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**BUILDING A QUALITY CULTURE  
IN THE OFFICE OF SPACE FLIGHT:**  
Approach, Lessons Learned and Implications for the Future

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**INTRODUCTION**

The purpose of this paper is describe the approach and lessons learned by the Office of Space Flight (OSF), National Aeronautics and Space Administration (NASA), in its introduction of quality. In particular, the experience of OSF Headquarters is discussed as an example of an organization within NASA that is considering both the business and human elements of the change and the opportunities the quality focus presents to improve continuously. It is hoped that the insights shared will be of use to those embarking upon similar cultural changes. The paper is presented in the following parts:

- The Leadership Challenge
- Background
- Context of the Approach to Quality
- Initial Steps
- Current Initiatives
- Lessons Learned
- Implications for the Future

\*The opinions presented are those of the author and do not necessarily represent those of the organization.

**THE LEADERSHIP CHALLENGE**

As we work towards maintaining or achieving world class excellence in multiple arenas, American public, academic and private sectors are faced with innumerable challenges, including the economy, jobs, the environment, education, health care, new technologies and international competition. To maintain or achieve world class status, particularly in a period of declining fiscal resources and competing interests, is a target of opportunity

for American government, academic and industry leaders to manage creatively and in partnership. In these changing times of: (1) working in a more global context; (2) increased customer expectations for quality, timely and efficient products and services; and, (3) reduced resources to work with, the opportunities for Americans to rethink approaches to business and culture are imminent. This refocus is particularly timely as we plan for the 21st Century and work to improve our leadership posture both nationally and internationally in all facets of life.

Proven successes abroad and in major American companies using the quality approach to change and continuous improvement have caused those of us in the Federal government to take note. The quality approach to business and cultural change is perceived by Federal managers as one which may help them: reduce the traditional bureaucratic barriers of overregulation; streamline procedures and operations; improve communications; optimize the use of human resources; and, reduce unnecessary layering and duplication. Agencies such as NASA have embarked upon a Federal quality tradition which emphasizes top management leadership and support, strategic planning, focus on the customer and the supplier, employee empowerment and involvement, employee development and recognition, measurement, and results.

While NASA has evidenced its external value for quality during the past decade with its George Low Excellence Award for the aerospace and related industries, the agency's internal corporate quality focus has been most notable during recent years under Administrators Richard Truly and Daniel Goldin. NASA centers, such as Johnson Space Center, Lewis Research Center, and Marshall Space Flight Center, have led the way for the agency in quality and have been recognized externally by the Federal Quality Institute and the President's Council on Management Improvement for exemplary Federal initiatives.

NASA headquarters organizations have followed the NASA centers during the past two years and have undertaken numerous quality initiatives from a corporate or headquarters-specific perspective. Consistent with quality's emphasis on "lessons learned" and "benchmarking" others, the following description is presented of how one NASA headquarters organization, the Office of Space Flight, has pursued quality. Discussed are the background, the steps taken, the lessons learned, and implications for the future.

## **BACKGROUND**

The Office of Space Flight (OSF) is one of five NASA program offices. It is responsible for providing executive leadership, overall direction, and effective accomplishment of NASA space flight operations and utilization programs concerned with the Space Shuttle, Spacelab/Space Station Freedom, and other space flight operations. In cooperation with other NASA organizations and suppliers, OSF space transportation capabilities have made possible discoveries about the universe and Earth, material and life sciences, and the application of new technologies.

**Customers.** OSF supports a wide range of customers, including public and private sector interests and foreign governments. Foremost among the customers of the civil space program is the American public, to whom OSF is committed to bringing the highest quality effort in the most cost-effective manner. In addition, OSF carries out the objectives and goals established by the NASA Administrator in support of the direction set by the President and Congress. Other customers include the NASA program and functional offices, government agencies, foreign governments, commercial industry, colleges and universities, and elementary and secondary schools.

**The Organization.** OSF consists of an executive Headquarters office in Washington, D.C., and four field centers: the Lyndon B. Johnson Space Center in Houston, Texas; the John F. Kennedy Space Center in Brevard County, Florida; the George C. Marshall Space Flight Center in Huntsville, Alabama; and, the John C. Stennis Space Center in southwestern Mississippi.

