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Executive Response to Changing Fortune: Sean O'Keefe as NASA Administrator

Transformation of Organizations Series

Space Shuttle *Discovery* takeoff, July 26, 2005

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IBM Center for
The Business of Government

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FOREWORD

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On behalf of the IBM Center for The Business of Government, we are pleased to present this report, "Executive Response to Changing Fortune: Sean O'Keefe as NASA Administrator," by W. Henry Lambright.

What is the role of an executive in a rapidly changing environment? How does the executive manage his or her organization as the winds of fortune veer and the situation changes? How does the executive seek to change the situation, and is the executive changed in the process? These are the questions that Henry Lambright addresses in an insightful study of the tenure of Sean O'Keefe as administrator of the National Aeronautics and Space Administration.

This is Professor Lambright's second study of a NASA administrator supported by the IBM Center for The Business of Government. In 2001, the Center published "Transforming Government: Dan Goldin and the Remaking of NASA." The two studies cover the last 13 years of NASA under two administrators with dramatically different management styles.

Professor Lambright describes how O'Keefe faced three difficult situations during his three years at NASA. His first challenge was to solve the space station's financial mess. Then, in his second year, came the *Columbia* shuttle disaster. O'Keefe steered NASA through the *Columbia* inquiry and initiated needed organizational changes to enhance safety within the organization. O'Keefe used the disaster to help forge a new direction for NASA, and get a presidential decision supporting the new direction, as well as a funding strategy to move NASA in that new direction. In the third year, President Bush announced the moon-Mars decision, and O'Keefe became its steward, seeking to sell it to Congress and the nation. As he did so, he tempted fortune through his own decision to cancel the extremely popular Hubble telescope. Lambright concludes that in each situation, O'Keefe responded differently and used different management skills: O'Keefe as a financial manager, O'Keefe as a disaster leader, and O'Keefe as an embattled policy entrepreneur.

The turbulence O'Keefe experienced during his tenure was tense and dramatic, but not unusual. Every executive faces changing situations. According to Lambright, the central lesson of O'Keefe's experience for executives is that each must be prepared for the unexpected. Shifting experiences will occur for most executives, many beyond any leader's full control. Sometimes they will win and sometimes they will lose in their contest with fortune. But they must anticipate change and be forceful in meeting the tests that come their way. We trust that this report will be useful and informative to all executives, in both the public and private sectors, as they face unanticipated events and changing fortunes.

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EXECUTIVE SUMMARY

Sean O'Keefe served as administrator of the National Aeronautics and Space Administration for slightly more than three years—from December 2001 to February 2005. These were tumultuous years, with the *Columbia* tragedy by far the dominating event. In reality, O'Keefe's tenure was composed of three distinct periods. The first marked the time from his arrival at NASA until *Columbia* disintegrated on February 1, 2003. During this time, he concentrated on reducing the cost overrun afflicting the International Space Station (ISS) and other managerial issues of less visibility. *Columbia* and its lengthy aftermath of investigation consumed much of the second period, from February 2003 to January 2004. It was also a period when O'Keefe used *Columbia* to get a "transformative" decision.

On January 14, 2004, President George W. Bush came to NASA to announce his "space exploration vision"—to the moon, Mars, and beyond. The vision was a direct result of *Columbia*'s impetus, and owed much to O'Keefe's behind-the-scenes maneuvers. The period from January 2004 to February 2005, when he left, marked the third period of the O'Keefe era. O'Keefe emphasized the "exploration vision." He spoke of "transformation" at NASA. He reorganized the agency to begin implementing the new priority, and sought to sell the vision to Congress, the media, and the American people. At the same time, he was forced to defend his decision, leaked inadvertently after the Bush vision speech, to terminate the immensely popular Hubble Space Telescope. When he departed to become the chancellor of Louisiana State University, O'Keefe was both praised and harshly criticized. He left a number of activities for his successor, most notably the shuttle's return to flight.

Period One: Consolidator and Incremental Innovator

There was no inkling that O'Keefe's tenure at NASA would be marked by such turmoil. O'Keefe's first year, when he engaged in the financial and managerial reform for which he was well suited, was relatively quiet and non-controversial. President Bush had asked O'Keefe to move from deputy director of the Office of Management and Budget (OMB) to NASA administrator to mitigate the $4.8 billion projected cost overrun on the International Space Station, NASA's flagship project. Bringing a number of new officials on board, some from OMB, he quickly built a new team and began getting his arms around ISS. He pulled power up to headquarters and away from Johnson Space Center, which had controlled manned spaceflight under his predecessor, Dan Goldin. He spoke of "one NASA," a way to integrate strengths of the entire organization and initiate reforms in accounting practices so NASA would be better able to track its expenditures. In March 2002, O'Keefe gave his own "vision" speech, and made it clear that he was not after destination-driven missions (moon or Mars) but would instead point NASA to go where science directed. This science-driven approach coincided with a renewed emphasis on building NASA's research and development (R&D) base and the development of new technologies, including space nuclear propulsion. He also emphasized the need to attract young "human capital" to the space agency. Revitalizing NASA's Educator-In-Space program, he created a new division oriented to education.

O'Keefe was interested in exploration, but he wanted to use a "stepping-stone" approach. This entailed unmanned and manned probes, working in sequence as appropriate. As befit a man called

a "bean counter"—a term he used to refer to himself—O'Keefe stressed the need for NASA to live within its means. Although he wished to change NASA, his agenda was relatively modest and limited, in contrast to his predecessor's flashy and "let a thousand flowers bloom" strategy.

The sense that O'Keefe was a consolidator and incremental innovator was reinforced late in 2002, when he revealed his Integrated Space Transportation Plan. It called for extending the shuttle's life to 2020 through upgrades and for building an Orbital Space Plane (OSP) to carry astronauts and supplies to and from ISS. The OSP would be a complement to the shuttle, and a much-needed rescue vehicle. It would take some of the workload off of the shuttle in constructing ISS. He also indicated NASA and the Department of Defense would cooperate in a potential long-range program to build a true successor for the shuttle. O'Keefe was generally praised for bringing realism to NASA.

Space enthusiasts wanted more than a "competent manager"; they wanted a bold innovator. However, they were grateful to have a NASA leader well connected with the White House and Congress, and virtually everyone understood that with the war against terrorism and surging deficits holding down space expenditures, the times were against major, expensive initiatives.

Period Two: Crisis Manager

Then, on February 1, 2003, *Columbia* came apart and seven astronauts died. O'Keefe, the self-effacing financial manager, was immediately thrust into the national spotlight. He had to respond to a major disaster. Using a contingency plan he had seen his first day in office, O'Keefe acted swiftly and decisively. President Bush told him to take charge of the investigation and recovery. O'Keefe's goal became to find out what went wrong, fix it, and return to flight as soon as possible. He was acutely conscious that he had ISS orbiting above, and its assembly was now on hold. O'Keefe appointed the Columbia Accident Investigation Board (CAIB), with Admiral Harold Gehman, its chair. From February to August 2003, the Gehman panel labored conscientiously. O'Keefe and Gehman engaged in a close but wary relationship. Both were conscious that the credibility of the CAIB inquiry depended on the appearance and reality of CAIB's independence. Although jarred by one significant test of wills, the relationship worked well. NASA got early information from CAIB on problems, and was able to start quickly with the necessary reforms.

The CAIB report of August blamed (as the immediate cause) foam from the external tank, which shattered tile on the leading edge of a spacecraft wing and made the shuttle vulnerable to extreme heat when it re-entered Earth's atmosphere. CAIB also called attention to various management flaws. It listed among these "schedule pressure" from O'Keefe himself. As part of his strategy to mitigate the ISS financial problems he encountered, O'Keefe had emphasized NASA's reaching a "U.S. Core Complete" deadline in February 2004. This was a stage of assembly between the completion of a U.S.-Russian core and the addition of modules from Europe and Japan. It entailed various U.S. components enabling linkage with the international partners. The aim was to challenge NASA and to prove to Congress and the White House that NASA could in fact manage the space station on time and within budget. If NASA could handle the U.S. Core Complete stage effectively, it would regain credibility and then a decision would be made to move to the final stage of full assembly.

