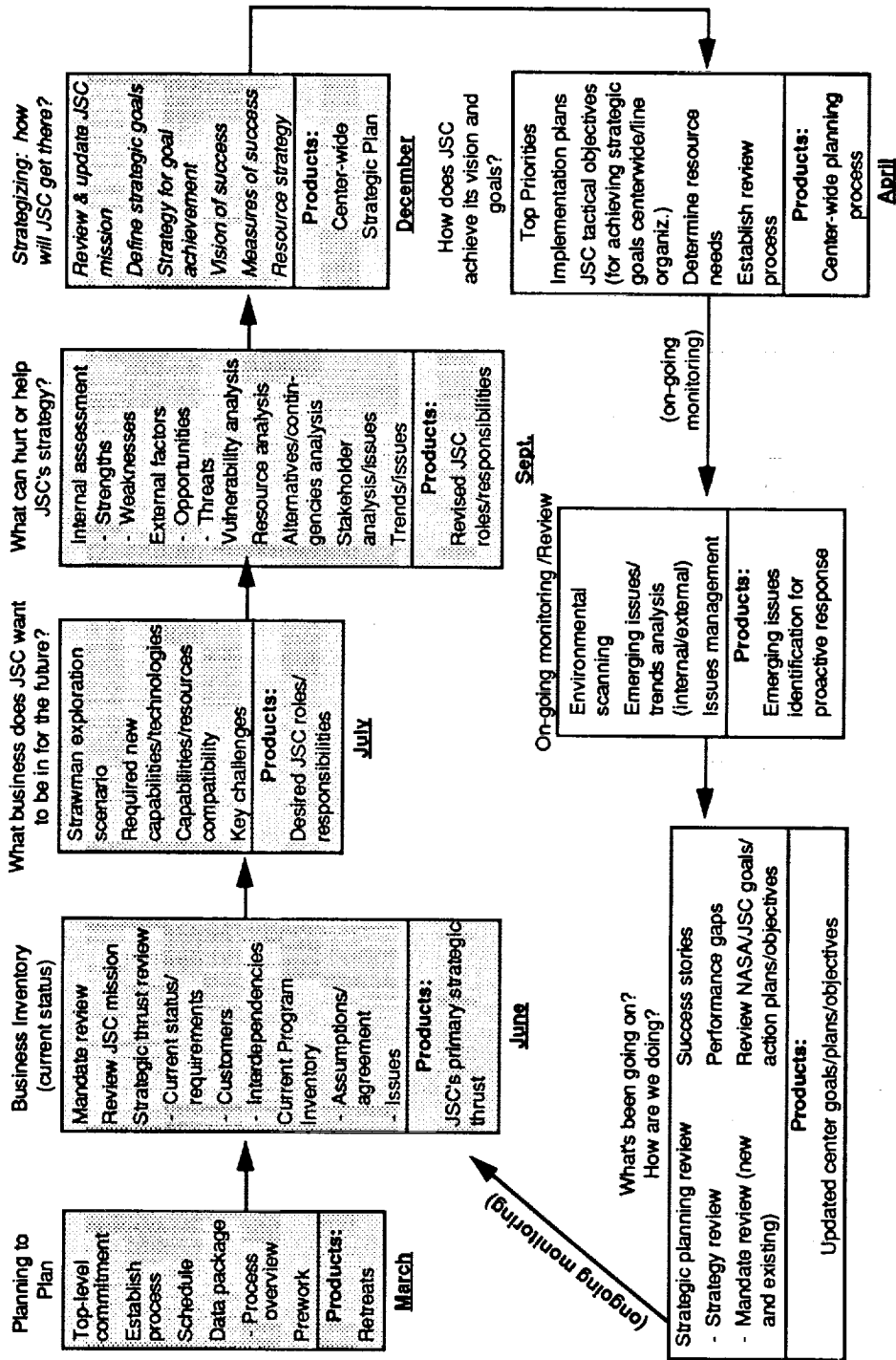


Figure 1.- Strategic planning process flow.