The Associate Administrator for Space Flight, who reports directly to the NASA Administrator, manages an extensive institutional and technical base. This encompasses four OSF centers and consists of an annual budget of approximately \$4.8 Billion and more than 10,000 NASA civil servants supported by 30,000 contractor employees.

The OSF team represents the diverse range of disciplines needed to support the management of project development, operations, and implementation. Expertise is maintained in numerous fields, including engineering; administration, human resource, information resource, facilities, and resource management; meteorology; policy; and, systems analysis. OSF Headquarters provides executive business management and broad policy direction. It is responsible for resources management, program management, advanced planning, institutional management, space flight manifesting, strategic planning, and external representation.

This paper focuses primarily on the OSF Headquarters quality initiative, which was pursued in the context of the Five Phases of Quality Maturity and the President's Quality Award criteria. The timeframe involved is August 1990 - present.

### **THE CONCEPTUAL FRAMEWORK FOR THE OSF HEADQUARTERS APPROACH**

In pursuing quality, OSF Headquarters leadership was influenced by initiatives undertaken by the OSF Centers (Kennedy, Johnson, Marshall, and Stennis), other Federal agencies, and leading aerospace and non-aerospace corporations. To provide a conceptual framework for its approach, OSF considered the *five phases of quality*, which were developed by the President's Council on Management Improvement and the Federal Quality Institute, to provide a developmental context for Federal agencies pursuing quality. Also considered were the *eight President's Quality Award criteria categories*, which also provide a framework for quality pursuit.

The "Five Phases of Quality", which were developed by the President's Council on Management Improvement and the Federal Quality Institute to serve as guidance to agencies in determining where they are with respect to achieving "world class" status, are:

**Phase 1: Deciding Whether to Implement TQM.** In this phase, the organization's top executives are actively considering whether to embark upon a TQM effort. This phase may include only the steps necessary to become aware of what TQM includes and its benefits, such as attending an awareness seminar, attending a training or conference on quality, or personal and organizational research. It may be as short as a decision to do it after a brief introduction, to as long as several months of gathering data and information upon which to base a formal decision.

**Phase 2: Getting Started.** A formal decision has been made to embark upon a TQM effort, and a formal announcement has been made to do so, either to key management staff or the entire organization. The Getting Started stage usually lasts about a year, and may consist of such activities as:

- Establishing a quality council or other body to direct the quality improvement effort;
- Developing quality vision, mission and policy statements;
- Assessing the organizations readiness and culture;
- Reviewing the organization's quality training needs;
- Developing an initial implementation plan including how to target and focus the quality effort and identification of training and other resources to carry the effort forward; and,
- Beginning some of the initial education and training of managers and/or line workers.

**Phase 3: Implementation.** During this phase, specific TQM-related processes designed to improve quality are being adopted. Such actions frequently include formal establishment of Process Action Teams or similar teams of workers to improve operations or eliminate systemic operating problems. Other actions might include identification of internal and external customers and determination of their needs and expectations; analysis of systems and processes in order to streamline operations and build in quality checks in the production process; and adoption of significant new policies designed to further quality management principles such as financial rewards and recognition for teamwork, formalized suggestion programs, adoption of group appraisal systems, and quality-related employee development efforts.

**Phase 4: Achieving Results.** After an organization has been in the implementation phase for a period of time, it should begin to achieve and document significant results flowing from the quality effort. During *Phase 3 - Implementation*, results will begin to occur as the result of individual team actions and Quality Council activity. During *Phase 4 - Achieving Results*, the organization will begin to realize systemic, cross-functional and/or organization-wide achievements resulting from the TQM effort. One individuation of having realized this stage may be if the organization has chosen to apply and is competitive for the Quality Improvement Prototype Award, President's Award for Quality, or similar recognition established by the organization's own agency.

**Phase 5: On the Way to World Class.** An organization that is on the way to World Class has generally incorporated all of the principles and operating practices of TQM throughout its organization in some degree, can point to substantial improvements in quality and customer satisfaction resulting from these efforts, and is making consistent and continuous improvement throughout. Such an organization

would normally be a strong contender, if not actually a winner of the President's Quality Award, and would be compared favorably from a quality standpoint with any other organization in a similar line of work anywhere else in the world, public, or private.