O'Keefe was not really blamed, however, to the point where his resignation was ever an issue. CAIB emphasized "systemic" problems that went back years and that O'Keefe inherited. It especially called attention to an attitude at NASA that had to change from "prove it is unsafe" to "prove it is safe." Space Shuttle *Columbia* failed due to technical and organizational issues that were rooted in history and culture.

In congressional hearings after the report, O'Keefe was pressed on "accountability." He resisted what he called a "public hanging" of NASA employees. He did make personnel changes, but did so quietly and surgically. He was conscious of morale problems and saw no malevolent intent. People make mistakes, he pointed out. In addition to reassigning people and putting new officials in charge in key positions, he made structural changes in the agency to create stronger organizational checks for safety on the shuttle program office. He said he would accept CAIB's report and raise the bar of safety even beyond that demanded by CAIB.

In addition to criticizing NASA, CAIB lamented the nation's lack of will in developing a shuttle successor. It called for "a compelling vision" that would attract more public support to an agency straining to do too much with too little funding. O'Keefe adroitly used the *Columbia* accident and CAIB report to address internal reforms and seek the vision that NASA's friends—and critics—demanded. He guided a lengthy interagency decision process in the second half of 2003 aimed at producing a new "space vision" that President Bush could back. The president proved eager to act in the wake of *Columbia* and called for a bold proposal. O'Keefe responded, even though it meant a radical change from his own vision of March 2002. The president's December 2003 decision was not about science driving mission, but the reverse. He called for exploration—to the moon, Mars, and beyond.

Period Three: Steward of the President's Vision

The President's January 14, 2004, address opened a new period for O'Keefe and NASA. O'Keefe immediately shifted to seller and implementer of the president's vision. Destinations were given emphasis. Now the message was "exploration, informed by science." O'Keefe reorganized NASA to create a new Exploration Systems Directorate and hired a strong-minded administrator as its director. He worked to promote the vision to Congress, the media, and the American people. However, his efforts were obscured to some extent by another decision—to terminate Hubble early by not carrying out a planned shuttle-servicing mission. This decision, which was leaked shortly after Bush's vision speech, came as a shock to most observers, and was almost universally criticized. O'Keefe said he made the decision because of safety concerns. But the media and the scientific opposition saw it as a trade-off in favor of Bush's moon-Mars initiative. O'Keefe sought to bend but not break by calling for a robotic repair mission. This strategy was blunted by the National Academy of Sciences and other experts who pointed out that a robotic mission could not be ready in time to save Hubble.

O'Keefe soldiered on. He gained an initial budget from Congress that provided the substantial funding increase Bush had requested to get the exploration mission started. O'Keefe called the budget and reprogramming authority that accompanied it an endorsement of NASA's new direction. That may have been too strong a word. There seemed to be general support for the exploration vision, however—even if questions about long-term costs remained. *Columbia* had indeed made a substantial difference in attitudes, making clear to most decision makers that NASA needed a compelling goal—beyond circling Earth in a space station—to justify risking lives. A new Crew Exploration Vehicle (CEV) replaced the Orbital Space Plane as the initial hardware step in fulfilling the vision. It would not only replace the shuttle, which would be phased out in 2010, but would be a vehicle enabling a lunar journey by 2020.

O'Keefe exited NASA in February 2005. There were numerous ironies. The financial manager left an agency still criticized for budget overruns and an accounting system needing repair. However, the bean counter whose own 2002 vision eschewed destination-driven goals in favor of more incremental science-driven objectives had engineered a bold presidential vision to the moon, Mars, and beyond. This new direction for NASA would be his legacy *if* it holds in succeeding years. *Columbia* had been the cross O'Keefe had to bear, but it was also the vehicle for transforming NASA as well as O'Keefe.

The Executive Challenge: Responding to Changing Fortune

What is the role of the agency executive in a rapidly changing environment? As the winds of fortune veer and the situation changes, how does the executive direct his or her organization? How does the executive seek to alter the situation, and is the executive changed in the process of interaction with a new environment?

Such questions are age-old, as relevant to the private sector as the public sector. Long ago, in the early 20th century, a great scholar of organizations, Mary Parker Follett, coined the phrase "the law of the situation." The role of the executive, she said, was to "see what the situation demands, to discover the law of the situation and to obey that."[1] Years later, a great practitioner of management, James Webb, who led the National Aeronautics and Space Administration to the moon in the 1960s, believed that the executive's function was to manage the organization and environment so they moved in dynamic harmony. "The environment," he said, "is not something apart from the endeavor, it is not just something in which the endeavor operates and [to] which it needs to adjust; it is an integral part of the endeavor itself.... The total [executive] job encompasses external as well as internal elements, and success is as dependent on effectiveness in the one as in the other."[2]

Both Follett and Webb understood that the "situation" was in constant flux. Movement was the reality, and the situation changed, sometimes suddenly. But if the executive were to succeed, he or she had to stay in control by making whatever actions were required by the situation encountered.

Timeline for O'Keefe as NASA Administrator

Period One: O'Keefe as Consolidator and Incremental Innovator

November 14, 2001	Sean O'Keefe announced to succeed Dan Goldin as NASA administrator.
December 21, 2001	Following Senate confirmation, O'Keefe is sworn in by President George W. Bush.
January 2, 2002	O'Keefe meets with media, emphasizes management, especially financial concerns, will be his priority—not space "fantasy."
April 12, 2002	O'Keefe presents "vision" speech. Eschews moon-Mars destination goals in favor of science-driven objectives. Will develop technological capabilities and give new priority to education. Will revive teacher-in-space program.
November 2002	Develops Integrated Space Transportation Plan as policy initiative. First step is amendment to the budget Congress is considering. Aims to increase funding for shuttle upgrades so shuttle will extend to 2020. A second aspect is Orbital Space Plane (OSP) to be proposed after February 1, 2003, in new Bush budget. OSP will complement shuttle in supplying the station and also serve as crew rescue vehicle.

Period Two: O'Keefe as Crisis Manager

February 1, 2003	Space Shuttle *Columbia* disintegrates over Texas, claiming lives of seven astronauts. O'Keefe authorizes setting up an investigating panel under retired Admiral Harold Gehman.

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Timeline for O'Keefe as NASA Administrator