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strategic planning process and presented strawman assessments of the external environment and issues. Homework, position briefs, small group break-out sessions, nominal group technique, and brainstorming were all utilized.

The process led to a redefinition of JSC's primary strategic mission. The Center, originally named the Manned Spacecraft Center, has always held "manned space flight" as its primary purpose. The conclusion was reached that JSC is really in the business of "human space exploration" which incorporates not only human space flight, but many of the other aspects of human space science and engineering that are required to achieve that broad and ambitious goal. Managers then identified how their organization's responsibilities fit into the overall exploration mission, and found the linkages between programs such as the Shuttle, the Space Station, and the Space Exploration Initiative (SEI).

In pursuing the space exploration mission, it was decided that an initial assessment of goals and objectives should be relatively unconstrained by resource and fiscal realities. This approach was driven by the axiom - nothing new and ambitious will be forthcoming if all the reasons why it cannot or should not be done are addressed first. To evaluate internal capabilities, desired Center roles, and the human resources and facilities necessary to carry out these responsibilities, we used a hypothetical scenario and timetable for an SEI which covered President Bush's mandate of a human return to the Moon to stay and the exploration of Mars. Then the vulnerabilities, external constraints, and the total funding requirements of the multi-program approach to Shuttle, Space Station, and SEI were assessed. Each center organization presented what resources such a scenario would require, what issues it would create, and new ways to do business that would be necessary to meet the scenario. When we compared the resources we needed in the "best of all possible worlds" with the funding we could realistically expect, senior management realized that new ways of doing business were essential if we were to achieve the Presidential mandates, and our own mission, for the future.

### Developing the Plan

How to do business better became a major theme of the final Strategic Plan, which we developed using a Critical Design Review process similar to that of flight systems and, therefore, familiar to management. Our process included inputs from each directorate, and supporting analyses which were prepared by special teams of line managers and employees. "Experts" throughout the organization provided inputs and critiqued the plan as it was being developed. Also, we did not take an exclusively JSC focus in our planning efforts. A National Space Council representative and a NASA research center representative participated in some of our planning sessions. In the future, we would like to get other NASA centers involved so we can include ideas from these important customers and partners in our planning.

Pioneering Space Exploration: The JSC Strategy 1992, which is essentially a 5 to 10-year roadmap for the Center, was distributed to all JSC employees and contract organizations in January. Because an ongoing strategic planning effort is inherently dynamic, we are making changes as necessary when new conditions arise, such as the change of Administrators and the subsequent Red/Blue Team activities.

### Positive Outcomes

What could well prove to be the most long-lasting positive impact of the strategic planning process was the recognition by senior management of the need for a formal, ongoing strategic planning and action management process at the Center to assure that resources are applied to those activities that best support our human space exploration mission. To this end, the Executive Council, made up of Senior Staff and chaired by the Center Director, was established as the decision-making body for TQM and strategic management. It makes resource allocation decisions and resolves any issues that arise with Plan implementation.

An important tool of the Executive Council is the JSC Strategic Filter, designed to assist in setting priorities and allocating resources between current projects and new activities, including major continuous improvement projects (refer to Figure 2). The filter criteria is designed to allow the Center to pursue those activities that are directly related to our mission and pass on those that do not fit within our defined future. The filter has two stages. First, the Executive Council determines if the proposed project fits our mission, roles, and strategy. If there is a strategic fit, the Executive Council looks at resource criteria in the second phase. If resources are available, the project can be pursued; if no resources are readily available, top management must decide if it is possible and desirable to invest the resources to do this activity - - to give up something else in order to do it. If so, we must step up to the necessary changes to meet it.

Commitment by top managers, especially the Center Director, has the two-fold effect of dynamic participation in the process and a level of common awareness that allows all participants to represent a unified JSC position in external arenas. Every director and deputy literally signed up for this plan (refer to Figure 3).