The **President's Quality Award Criteria**, which are modeled after the American industry quality award, The Baldrige Award, for the Federal government, are:

- o **Top management leadership and support**
- o **Strategic planning**
- o **Focus on the customer**
- o **Employee training and recognition**
- o **Employee empowerment and teamwork**
- o **Measurement and analysis**
- o **Quality assurance**
- o **Quality and productivity improvement results.**

In essence, OSF leadership has kept the five phases of quality maturity in mind as well as the critical success factors indicated by the President's Award criteria in the context of its planning for quality. Based on 1991 and 1992 employee survey data, OSF Headquarters employees perceive OSF as being between phases two and three of quality maturity, and that the office has made "start-up" progress in the President's Quality Award criteria categories of: top management leadership and support, customer focus, strategic planning, employee empowerment, and measurement. In the following section, the steps taken by OSF Headquarters in the first two years of its focus on quality are presented. The purpose of the discussion is to provide an example of a NASA organization's approach to quality and the implications for the organization's future as it moves toward the fifth maturity stage of "world class excellence".

## **INITIAL STEPS**

### **Step 1:      Decide to Introduce the Quality Focus to the Organization**

Consistent with the NASA Administrator's emphasis on quality and the value for the changes a quality focus would bring to OSF, the Associate Administrator for Space Flight hired a senior manager with a background in continuous improvement in August 1990. The manager's role has been to advise the Associate Administrator, the OSF Management Council, and the OSF Headquarters Senior Staff on the development of a quality strategy for OSF and the introduction of the quality principles and practices to the organization.

**Step 2: Develop a Strategic Plan Reflective of Continuous Improvement Principles and Practices**

In January 1991, the Associate Administrator for Space Flight convened a meeting of his OSF Headquarters Senior Staff for a weekend strategic planning retreat. The meetings of the team continued through June 1991, and resulted in a strategic plan that reflects a value for customers and suppliers; the OSF workforce; quality, timeliness and efficiency of products and services; and, teamwork.

**Step 3: Conduct Employee Diagnostics**

In April 1991, OSF sponsored a survey of employees with respect to the following criteria: top management leadership and support, customer focus, strategic planning, employee training and recognition, employee empowerment and teamwork, measures and analysis, quality assurance, and quality improvement and productivity results. Over 25% of OSF Headquarters employees participated in the survey, with a 99% return. In addition, focus group discussions of 6 - 10 employees each were held with representatives from the 15 OSF Headquarters business areas. The results of the survey and focus group discussions were considered by the Associate Administrator, the OSF Headquarters Senior Staff, and the OSF Center and Deputy Center Directors during an OSF Executive Quality Retreat held in May 1991.

**Step 4: Conduct Executive Quality Retreat**

OSF continued its quality journey by sponsoring an Executive Quality Retreat for the OSF Management Council and Headquarters Senior Staff in May 1991. At the Retreat, business and cultural issues were identified; individual and group values were established; a preliminary vision statement was drafted; a continuous improvement infrastructure was proposed; ways to strengthen OSF communications and methods for involving more employees in OSF decision making were explored; leadership behaviors were reviewed; and, a continuous improvement action plan was developed.

**Step 5: Develop Continuous Improvement Infrastructure**

*OSF Management Council.* At the Executive Retreat, the participants agreed that to integrate continuous improvement initiatives into the business mainstream of OSF, the continuous improvement infrastructure should build on existing management mechanisms to the extent possible. Consistent with this philosophy, it was decided that the OSF Management Council would oversee the implementation of continuous improvement in OSF. The Management Council, chaired by the Associate Administrator, consists of the Deputy Associate Administrator and the OSF Center Directors and Deputy Center Directors. The Council has advised the Associate Administrator with respect to the OSF vision, strategic plan and governing principles and encouraged continuous improvement initiatives which cross organizational boundaries (including headquarters/center; center/center; program/program;

headquarters/ program and functional offices; OSF/other agencies/Congress; OSF/customers/suppliers, etc.). The Council meets monthly.

*OSF Continuous Improvement Coordination Council (CICC).* The OSF Management Council is supported by the OSF CICC, which consists of the continuous improvement focal points from OSF Headquarters and the OSF Centers. In particular, these are the Assistant to the Associate Administrator for Space Flight; the Associate Center Directors at Johnson Space Center, Marshall Space Flight Center, and Stennis Space Center; and, the Deputy Center Director at Kennedy Space Center. The OSF CICC encourages and facilitates cross-center/ headquarters continuous improvement training, teams and communications. The CICC meets quarterly.