February 3, 2003	President Bush makes it clear O'Keefe is in charge of the *Columbia* investigation.
February 7, 2003	O'Keefe clarifies relationship of Gehman panel, called Columbia Accident Investigation Board. Says it is "independent" and will investigate all possible causes.
Late February 2003	O'Keefe and Gehman clash in a dispute over NASA personnel assigned to help Gehman and, indirectly, the "independence" issue.
March–April 2003	CAIB gradually expands its inquiry beyond technical causes to managerial issues.
May–early June 2003	CAIB conducts tests and determines "the foam did it." Foam debris from external tank ruptured a shuttle wing and allowed deadly overheating when the shuttle re-entered Earth's atmosphere.
Late June–July 2003	O'Keefe initiates management shake-up, says NASA will abide unequivocally with CAIB report.
August 26, 2003	CAIB delivers report; it harshly criticizes NASA management and cultural practices where safety is concerned.
September 2003	Congressional inquiry notes CAIB finds O'Keefe indirectly responsible for "schedule pressure." However, O'Keefe is not held responsible for accident. O'Keefe refuses to identify NASA officials he is holding accountable lest there be "a public hanging." Gehman backs O'Keefe; the causes are systemic, he says, and go back many years.
October–November 2003	O'Keefe steps up pace, intensity, and level of ongoing interagency discussions on a post-*Columbia* goal for NASA.
December 19, 2003	Bush decides on a new, bold direction for NASA.
	Period Three: O'Keefe as Steward of the President's Vision
January 14, 2004	Bush announces "space exploration vision"—to the moon, Mars, and beyond.
January 15, 2004	O'Keefe takes immediate steps to implement the vision, including establishment of major new directorate, Exploration Systems.
	The *Washington Post* reports that O'Keefe has cancelled a scheduled shuttle servicing mission to keep the Hubble Space Telescope operating.
March 10, 2004	Gehman, in a "second opinion" on shuttle servicing of Hubble, calls for a "deep and rich study of the entire gain/risk equation."
June 1, 2004	The Aldridge Commission, a presidential panel to study how to implement the space exploration vision, calls for a long-term strategy and transformation at NASA.
November 22, 2004	Congress appropriates $16.2 billion to NASA, virtually all that it requested, to help "jump-start" the exploration vision.
December 8, 2004	A National Academy of Sciences panel chartered to advise on Hubble rebuffs O'Keefe, saying a robotic mission would not be ready in time to keep Hubble operating and a shuttle mission is preferred.
December 13, 2004	O'Keefe writes Bush that he is resigning. Soon after, he accepts the chancellorship of Louisiana State University, effective February 2005.
January 21, 2005	The proposed Bush budget for NASA the ensuing fiscal year is announced at $16.45 billion—a raise when few agencies get increases, but not as much as O'Keefe had sought. No funds are included to keep Hubble alive.
February 11, 2005	O'Keefe departs for LSU. His deputy administrator, Fred Gregory, takes over on an interim basis.
March 14, 2005	The White House announces that Michael Griffin will be O'Keefe's successor.

Sean O'Keefe was a man who was familiar with public administration theory as well as practice, an avowed admirer of Webb. Possessing a graduate degree in public administration and exceptional executive experience in government, O'Keefe was appointed to lead NASA because he was an able manager steeped in financial expertise. NASA got top grades for technical excellence in building the space station and, in the view of the Bush White House and Congress, failing grades on the financial management of the station. O'Keefe, coming from the job of deputy director of the Office of Management and Budget, was a perfect match for that situation in the view of many observers. In his first year at NASA's helm, circumstances went well for O'Keefe and he felt the wind at his back.

Then came *Columbia* early in his second year as NASA's chief executive. The situation changed abruptly for the worse. No one truly is prepared for a national disaster like a shuttle failure. O'Keefe called it personally "withering." He told one writer, at a time when events seemed out of his control, that it was taking everything he had ever learned, in reading or practice, to deal with the situation he faced. O'Keefe had to change, and NASA had to change. The wind pressed against him and his agency. To his great credit, he got NASA through a turbulent and terrible time.

Then came an unanticipated opportunity to make headway, to point NASA in a new direction for which space enthusiasts had long yearned. For a brief moment, the environment grew receptive to a bold move. Out of the tragedy of *Columbia* arose a sense on the part of the president and many in Congress and the media that astronauts should risk their lives for a purpose larger and nobler than orbiting around the Earth. NASA was about exploration into deeper space, and that destiny had to be proclaimed unambiguously. Again, O'Keefe adjusted, this time to opportunity. He became the steward of President Bush's vision to go to the moon, Mars, and beyond. The financial consolidator and incremental innovator of 2002 gave way to a transforming executive in 2004. In between, he faced his greatest test—that of crisis manager. Had he not performed well in the situation he had in year two, he would not have achieved the Bush vision in year three. Even as he proclaimed that vision, he fought opponents of his decision to terminate a servicing mission to Hubble. A premature leak of that decision put him on the defensive when he wanted to be fully engaged as the president's champion, clearly his priority in year three.

The turbulence O'Keefe endured in his tenure was unusually intense and dramatic, but it is not unusual. Every executive faces changing situations. Sometimes "the law of the situation"—what he or she must do—is clear. Other times it is uncertain, and the executive copes to give it meaning for himself, his organization, and the public-at-large. For a while, there may be stability between organization and environment, but that equilibrium can be destroyed in an instant, as it was for O'Keefe at the time of *Columbia*.

Readers will judge for themselves how O'Keefe fared as NASA executive in his three years. His critics are many, as are his supporters. In various ways there were not only three major situations he faced, but there were three faces to Sean O'Keefe in dealing with those situations. The central lesson of his experience, for others who would aspire to lead, is to be as prepared as possible for the unexpected.

Abbreviations and Acronyms

ASAP	NASA's Aerospace Safety Advisory Panel
CAIB	Columbia Accident Investigation Board
CEV	Crew Exploration Vehicle
FEMA	Federal Emergency Management Agency
ISS	International Space Station
ISTP	Integrated Space Transportation Plan
NAS	National Academy of Sciences
NASA	National Aeronautics and Space Administration
NSC	National Security Council
OMB	Office of Management and Budget
OSP	Orbital Space Plane
RTF	Return to Flight
SLI	Space Launch Initiative

Management Lessons Learned from O'Keefe's Tenure as NASA Administrator

Lessons from Period One: O'Keefe as Consolidator and Incremental Innovator

1. Mitigate the immediate problem, but monitor the solution over time.
2. Communicate a vision.
3. Deal with the next worst problem.

Lessons from Period Two: O'Keefe as Crisis Manager

1. Take charge of crisis—be decisive, open, and consistent.
2. Develop a close but visibly independent relationship with investigators.
3. Hold individuals accountable but reject a "public hanging."
4. Embrace the investigators' report, but don't close off options.
5. Use crisis to leverage transformative change.

Lessons from Period Three: O'Keefe as Steward of the President's Vision

1. Get a presidential policy off to a fast start.
2. Avoid distractions.
3. Emphasize safety, have a contingency plan, communicate to the public the risks of space.

In *The Prince,* written in 1513, Niccolo Machiavelli advised the prince to be alert to changing "fortune."[3] Sometimes, fortune would smile and other times frown. In either event, the leader had to discern the options and make the best choice possible to retain and use his power effectively. While most readers today would not favor some of Machiavelli's methods, all would probably agree with his point about fortune. There will occur for most executives shifting circumstances, many beyond any leader's full control.[4] Sometimes they will win and sometimes they will lose in their contest with fortune. But they must anticipate change and be forceful in meeting the tests that come their way. To do otherwise is to surely lose.

The Executive as Consolidator and Incremental Innovator: O'Keefe in 2002

Introduction

It was a joyous occasion. On February 1, 2003, Sean O'Keefe, administrator of NASA, stood on the reviewing platform of the Kennedy Space Center in Florida.[5] He, NASA officials, and the families of astronauts on board Space Shuttle *Columbia* eagerly awaited the landing of the spacecraft, thereby completing a successful scientific mission. O'Keefe had been in office a little more than a year and was getting good reviews for his start in restoring the financial credibility of NASA. In just three days, he would announce NASA's budget request to Congress for the ensuing fiscal year. Approved by the president, it would reflect a raise and a number of new initiatives. He would be able to say a $4.8 billion space station financial crisis he inherited was under control, and NASA could boldly look forward again, heralded by starting on a new launch vehicle, the Orbital Space Plane (OSP). The OSP would take some of the burden off the aging space shuttle and serve as a rescue vehicle from the space station.[6]