Education and improved communication among Senior Staff members are other positive outcomes of the strategic planning process. The planning retreats offered the first real opportunity for Senior Staff to openly and informally discuss concerns, issues and ideas. Each director provided insights about their department's roles, concerns, and direction that may not have been fully shared before. Although senior managers meet at least weekly to discuss Center business, these meetings do not provide the right impetus for brainstorming and idea generation. Several managers said this open interaction was most useful to them and recommended

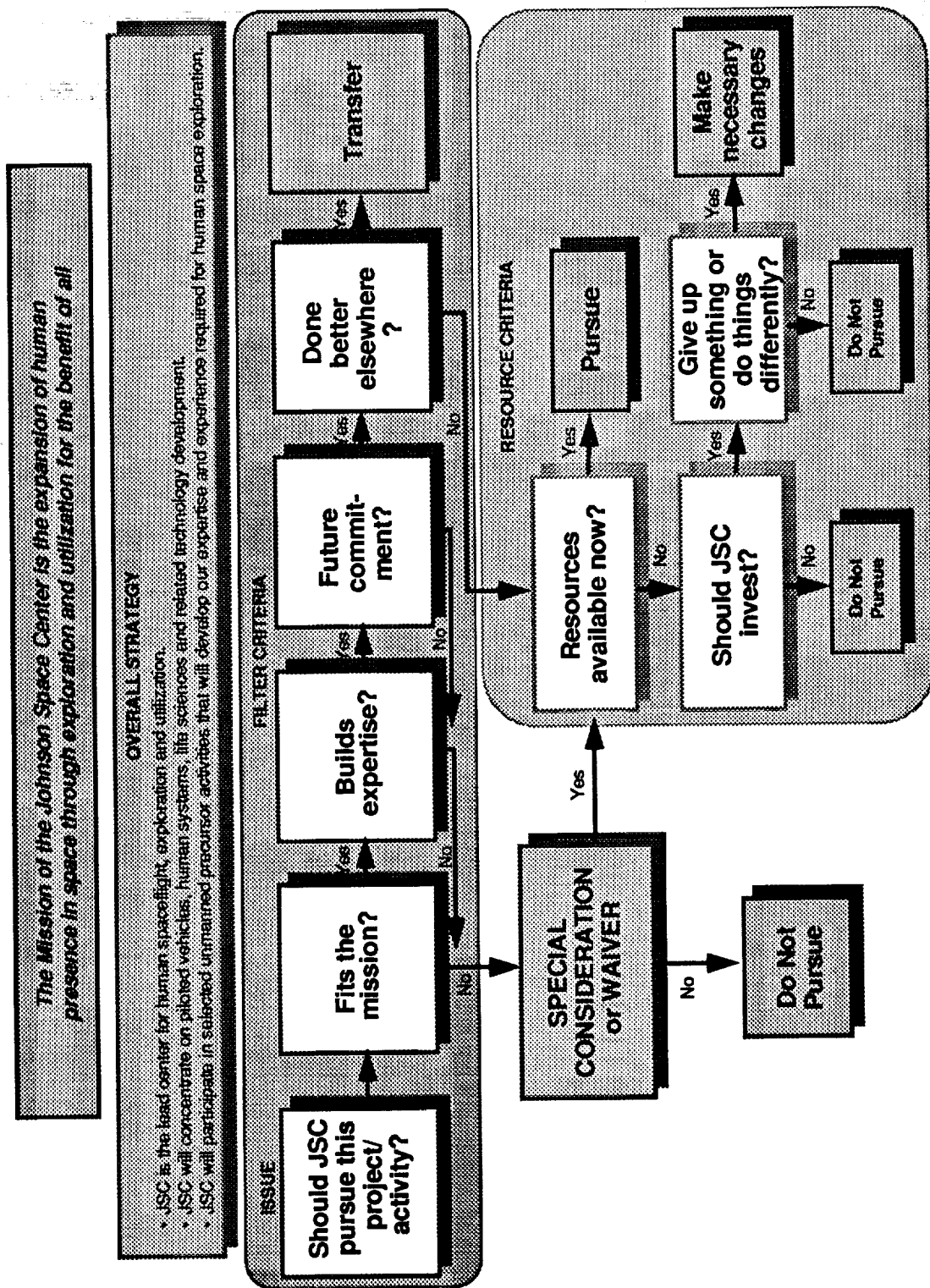


Figure 2.- JSC strategic filter.