*OSF Headquarters Senior Staff.* \* The OSF Headquarters Senior Staff consists of the direct reports to the Associate Administrator and the Deputy Associate Administrators. This group is responsible for leading and supporting the OSF Headquarters continuous improvement initiatives and encouraging cross-program and functional office teams and headquarters/center team activities. The Senior Staff meets the Headquarters QIC for an extended continuous improvement meeting monthly.

*OSF Headquarters Quality Implementation Council (QIC).* \* The OSF Headquarters QIC consists of senior and mid-level representatives from each of the eight Headquarters offices. Through its four committees - Measures, Search for Ideas, Communications and Education, and Team Support Services - the QIC initiates, coordinates, and supports implementation of OSF Headquarters continuous improvement actions. It also identifies areas of improvement and serves as an interface between the OSF Headquarters workforce, the Associate Administrator, and the Senior Staff. The QIC has been meeting weekly since the first part of May 1991.

\* Note: Each OSF Center has a senior staff and a Quality Implementation Council or similar group of senior officials.

#### **Step 6:      Develop Continuous Improvement Action Plan**

The OSF Action Plan for 1991 - 1992 was developed by the Associate Administrator and the OSF Management Council as a result of the Executive Quality Retreat held in May 1991. Business and cultural areas addressed in the Action Plan include:

1. Delegate accountability and responsibility
2. Clarify roles and missions
3. Improve communications
4. Develop OSF customers, suppliers, products and services focus
5. Sponsor relevant continuous improvement training
6. Develop an OSF strategic plan reflective of continuous improvement goals
7. Increase employee involvement
8. Improve employee development, training and recognition

9. Streamline shuttle operations processing
10. Review Station Station Freedom from the perspective of the customer
11. Use quality tools to improve space flight programs and services
12. Modernize OSF facilities
13. Develop propulsion testing "center of excellence"
14. Improve OSF Headquarters correspondence and action tracking
15. Develop executive and management information systems
16. Identify relevant work processes and measures.

OSF Action Teams were formed to address most of these areas.

### **Step 7: Conduct Quality Training**

To date, over 400 OSF Headquarters employees, including senior managers, have participated in over 8,000 hours of quality training, including:

- Awareness
- Executive planning
- Senior managers' action
- Advanced team
- Boot camp
- Team Building and Quality Tools
- Team Leader and Facilitation.

The training has been provided in cooperation with Marshall Space Flight Center (Martin-Marietta), NASA Headquarters (Coopers & Lybrand), and Rocketdyne Division.

### **Step 8: Develop and Implement Communications Strategy**

One of the major concerns expressed by the employees in the survey was the lack of effective communications. Improvements which have been initiated by the Associate Administrator, the Senior Staff, and the QIC include:

- Quarterly "All Hands" meetings with the Associate Administrator
- Quarterly Division-specific meetings with the Associate Administrator
- Monthly OSF Headquarters Newsletter
- Quarterly OSF Continuous Improvement Educational Seminars
- OSF Continuous Improvement Clearinghouse
- "Walk around" management behavior
- Employee suggestion system
- Annual employee diagnostic survey.

### **Step 9: Conduct Inventory of Customers, Suppliers, Products and Services**

Each OSF Headquarters office was asked to develop an inventory of its customers, suppliers, products and services. The purpose of the inventory was to: develop

management and general employee awareness of OSF-specific customers and suppliers; serve as the first step towards developing customer and supplier networks, feedback and response systems; and, serve as a complement to a subsequent inventory of division work processes and measures which will be conducted.

**Step 10: Represent OSF at/on Agency Quality Forums, Networks and Professional Conferences**

To build awareness of current thinking and practices and to participate as a partner in NASA's quality initiatives, OSF Headquarters has participated as a member of NASA quality councils, planning committees, and internal and external evaluation teams. OSF has also provided representation at key quality forums such as the NASA/Contractors' Conference and the Federal Quality Conference.