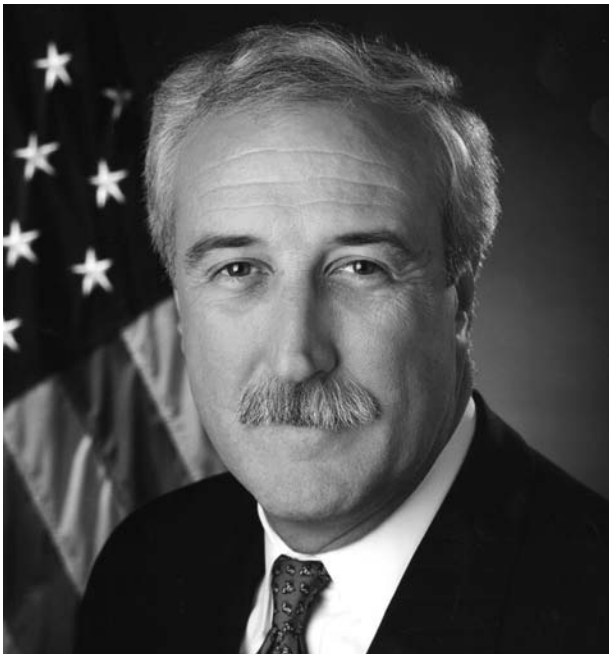
But then, Bill Readdy, associate administrator for space flight, came up to him, his face ashen. "Something was wrong," Readdy exclaimed. "We've lost communication." A few moments later the truth was painfully evident: *Columbia* did not arrive; it was lost, along with its crew of seven.[7] In a moment in time, O'Keefe, hired for his financial expertise, had to become leader in a crisis of national, indeed global, significance. *Columbia*'s disintegration—an unanticipated, awful event—was the defining instant in O'Keefe's tumultuous three-year tour as NASA's administrator. Who was Sean O'Keefe? How did he happen to be NASA administrator? What did he do as NASA's leader before *Columbia?* How did he respond to *Columbia* and the investigation that followed? How did he guide NASA's recovery?

The O'Keefe era is in fact three periods. The first period, from O'Keefe's confirmation in December 2001 to February 1, 2003, was dominated by the space station financial problem. The second, from February 1, 2003 to January 14, 2004, was all about *Columbia*—the event, the investigations, and the using of *Columbia* as impetus for a presidential decision. The third, from January 14, 2004 until February 11, 2005, when O'Keefe left, emphasized transformation based around the new exploration vision expounded by Bush in January. O'Keefe had to sell the vision and begin remaking NASA for its implementation. The third era was also complicated by a controversy involving the Hubble telescope. The eras embraced three different years, with *Columbia* precipitating change not only in NASA but also in O'Keefe.

O'Keefe: Background

O'Keefe was not a rocket scientist. "I am a public administrator," he would tell people, meaning a generalist manager of public organizations. Forty-five at the time of his appointment in December 2001, O'Keefe had been born in Monterey, California, the son of a naval officer, a nuclear submariner. After a bachelor's degree from Loyola University in New Orleans, O'Keefe went to the Maxwell School of Syracuse University, where he earned a Master of Public Administration degree in 1978. Awarded a Presidential Management Internship, he began his Washington career as a budget analyst for the Department of Defense. During the 1980s, he served on the staff of the Senate Appropriations Committee. There he got to know many influential lawmakers, including then-Representative Dick Cheney, Republican from Wyoming. Cheney saw in O'Keefe a bright, competent, hard-working, and loyal man, with a knack for financial matters.

NASA/KSC



Sean O'Keefe

When President George H. W. Bush became president in 1989, he appointed Cheney his secretary of defense. Cheney selected O'Keefe to be comptroller and chief financial officer of the Pentagon. In 1992, when a sexual harassment scandal known as Tailhook rocked the Navy, Cheney turned to O'Keefe. Appointed secretary of the Navy, O'Keefe showed he was much more than a financial manager. He dealt swiftly and firmly with the Tailhook incident and set the Navy on a course for recovery.[8] He left Washington in 1993, when Bill Clinton became president. During the Clinton years, O'Keefe worked in the university world, first at Pennsylvania State University and then at his alma mater, the Maxwell School, where he held an endowed chair in public administration and directed the school's National Security Program. When George W. Bush became president in 2001, and Cheney vice president, Cheney called O'Keefe back to Washington as deputy director of the Office of Management and Budget (OMB). It was a perfect match of man and position.

The International Space Station (ISS)

No sooner in office in late January, O'Keefe faced a huge challenge. NASA told the new administration that its flagship project, the International Space Station, had a prospective $4 billion overrun. The news had seemingly come out of the blue. The administration was shocked and distrustful of NASA's administrator, Dan Goldin, who was temporarily held over from the Clinton administration. After testifying before Congress on the $4 billion overrun, O'Keefe was informed by NASA that the overrun would be higher, eventually soaring to $4.8 billion. Upset, O'Keefe forced Goldin to appoint an independent panel headed by Tom Young, a retired aerospace executive, to investigate the nature of the problem and what might be done about it. Meanwhile, OMB terminated three major ISS technology development projects and reduced the number of yearly shuttle flights to the station for construction—all moves to save money.[9]

The Young panel determined NASA's financial management system was not credible and needed overhaul. It endorsed the OMB-directed cutbacks and said NASA should be put on "probation" for two years to see if it could get space station costs under control. If it could, space station assembly would resume as originally scheduled.[10]

The space station that existed when O'Keefe came into office was essentially a U.S.-Russian station. It orbited with three astronauts. The plan was to add additional U.S. modules and then complete the outpost with components from Europe, Japan, and the other international partners. There were 16 nations involved in this, the largest international science and technology project in history. What OMB had proposed and the Young panel endorsed was an explicit new stage in the project called "U.S. Core Complete." This was the de facto probationary period when the United States would add components to make it possible for the other nations to attach their modules. The end of U.S. Core Complete would come when a component called Node 2 was assembled. Since time was money and the ISS was well behind schedule, it was desirable to "complete" U.S. Core Complete with some dispatch. O'Keefe, drawing on NASA's planning, set February 2004 as the deadline. The Bush administration adopted the U.S. Core Complete strategy as its policy. It was up to NASA to show it could achieve U.S. Core Complete on time and on budget to regain credibility.[11]

When the Young report was delivered at the beginning of November, Goldin had already announced

that he would depart before Thanksgiving. The administration looked in vain for a successor outside government. Cheney, to whom Bush had delegated the space portfolio, was getting frustrated. Was there anyone already in the administration who was qualified to deal with NASA and specifically its financial challenge?

Appointment to NASA

"We've got another job for you," Cheney told O'Keefe one morning in mid-November. "If the president asks you [to run NASA], you are not in a position to say no." Later that day, O'Keefe attended a meeting with others in the Oval Office. At the conclusion of the meeting, which had nothing to do with space, Bush came over to O'Keefe and said, "Thanks for taking the NASA job." Still somewhat stunned, O'Keefe informed his wife and three young children that evening of the "offer." They were quizzical. His son exclaimed: "Hey dad, [we] thought you had to be smart to run NASA."[12]

On November 14, 2001, the White House announced the O'Keefe appointment. The Senate confirmed him as administrator December 21. His first day on the job was January 2, 2002.[13]

A Year of Quiet Change

Many in Congress and the media saw O'Keefe as a good match for NASA's need to get its fiscal house in order. Space enthusiasts in Congress and elsewhere worried that he was a narrow "bean counter" oblivious to the glory of space. Without question, O'Keefe was hired to fix the space station overrun, and he gave immediate attention in his first months to bringing new managers aboard, assessing the NASA accounting system, and ordering independent audits.