*Ann Blair*

Center Director

Office of the Director

*Paul Weitz*  
*Daniel A. Gehrig*  
*Clarke Covington*  
*John Young*  
*Joseph S. Taylor*

Human Resources Office

*Harvey Friedman*  
*Gregory W. ...*

Administration Directorate

*John Kelly*  
*Thomas Young*  
*K. E. ...*

Legal Office

*Edward K. Fein*

Office of Public Affairs

*John Ward*

Equal Opportunity Programs Office

*Frederic M. Marks*

New Initiatives Office

*John Whaley*

Mission Operations Directorate

*John W. O'Neill*

Engineering Directorate

*Thomas P. ...*

Space Shuttle Program Office

*Leonard S. Nicholson*

Space Station Freedom Program and Operations

*John ...*

Flight Crew Operations Directorate

*Donald R. ...*

Center Operations Directorate

*John ...*

Space Station Projects Office

*John ...*

Office of the Comptroller

*John ...*

Safety, Reliability, and Quality Assurance Office

*Charles ...*

Information Systems Directorate

*Charles ...*

White Sands Test Facility

*John ...*

Space and Life Sciences Directorate

*Casalyn L. ...*

Orbiter and GFE Projects Office

*John ...*

Lunar and Mars Exploration Program Office

*Douglas K. ...*

Figure 3.- Signature page.



that such informal sessions become a regular part of continuous improvement and planning.

Our experience demonstrated that strategic planning and continuous improvement must be accomplished together to be fully successful. The JSC strategic planning process increased the awareness by senior management of the need for continuous improvement in our administrative, program management, and operations management processes. The need to "do business better" has become a top management byword. The continued involvement of the Strategic Planning Subcommittee and Total Quality Steering Committee in the implementation of the Strategic Plan is another positive sign.

The strategic planning process was not only a unifying and useful tool for management, but also led to the honing of the skills of a small in-house strategic planning support staff. We looked to the project planners in our advanced projects organization and to facilitators from our Human Resources department to help develop and support a strategic planning process tailored to the Center's unique needs.

The skills and knowledge of the in-house support staff enabled much greater flexibility in the process. Rather than adhering to a specific "textbook" format, the planning team had the flexibility to make "mid-course corrections" as necessary to the planning process. These mid-course corrections were not looked upon by senior management as failures, but rather underscored the adaptability of strategic planning to any contingency. For example, mid-course corrections often were needed during retreats to resolve misunderstandings or to accommodate new thoughts or issues that developed.

### Implementation

Each JSC organization is now in the process of developing an implementation plan that will provide the tactical strategies and measurable objectives for carrying out the 1992 JSC Strategic Plan over the next 3 years. Each organization has been encouraged to emphasize an inherent strategy of using TQM techniques, processes, and philosophies to achieve business efficiencies in all possible areas.

The implementation plans will contain the action steps, schedule, and cost and performance metrics necessary to communicate what we intend to accomplish and the means to measure our progress and success on a program and project-specific basis. Many questions surround the future of the NASA budget and the outcome of the Agency Red and Blue Team activities. We believe that we have developed a sufficiently flexible ongoing strategic planning process to allow us to respond to changes in policy and direction as they arise. The implementation plans will be in place in time for the beginning of a new cycle of strategic planning and the 1993 update of our Plan.