**PROGRESS TO DATE**

In the initial phases of quality, a number of products and services have been generated to support the introduction of quality to OSF. These include the following:

**Products:**

- Measures Handbook
- Team Support Services Handbook
- OSF Continuous Improvement Directory
- Employee Survey Instrument and Report
- Internal Application for the President's Quality Award
- OSF Strategic Plan Reflective of Continuous Improvement Goals
- OSF Continuous Improvement Action Plan
- OSF Customer, Supplier, Products and Services Inventory

**Services:**

- Quality Infrastructure (ongoing)
  - OSF Management Council
  - OSF CICC
  - OSF Headquarters Senior Staff
  - OSF Headquarters QIC
- Facilitators' Network (ongoing)
  - 22 trained facilitators
- Team Consultation Services (ongoing)
  - Team Building
  - Facilitation
  - Quality tools
  - Measurement
  - Benchmarking
  - Strategic planning
  - Customer, supplier, employee feedback and response systems

- Continuous Improvement Action Tracking System (ongoing)
- Team Quality Materials and Supplies (ongoing)
- OSF Continuous Improvement Clearinghouse (ongoing)
- OSF Headquarters Newsletter (monthly)
- OSF Continuous Improvement Seminars (quarterly)
- Management/Employee Communications Forums (quarterly)
- OSF Continuous Improvement Representation/Liaison (ongoing)
- OSF Continuous Improvement Training (ongoing)
- Employee Diagnostics (annual)
- Employee Suggestion System (ongoing)
- Benchmarking (ongoing)
- OSF Continuous Improvement Strategic Planning (annual)
- Executive Retreat Planning (annual)

### **CURRENT INITIATIVES**

The following OSF Headquarters initiatives are underway as the organization moves from phase 2 in quality maturity to phase 3:

**Step 11: Renew the OSF Headquarters Continuous Improvement Strategic Plan**

The quality strategic plan is being renewed, with an emphasis on the following strategic thrusts:

1. Ensure OSF management decisions are consistent with the OSF continuous improvement strategic plan
2. Increase customer and supplier satisfaction
3. Improve up, down, and lateral communications
4. Increase involvement of employees and their sense of empowerment
5. Delegate authority to lowest level possible
6. Increase use of continuous improvement tools and teams
7. Develop and recognize employees
8. Enhance use of measurement to determine baselines, goals and progress
9. Evaluate results, modify accordingly, and publicize.

**Step 12: Develop individual, group and organization metrics**

The Associate Administrator has asked each OSF Headquarters director to work with their respective staffs to develop individual, work unit, and division metrics. The purpose is to develop a baseline of information, establish goals for excellence, and measure progress towards reaching those goals.

**Step 13: Form business and cultural teams with a results orientation.**

Each OSF Headquarters organization has been asked to establish a minimum of one business and one cultural team, with an emphasis on results. Each team has been asked to provide a charter, milestones, anticipated deliverables, and recognition strategy.

**Step 14: Develop and implement an individual, group and organization continuous improvement recognition strategy.**

The OSF Action Team which was formed in 1991 to develop improvements in employee development, recognition and training has recommended ways in which recognition can be expanded beyond the traditional individual recognition to one that acknowledges the accomplishments and contributions of teams and organizations. Forms of recognition will be both monetary and non-monetary, with an emphasis on the latter.

**Step 15: Practice succession planning as part of employee development.**

The OSF Employee Development, Recognition and Training Team has recommended that succession planning be made part of an employee's development in OSF Headquarters. The planning will include individual development plans and specific strategies to provide training, rotational job assignments, mentoring opportunities, and potential progression alternatives as part of an employee's career planning.

**Step 16: Include continuous improvement as part of the performance appraisal plans**

Specific continuous improvement criteria and performance elements which are qualifiable and quantifiable will be encouraged for each OSF Headquarters employee. The goal is for each employee, starting with management, to be viewed as walking and talking "examples of quality excellence" in all aspects of their business and cultural activities.

**Step 17: Develop customer and supplier feedback and response systems.**

To complement the employee suggestion system which has been developed by the QIC Search for Ideas Committee, a customer and supplier feedback and response system will be encouraged in each of the OSF Headquarters organizations. Networks

which provide for increased communications between OSF and its customers and suppliers will be fostered. The goal is to enhance customer and supplier planning and operational capabilities through these forums for joint problem-solving and quality process improvements.

#### **Step 18: Implement network management**

To date, most of OSF Headquarters' quality efforts have been focused inwardly. Network management - the process of establishing linkages with those critical or related to the business and culture of the organization - enables managers to move beyond the traditional forms of managing to one that is dependent on networking, interactive, and outreach skills - one that seeks accomplishment through teams and the ability to work constructively with those in similar program and/or functional areas within and external to OSF. The interactive networks which are formed provide critical interconnectivity among organizations and serve as catalysts for information-sharing and benchmarking - determining the "best of the best".