However, he was much more than a bean counter. He knew the history of NASA, was honored to be its leader, and wanted to reinvigorate an agency that had lots of problems beyond the space station. He quickly, but quietly, began pulling power up to himself and NASA headquarters, particularly from Houston's Johnson Space Center, which had strongly managed the station and shuttle in the 1990s. In doing so, he replaced NASA managers he inherited from Goldin with individuals closer to his views. Soon he had his team in place, some of whom had served him at OMB.[14]

Vision

After a few months in office, with the space station getting on track, O'Keefe felt ready to make his broader policies clear. Those views became known when he gave his first major "vision" speech April 12. He chose a comfortable venue: the Maxwell School of Syracuse University. With central New York Congressmen James Walsh and Sherwood Boehlert looking on, he gave a speech that contained no dramatic goal such as a trip to the moon or Mars. While NASA would explore, it would be *science* that would drive its quest. "NASA," he declared, "will go where the science dictates that we go, not because it's close or popular." Science would determine pace and direction, and the priorities of manned versus robotic spaceflight.[15]

What O'Keefe was seeking was a clear rationale for NASA. He was also countering the tendency of enthusiasts to see space in "manifest destiny" terms—to go for the sake of going because "it's there"—pursuing manned exploration in particular. His OMB/budgetary background made him ask: Why? With the competition of the Cold War now history, why spend billions on space technology in the 21st century? What rationale made sense? O'Keefe said it was the pursuit of science.

Moreover, the O'Keefe vision wanted NASA to return to its "roots," by which he meant developing new capabilities through research and development. The United States and other nations were still wedded to Apollo-era technology for power and propulsion, he pointed out. He proposed nuclear power as the technology that could take NASA into space faster, farther, and for longer duration. His vision emphasized developing new capabilities, and he clearly eschewed proclaiming a goal to a specific destination.[16]

The emphasis on capabilities included human capabilities. NASA had to do its part to attract the best and brightest to technical fields, including that of space, where the workforce was aging. O'Keefe was deeply interested in education, and he believed he could rekindle popular enthusiasm by reviving the "teacher in space" program, dormant since the *Challenger* disaster. He announced that Barbara Morgan, who had been waiting patiently since 1986, would be the first of a series of educator-astronauts, and she would go up in the shuttle in 2004.[17]

"I am encouraged by what I heard," stated Boehlert, House Science Committee chairman, referring to the O'Keefe vision. Rep. Tom DeLay, the powerful Republican majority whip from Texas, however, had the opposite view. He reproached O'Keefe for his lack of bold vision, calling his bean-counter approach to space "timid, anemic."[18]

Moving Ahead

O'Keefe moved ahead with his strategic vision. He spoke of "one NASA," by which he meant an effort to get headquarters and centers to think about the whole rather than the parts of the organization. This meant moving managers around to centers other than their "homes." It meant a common website. Perhaps most importantly, it meant seeking to combine various separate accounting systems into a single accounting system—a huge shift.

Aside from these strictly managerial changes, O'Keefe looked to program innovation. The program that best epitomized the O'Keefe capability approach came to be called Prometheus, the nuclear propulsion R&D program that would open up the solar system for less constrained exploration. He recognized the potential opposition to space nuclear propulsion in the future and emphasized the need for public support as technological development proceeded. Also, to show he was serious about science-driven requirements, he established a science advisory committee to determine priorities for the space station.[19] The future configuration of the station should reflect science use, he asserted, rather than engineering convenience. In July, the advisory group provided science priorities, but told him they could not be realized with the U.S. Core Complete system. Three astronauts were not enough. With a fully assembled station, there could be six or seven passengers.[20]

The current number was determined by rescue capability. Until a crew rescue vehicle was developed, the United States and other partners were dependent on the Russians and their *Soyuz*. *Soyuz* could accommodate only three people. Dependency on the Russians was not a good long-term strategy, O'Keefe knew.

By late summer, early fall, O'Keefe's financial managers and independent analysts were saying that the agency's capacities for estimating expenses and managing them were improving. O'Keefe himself was saying that space station costs were coming under control. He felt NASA was turning the corner on its financial problems and regaining credibility with Congress and others. It was now possible to deal with a number of unresolved issues, including that of crew rescue.

The biggest issue was the shuttle. Although it was performing well in delivering components to move the station toward its U.S. Core Complete end state, it was getting older and needed upgrades. But which upgrades and how many? In the 1990s, NASA had invested $1 billion to develop the prototype of a potential shuttle successor, the X-33, that O'Keefe's predecessor, Goldin, cancelled when it ran into serious technical and financial barriers. However, because a new vehicle was then seen as in development, various shuttle upgrades were postponed. Goldin had replaced X-33 with a Space Launch Initiative (SLI), a program O'Keefe characterized as "let a thousand flowers bloom." O'Keefe decided it was important to choose an interim system to take pressure off the shuttle for launches, while investing in long-term R&D for an eventual shuttle successor. The interim system would also provide crew rescue and thus enable the station to reach its full complement of personnel. Finishing the space station, bringing the other international partners aboard, seemed essential for science goals, and that was the direction O'Keefe wanted to go.

In early November, O'Keefe used an artful strategy to get NASA moving forward again. He got the president to sign off on an amendment to the NASA budget Congress was then considering but had not passed. This amendment, eventually approved by Congress, increased funding for shuttle upgrades. His aim was to accelerate upgrades and extend the shuttle's life to 2020.

The shuttle upgrades were the first step in what he called the Integrated Space Transportation Plan (ISTP). The other components, which would be featured in the succeeding NASA budget, were the Orbital Space Plane and a joint long-range R&D program with the Department of Defense to develop a true shuttle successor after 2020. The OSP would be a complement to the shuttle in transporting people and cargo to and from the station. It would help prolong the shuttle's life, provide the rescue capability for a six- or seven-astronaut station, and enhance safety overall.[21]

The November amendment got ISTP started. The big push, featuring OSP, would come in the next NASA budget, which the president would announce in early February 2003. ISTP was part of a long-range strategic plan O'Keefe would unveil along with the new budget. The strategic plan would emphasize a stepping-stone approach to exploration. NASA was still about developing capability, not pushing specific destinations, but the discussion of exploration indicated O'Keefe shared the view of many visionaries that NASA had to move beyond low Earth orbit, the space station's location.[22] The difference lay in O'Keefe's emphasis on science, not destination, as a driver.

As 2002 ended and 2003 began, O'Keefe felt he had not only turned the corner in space station financial management, but also was giving NASA a realistic vision that would be financially feasible and would give it direction for years. There was a general feeling in Washington that NASA was on the right track and had a competent, if not flashy, manager in charge. O'Keefe's low-key manner and incremental approach seemed to fit the times—when the country was absorbed with the war on terrorism and soaring budget deficits. Space was not a priority for the White House, much less Congress.

On Saturday morning, February 1, 2003, O'Keefe and his top leadership were feeling good as they awaited the landing of Space Shuttle *Columbia*. Not only was the landing a time of celebration, but also they looked forward to Tuesday, February 4. On that day, the NASA FY 2004 budget would be officially announced, with an increase, and they could say to the world the space station's financial problems were largely behind and they had a strategy for the future. That strategy entailed exploration, but in O'Keefe's quiet, incremental way.[23]

Management Lessons Learned from Period One

1. Mitigate the Immediate Problem, but Monitor the Solution Over Time

Sean O'Keefe was appointed to NASA as "Mr. Fix-it." What he was to fix was the space station cost overrun—and NASA credibility—problems. The chief methods included: (1) cutting back on hardware components or, at least, delaying their development; (2) installing a more robust financial accounting system to track costs; (3) pulling power up to headquarters from Johnson Space Center and putting a new team of officials in key program and staff jobs who would give weight to management equal to that of engineering excellence. The fourth and most important approach was to employ a "probationary" period, called U.S. Core Complete, during which NASA would demonstrate an ability to perform on time and within budget. This period—roughly the time period between when the U.S.-Russian core was assembled and European and Japanese components added—was devised by the White House and NASA prior to O'Keefe's becoming administrator. It included the United States providing certain components to make European-Japanese linkages possible. As deputy director of OMB, O'Keefe played a major role in devising the U.S. Core Complete strategy. Now it was up to him to implement the policy at NASA.