## Lessons Learned

The path followed through the resulting strategic planning process reached the goal of coming up with a roadmap for JSC's future, but there were many challenges along the way.

Identification of major customer requirements for a public sector organization presents difficulties. A private sector company is usually designed with a marketing orientation and easily identified customers.

A large public sector organization like NASA finds its external environment, especially political stakeholders, changing rapidly. Public sector activities are also highly visible. This is especially true in NASA's case, with public scrutiny of every space flight.

For JSC, defining a meaningful, realistic, and traceable set of customer requirements upon which to build a plan for the advocacy and support of NASA programs has been a formidable task. Is the customer the American taxpayer or their elected representatives? Or, are our customers the other government agencies, payload investigators, foreign countries and others for whom we fly missions? With our matrix organization, many internal customers exist, such as the programs and projects supported by the institution. Identifying the true customers is a major challenge, and TQM customer assessment techniques are being used to address this challenge as we enter Plan implementation.

Assessing the external environment also proved more difficult than anticipated. Our strategic planning databooks, given to each director and deputy, highlighted external issues, stakeholders and concerns. The managers felt comfortable reviewing external issues they dealt with on a regular basis such as Federal budget concerns. However, a thorough analysis of strengths/weaknesses/opportunities/threats (SWOT), stakeholders, and other external vulnerabilities was not possible without extensive review of public policy and competing national priorities. An issues assessment action team has been formed to assess methods for developing a better understanding of our external environment so we could be more proactive toward emerging concerns and opportunities.

Implementation is often the most difficult part of the planning process and the place where most planning failures occur in both the public and private sectors. Detailed operational action plans that include cost, workforce and facility projections, milestones, and areas of concern must be developed. Managers must commit to action and necessary changes in their own organizations to meet the needs of the Center and Agency. The initial buy-in for the overall planning does not necessarily eliminate "turf" battles during implementation planning. The continuous improvement process provides a framework to help break down these barriers and build trust that will help develop our planning process over time.

We were slow implementing the Plan after publication. This allowed other pressing needs and external changes to supersede implementation. An important lesson learned is that implementation planning should immediately follow strategic plan development and must be considered a top priority of all management. In fact, implementation should begin before the planning is complete in areas where actions are clear.

Communication of the plan, strategies, purpose, meaning, and intent to all employees is vital. Line managers, in particular, need to be kept updated on the planning process so they can provide inputs as appropriate and have ownership. Employees must be aware that the strategic planning process takes time, that it is ongoing, and that they have a stake in the planning activities. A feedback mechanism must be provided so inputs can be reviewed by top management and updates incorporated where necessary in the process.

### Future of JSC Strategic Planning

The process of setting new directions for NASA has begun with the Red/Blue Team activity. This will promote more coordination among JSC, Headquarters, and other NASA Centers in developing strategies for the future. Also, as more NASA organizations become involved in strategic planning, more networking, idea sharing, and joint problem solving occurs.

We have a process in place that has management acceptance. As implementation plans are developed, we are refining the strategic planning process. We are beginning the monitoring and evaluation phase, looking for internal or external changes that may impact the plan, looking for disconnects, and searching for ways of doing business better. With the Executive Council and filter process in place, we are assured of implementation and feedback to line organizations.

Strategic planning never ends. It should provide a focus for continuous improvement in all areas and benefit from the application of continuous improvement principles to the strategic planning process itself. We learn from doing, just as our NASA team learns from planning and carrying out a space mission:

To plan a space flight, we must first understand the technical requirements and mission objectives. Contingency planning for anomalies is vital. Innovative procedures or hardware may be necessary to rescue a stranded satellite or perform a complicated on-orbit maneuver. Flight crews and controllers simulate every conceivable scenario, so they can handle and adapt to the demands of a hostile space environment. Flight plans are tested and reassessed up to launch time. Most crucial of all is building a team linking many

organizations and disciplines, who make the seemingly impossible happen.

Can planning the future of human space exploration be less?