### **LESSONS LEARNED**

OSF Headquarters lessons learned to date support the theses of quality implementation espoused by supporters of the President's Quality Award and the Malcolm Baldrige Award:

1. **Critical to the success of the initiative is top management leadership and support. Without it, the change is piecemeal and suffers from a lack of continuity and comprehensiveness.**
2. **Also key is early training of the employee population, beginning with management and reaching the entire workforce. Particularly important is quality awareness, team building, quality tools, team leader and facilitation training. Without awareness and the skills necessary to initiate quality practices, it is unfair of management to expect quality-like behavior and results.**
3. **Development of an infrastructure provides leadership, communications, planning and implementation forums internal to the organization for the change.**
4. **A continuous improvement strategic plan that sets forth strategic thrusts and implementation strategies provides a framework for the organization to embark upon the quality changes.**
5. **A strong communications strategy enhances employee understanding of the quality initiatives internal and external to the organization.**

6. An emphasis on **teamwork** within and across work units provides a critical impetus to the quality initiative. Without teams and the sense of employee empowerment, little progress can be made towards desired results.
7. Key to the success of teams are **facilitation skills** among the members, the team leader or a trained facilitator. These skills enable the team to progress towards its goals and ensure the quality tools and techniques are applied during the team process.
8. The development of relevant **measures and analysis** is critical to establishing baselines, goals and progress indicators key to achieving the mission of the organization and "world class status".
9. **Benchmarking** those which are considered the "best of the best" outside of the work unit in whatever program and functional improvement area is being pursued is key to moving beyond the traditional "silo" management mentality held by most organizations.
10. **Recognition** of individuals, groups and organizations serves as an important incentive to members of the organization in getting started and sustaining the quality initiative.
11. A meaningful and relevant **results** orientation in team formation, process, reporting, and accomplishment is key to successful quality implementation.
12. Key to relevant results is a linkage of the team's efforts to the **strategic planning, management and budget processes**. This ensures the business and cultural change proposals are reflected in the day-to-day operations and future planning of the organization.
13. An **outreach** management approach is essential to the organization's sustained successes and continuous improvements. Effective networks with customers and suppliers and those agencies and companies external to the organization are the channels for improvement suggestions.
14. **Patience** by management and the employees is crucial. As noted by experienced quality organizations, the business and cultural changes embarked upon take time. They require courage, compassion, curiosity and competence - continuously.

### IMPLICATIONS FOR THE FUTURE

As OSF Headquarters moves towards quality maturity in phases 3,4, and 5, it is helpful to keep the following implications for the future in mind:

- o Quality will be dependent upon a strategic vision, collaboration among all interested parties, the development of a "critical mass" of quality supporters, teamwork at the corporate levels, and systemic planning;
- o Communication internal to OSF and with the customer community - predominantly the American public - regarding the "return on investment" in space is increasingly important in times of reduced Federal resources and increased customer expectations;
- o The organization may follow the corporate example of "flattening", becoming increasingly dependent on high individual performers who are able to manage through networks;
- o Greater use will be made of customer, supplier and employee feedback and response systems as sources of ideas for improvement.
- o Greater use will be made of benchmarking as a planning and assessment tool to achieve and maintain world class status.
- o Employees will feel more empowerment to form teams and provide suggestions back to management on ways to improve.
- o Two-way appraisal systems will become the norm, enabling management and the employees to stay abreast of improvement opportunities in all facets of worklife.
- o The NASA Administrator, the President, the Congress, and the American public will expect to see "reader-friendly" tie-ins between continuous improvement initiatives and the agency budget. These will include both cost savings achieved and improvement investments that are quality-related.
- o Lessons learned will be shared routinely internally and externally, and results effected by quality initiatives marketed effectively to other agencies, industry, academia and the general public.

## **CONCLUSION**

Through the identification of business and cultural opportunities for change, the formation of teams to address those issues, focus on our customers and suppliers and understanding their requirements, and the application of quality tools to improve processes and solve problems, OSF will be able to meet the challenges of the coming decades and deliver America's future in space - helping NASA to be the "best of the best" in the world.