The problems with the strategy came to light later, when the Columbia Accident Investigation Board (CAIB) accused O'Keefe of "schedule pressure" via U.S. Core Complete. Top management (O'Keefe) was accused of being insensitive to the stress on employees in mounting the heavy sequence of shuttle flights necessary to meet the Core Complete space station deadline. The strategy was not necessarily wrong—indeed it seemed essential at the time to repair the credibility of NASA and get the space station assembly back on track. What O'Keefe and others at the top needed was a better feedback system to monitor the impact of the station cost/schedule/credibility strategy. Without adequate feedback, allowing leaders to communicate a flexibility they in fact were willing to grant, the solution became a problem.

2. Communicate a Vision

Once he had set in motion reforms to deal with the station overrun, O'Keefe provided a larger "vision" of where he wished to direct NASA. In an April 2002 speech at Syracuse University, widely covered by the media, O'Keefe announced that "NASA's mission … must be driven by the science, not by destination." O'Keefe eschewed a manifest destiny declaration and moon-Mars goals. Wherever science dictated, NASA would go, and he pledged a "stepping-stone approach" to get there. Historically,

the unmanned science and human spaceflight efforts were organized separately and competed for priority and funds. Now, he said, they would work in harmony, with one helping the other. This pattern would lead to synergy and "on the bean counting side" would more efficiently use resources.

O'Keefe also stressed the need to use NASA to inspire youth. He emphasized his desire to augment human capital and get more young people into technical fields. Toward that end—in what was the most widely reported item—he revived the teacher-in-space program, and announced he was giving education unprecedented organizational status at NASA. More controversially, he also said NASA would develop space nuclear propulsion for its future.

Space activists wanted a bolder speech that included "destinations." But O'Keefe wanted NASA to be realistic about its goals, "get back to basics," and emphasize NASA's R&D roots. He did what he had to do—set a direction and assert his values. Space enthusiasts did not like what they heard, but they knew where O'Keefe stood, and that was important to convey in his "vision" address.

3. Deal with the Next Worst Problem

O'Keefe's vision represented the longer-term macro approach. He had to deal also with an ongoing stream of serious program issues. If ISS was the number one problem he inherited, the shuttle was the second. His predecessor, Dan Goldin, had unsuccessfully spent $1 billion to develop the prototype of a shuttle successor, the X-33. When the X-33 failed, Goldin launched the Space Launch Initiative with multiple approaches. Meanwhile, the question about how long the shuttle would continue went unanswered. The longer shuttle decisions were postponed, the greater (and more expensive) could be the upgrades. Late in 2002, O'Keefe made known the Integrated Space Transportation Plan. This entailed the development of the Orbital Space Plane to complement (and take some of the load off) the shuttle in assembling and servicing the ISS, as well as providing a crew rescue capability. The plan required significant upgrades to keep the shuttle flying until a designated date: 2020. In addition, the plan called for NASA's working with the Department of Defense to design a true shuttle replacement.

The Integrated Space Transportation Plan replaced what O'Keefe called the "let a thousand flowers bloom" approach that he had inherited. He thus ended perceived drift on the shuttle front. He simultaneously conveyed the image of a careful, competent, consolidating manager. His vision of synergy between manned and unmanned programs in pursuit of science goals came across as efficient as well as effective. His shuttle policy used the word *integrated*. Such words communicated the O'Keefe approach. He was tackling the top NASA challenges in a solid and money-conscious way. Given his political setting—a president and Congress preoccupied with the war on terrorism and soaring budget deficits—his style fit the times.

The Executive as Crisis Manager: O'Keefe in 2003

Columbia: A Transforming Event

At 9:05 a.m., O'Keefe stood in the reviewing stand at the Kennedy Space Center. In 10 minutes, Space Shuttle *Columbia* was scheduled to land, and he, the families of the astronauts, and other officials and visitors waited for a joyous moment of triumph. At that instant, Bill Readdy, associate administrator for space flight, moved toward him, his face showing alarm. "Something was wrong," he exclaimed. "We've lost communication." He continued, "This is not right, something is not right on this." At 9:10 a.m., Readdy told him: "We should have heard the sonic booms by now." Readdy was a veteran shuttle commander and former fighter pilot, and O'Keefe observed he was trembling.[24]

O'Keefe was stunned and later recalled his feelings: "It was just one of those hit-you-with-a-mackerel kind of moments. You know 'Good God Almighty.' You see someone like him sitting there doing that, and he knows the gravity of it better than anybody. It was enough to make you just start shaking right down to the edge."[25]

On his first day as administrator, O'Keefe had reviewed the contingency plan for a shuttle accident, largely written in the wake of *Challenger*, the 1986 shuttle disaster. He asked that its public relations aspect be strengthened in view of the growth in media attention since then. He even ordered a simulation to practice NASA's response "just in case." Never once, however, did O'Keefe seriously believe a real disaster would occur on his watch. Now, his most dreadful imagining had arrived. He later called February 1, 2003, "the worst day of my life." But as he realized what was unfolding, he also knew he would be personally tested as never before.[26]

Readdy always carried a copy of NASA's contingency plan with him to every shuttle launch and landing. He now pulled it from his briefcase, and O'Keefe put it into action. O'Keefe first contacted the president, then at Camp David. After speaking with the president, O'Keefe called Tom Ridge, then-secretary of homeland security, and Stephen Hadley, the White House deputy national security advisor. They discussed whether terrorism was a cause, but dismissed this possibility given the altitude and speed of the shuttle when contact was lost. O'Keefe also conferred with the head of the Federal Emergency Management Agency (FEMA). Debris from the shuttle was strewn all over East Texas and part of Louisiana, according to initial reports. O'Keefe worried that someone might have been hit. Even if not, the debris could be dangerous and would be needed in an investigation. O'Keefe asked FEMA to take charge of debris collection and said NASA would assist in any way necessary.[27]

O'Keefe now visited with the families, who had been escorted to a room where they could grieve. The families heard from the president as well as the NASA administrator. In addition to words of comfort and empathy, both men pledged to find out what happened, fix whatever had gone wrong, and continue in space. The families, in spite of their sorrow, echoed their sentiment—continue![28]

The next task was to deal with the media and public. The accident was already the subject of nonstop coverage on all the TV networks and cable channels. Journalists clamored for information. From a television set at the Kennedy Control Center, where O'Keefe and NASA officials had gone, O'Keefe learned that someone at NASA had already scheduled a press conference at a time that was imminent: 11:00 a.m.[29]

Paul Pastorek, then NASA general counsel and O'Keefe confidant, who had come to watch the *Columbia* landing, stood with O'Keefe at the Control Center and urged him to wait. He declared: "We're not holding any press conferences until we know what we are going to say—and who's going to say it." The word went out that there would be a delay in the press conference and O'Keefe would speak later that day.[30]

A key issue that had to be settled and clarified at the press conference was the nature of the accident investigation. NASA's contingency plan called for the agency to set up a review board. Certain key positions and skills in accident investigation would be represented, drawn from other agencies as well as NASA. Fred Gregory, NASA deputy administrator, was in Washington and already at work, calling people who fit the position profiles to form this body. Bush had given O'Keefe no indication that he would favor an independent presidential commission such as the one formed after *Challenger*. O'Keefe proceeded, therefore, on the assumption that NASA was in charge of setting one up. Moreover, he knew enough about the *Challenger* inquiry to know it had been slow in getting started and adversarial in manner. It was important to O'Keefe to get the inquiry started right away, in part because he was acutely conscious that the fate of the space station and its occupants was linked to the shuttle's return to flight.[31]

O'Keefe spoke by phone with Gregory, and suggested possible names for the panel, specifically the chair. O'Keefe had two men in mind, one of whom was Harold "Hal" Gehman. Gehman was a 60-year old retired admiral. He had masterfully led the investigation into the sinking of the vessel *Cole,* as a result of terrorist action in Yemen. O'Keefe was familiar with the *Cole* inquiry. He believed Gehman was eminently qualified to run an inquiry and not be a loose cannon. Gregory called both of the candidates O'Keefe mentioned. One was unavailable, but Gehman was willing to take on the job, agreeing that day.[32]

O'Keefe, Readdy, and Pastorek now discussed what O'Keefe would say at the press conference and NASA's general stance vis-à-vis the media. Pastorek said NASA could take a legalistic position and provide little or no comment. Or it could adopt a policy of full openness. Or NASA might find some approach in the middle. In debating the options, it was observed that NASA had taken the legalistic option after *Challenger* and had come across as secretive, having something to hide, which had hurt its public credibility. At the same time, it was pointed out that full openness would lead to some statements made, or documents issued, that would embarrass the agency, or worse.[33]

Readdy declared: "I think we should take the approach that my father taught me, and that's to tell the truth, tell it all, and tell it now." O'Keefe agreed, noting: "The truth doesn't get any better with age." He decided NASA should be as open as possible and openness would help more than it could hurt. Only information about the remains of the astronauts and their disposition would be off limits.[34] As for the press conference, the NASA leaders decided that O'Keefe would speak first on behalf of NASA, then Readdy. The director of the shuttle program at Houston, Ron Dittemore, would subsequently give daily updates to the media on what was taking place and what was known. O'Keefe called Dittemore. He said Dittemore could say anything he wanted—except speculate on the cause of the disaster. He couldn't say: "I think this caused it," or "I think this didn't cause it." O'Keefe said that was the job of the investigating panel, not Dittemore's job. He instructed Dittemore to deal simply with the facts, lest the credibility and independence of the investigating panel be undermined.[35]

O'Keefe now spoke briefly with the president, bringing him up to date. They agreed that O'Keefe would go on TV at 1 p.m., with Bush flying from Camp David back to the White House to address the nation at 2 p.m. When the time came for O'Keefe to speak, all the nation's networks switched to him. O'Keefe expressed his sadness for this "tragic day."[36] He stated that both he and the president had spoken to the families, and the government had already begun the search to recover their loved ones and understand the cause of this tragedy. He announced an accident investigation panel had been established and would soon go to work. He said that there was no evidence of terrorism, and people should help in locating shuttle debris, but not handle it themselves. He then turned the platform over to Readdy, who made it clear NASA did not know what caused the accident and the investigation panel would deal with that issue. Until the cause was known and dealt with, he was grounding the shuttle fleet.

Soon, Bush was on television, saying the event had "brought terrible news and great sadness to the country." Praising the astronauts, each by name, the president offered comfort to the families and country, and declared: "The cause in which they died will continue…. Our journey into space will go on."[37]

That afternoon, O'Keefe flew back to Washington on the NASA jet. During the trip, Readdy offered his resignation to O'Keefe. "This happened on my watch," he said. He had overall responsibility for spaceflight. "I am prepared to resign right now." O'Keefe responded: "Not accepted. We are going to have to [work] our way through this together, buddy."[38] Also during the trip, O'Keefe went over to Pastorek and said: "If we do not do this right, we could lose human spaceflight for good." The plane arrived at Reagan National Airport in the late afternoon, and O'Keefe and his associates went to NASA headquarters for a 5 p.m. teleconference with Gehman and subsequent meetings.[39]

That Sunday, February 2, Gehman met informally with those of the investigation panel who arrived early at their initial site at Barksdale Air Force Base, near Shreveport, Louisiana. NASA Deputy Administrator Gregory attended and told them NASA was actively resisting "the push for a presidentially appointed or congressionally appointed commission" like the one that investigated *Challenger*. However, White House interest was high, as was that of Congress. Lawmakers, he said, would be supportive of the Gehman panel unless it "screwed up."[40]

Bush Says 'You're In Charge'

The next day, Monday, O'Keefe and Pastorek went to the White House to meet with Bush and his aides. The key issue was settling the question of who was in charge of the investigation. A chorus from the media and Congress was calling for a presidential commission as the only way to ensure independence. Pastorek said to the president: "I came to this job to help Sean deal with correcting the financial problems of the agency. Now he has to deal with this kind of crisis." Bush responded: "Anybody can do that—deal with a financial problem. Only a true leader can right the ship at a time like this."[41]

While they were speaking with the president, Bush's press secretary, Ari Fleischer, said: "I am going to be asked at today's press conference about the *Columbia* accident. This is what I thought I should say, and I wanted you, Mr. President, to let me know if this is appropriate." The president interrupted Fleischer: "Tell the press: 'Sean O'Keefe is responsible for answering those questions.'" Then he looked at O'Keefe and stated firmly: "You're in charge; take care of it."[42]

Dittemore Slips

O'Keefe was "in charge," but what did that mean in reality? It was obvious that this first week was critical in winning public support for the agency. It was a time of mourning for O'Keefe and others, with one memorial service after another in various locations. However, O'Keefe also appeared frequently on TV news programs in the first week, expressing his seriousness about getting to the bottom of the accident and moving NASA back into space in honoring the fallen astronauts. Just giving NASA a human face was critical at this time. The NASA administrator showed openness and sadness, but also resolve. He came across as calm, steady, candid, and determined. His outward steel helped NASA morale. Inwardly, he was in agony, but he reminded himself that as much as he was hurting, the families were suffering much more. He was also drawing on everything he knew—in theory, practice, or instinct—about leading in a crisis setting.

At the same time in Houston, Dittemore was also putting NASA in a good light with his daily briefings. He said what NASA knew and did not know, and followed O'Keefe's admonition not to speculate on causes. Commentators contrasted favorably NASA's open approach with the closed strategy after *Challenger*.

Then, on February 5, Wednesday, Dittemore slipped. He was asked by a journalist about the theory that insulating foam had shredded from the shuttle's external tank and hit the shuttle in a vulnerable part of a wing. This had possibly caused a rupture that led to deadly overheating when the shuttle re-entered the atmosphere. Photographs showed foam debris hitting the shuttle not long after launch. Dittemore responded: "We believe there's something else…. Right now, it does not make sense to us that a piece of debris would be the root cause for the loss of *Columbia* and its crew. There's got to be another reason." At the time, O'Keefe was struggling to convince skeptics of the independence and

credibility of the accident investigation. He had been told by NASA specialists that foam could not have done damage as great as to cause *Columbia*'s demise. It was simply too light. But that didn't matter. Dittemore had gone over the line O'Keefe had drawn. O'Keefe had ordered him not to speculate on causes, and here he was speculating. O'Keefe hit the roof![43]

On Thursday, a chastened Dittemore tried to set the record straight. "As I talked to you yesterday, I mentioned to you that we believe in some instances that it's hard for us to understand why a block of foam that has fallen off the tank could have been the right cause. But that is not stopping us from continuing to investigate that particular event as being a potential cause."[44] On Friday, O'Keefe felt obliged to say NASA was not wedded to any theory of causation and would explore all possibilities, no matter how remote. He again emphasized: CAIB would decide what the cause was.[45]

CAIB Takes Over

Meanwhile, during the first week after the accident, Gehman had been getting his panel together and reviewing documents related to the accident. His first action was to give the panel a new name—from International Space Station and Space Shuttle Mishap Interagency Investigations Board to Columbia Accident Investigation Board, or CAIB.

The board had six initial members, all experts in aerospace safety and aviation crash investigations: Rear Admiral Stephen Turcotte, commander of the U.S. Naval Safety Center in Norfolk; Major General Kenneth Hess, chief of safety, Kirtland Air Force Base; James Hallock, chief of the Aviation Safety Division at the U.S. Department of Transportation in Cambridge, Massachusetts; Steven Wallace, director of accident investigations for the Federal Aviation Administration in Washington, D.C.; Brigadier General Duane Deal, commander of 21st Space Wing, Patterson Air Force Base, Colorado; and Scott Hubbard, director of NASA Ames Research Center (who had led NASA's redesign effort following the 1999 failures of two Mars probes).

At one of its first meetings, on February 3, the board discussed the issue of "independence." It decided it needed its own administrative staff and technical experts. Also, as Gehman recalled: "I knew that independence, autonomy from NASA, was going to be an issue. There was a draft charter that was faxed to me … and right away there were some things in the draft charter that I knew I couldn't live with. It said to do things that the NASA administrator says and clear all your activities through the NASA administrator." Gehman communicated his concerns to O'Keefe and got O'Keefe to make the changes he wanted.[46]

Also, the board quickly ascertained that most of what it needed to know had answers at Johnson Space Center in Houston. Johnson Space Center had had management control over shuttle most of the time in recent years. So, on Wednesday, February 5, CAIB flew from Barksdale to Houston and established an office a mile from the space center.[47] By the end of the week, Gehman felt CAIB was sufficiently organized that it could fully take over the investigation and replace Dittemore in giving briefings to the public. Told February 7 he no longer had to do the briefings, Dittemore responded: "Thank goodness. Yahoo!"[48]

O'Keefe and Gehman

O'Keefe and Gehman were respectful and cordial—it was "Sean" and "Hal." But there was inevitable tension in the relationship owing to Gehman's determination not to be seen as a tool of NASA and O'Keefe's desire to keep CAIB focused on finding out what went wrong quickly. Gehman emphasized thoroughness. O'Keefe wanted that *and* speed. Cognizant of the "independence" issue, O'Keefe granted much that Gehman wanted in order to show independence and to head off continuing pressures for an even more "independent" body.[49]

In addition to changing CAIB's charter to grant it more autonomy, he went along with Gehman's desire to add more "public" members to CAIB's panel. Eventually, CAIB numbered 13, including Sally Ride, the first female astronaut, now a professor at the University of California, San Diego, who had been a member of the Rogers Commission that investigated *Challenger*. The new members brought different skills, including knowledge about NASA's history and organizational culture. Gehman made it clear he wanted to get at the root causes of the disaster, and, as time went on, he came to believe the organizational issues were as important as the technical.

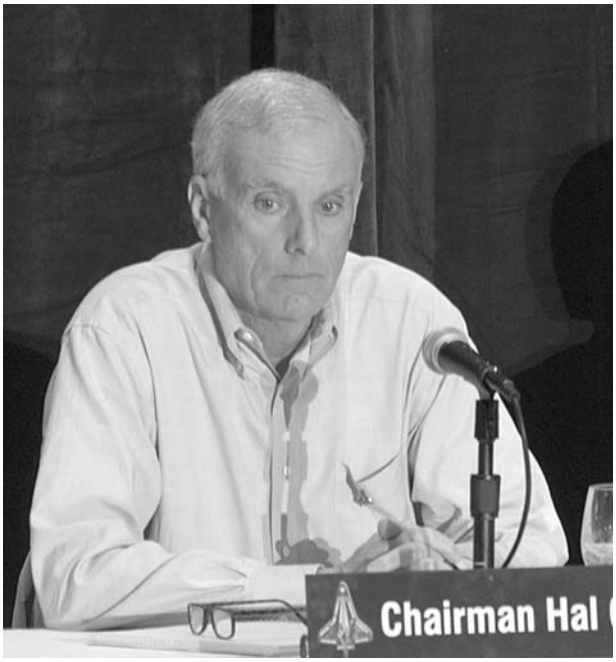
In his first public briefing, the second week of February, Gehman issued his "declaration of independence," stating:

> The administrator of NASA signed the letter creating this board, and his street address will be on the envelope of the outside of the report. But this board is aware that we have many constituents. We are fully aware that the families of the deceased astronauts are our constituents. We are aware that the Congress of the United States is one of our constituents. The White House, the taxpayers, and citizens of this country are all constituents of this board … ours is going to be a deep and thorough investigation. We're going to find the causes and make recommendations.[50]

Gehman meant what he said. However, while he and the board wanted to keep their distance from NASA, they also wanted the agency to correct problems in the interest of safety and getting back into space to resume work on the ISS. Gehman and O'Keefe agreed to maintain communication informally and non-publicly so NASA could fix problems and move forward rapidly. Hence, relationships were a delicate balancing act, and both O'Keefe and Gehman tried to keep their common interests in mind, since tensions were inevitable.[51]

As Gehman and his panel settled into a day-to-day routine, O'Keefe kept in touch with the families of the seven deceased astronauts. At the same time, he steered NASA's FY 2004 budget through Congress as best he could and made sure ISS, still orbiting the Earth, was secure. O'Keefe spoke with Yuri Koptev, Russia's space agency chief, the second week of February. Koptev said Russia would continue to provide crew rescue, as it had been doing via an unmanned *Soyuz*. The astronaut crew on board the station was in no immediate danger, but O'Keefe had to reduce the number from three to two to conserve food and other supplies in the absence of shuttle flights.

All the international partners (the European Space Agency, Japan, Canada, and Russia) said they would help NASA get through this crisis. All had linked their manned spaceflight futures to the space station.



NASA/KSC

Harold "Hal" Gehman, chairman of the Columbia Accident Investigation Board.

O'Keefe put the best face he could on NASA's predicament, keeping ISS up and occupied, and pressing ahead on all non-shuttle-related NASA programs.

O'Keefe continued to speak with the media, which was digging for its own explanation of what went wrong. In mid-February, O'Keefe criticized the burgeoning number of "foamologists," among other theorists.[52] Wait for CAIB to determine the cause, he pleaded. While O'Keefe's manner and openness won points with the media, he was learning that NASA's openness, as Pastorek warned, had a downside. By releasing photos and e-mails, NASA revealed that there was alarm on the part of various engineers about the debris strike and other safety matters after the shuttle launch. On February 27, O'Keefe had a particularly testy exchange at a hearing with Congressman Anthony Weiner (D-N.Y.) who wanted to know why O'Keefe didn't know about the early e-mail warnings. O'Keefe explained that such exchanges were not unusual and so plentiful that it was unrealistic to think he would be aware of everything going on in the agency. However, in hearings shortly afterward, he expressed dismay about his not being consulted on a decision by NASA officials not to request a photo survey by the Defense Department of possibly damaged heat-reflecting tiles. The e-mails were revealing possible flaws in NASA decision making.[53]

Clashing with Gehman

O'Keefe outwardly kept on good terms with Gehman. Whatever Gehman wanted, in terms of CAIB members, consultants, charter revisions, and money to support his investigation, he got. But O'Keefe was growing somewhat annoyed with Gehman's rhetoric about autonomy and some of his actions. O'Keefe was also, as NASA's leader, conscious of his agency's wounded morale and anxious to protect NASA against unwarranted attack. In late February, Gehman seemed—to O'Keefe—to go one step too far.

One morning, several board members came to Gehman and alerted him to a possible "shipwreck" coming. O'Keefe had established a special NASA group, the Mishap Investigation Team, to assist CAIB. The board members pointed out that some of those involved were decision makers during *Columbia*'s last flight. Linda Ham, who led the Mishap Team, was central to the investigation, and Gehman believed she was in a position "to filter inbound NASA reports." She and her associates close to the inquiry would have to be reassigned. These also included Ralph Roe, de facto director of the accident's engineering investigation efforts. Gehman met with Ham and Roe and explained they could not investigate themselves. They felt their integrity was being questioned and resisted.[54]

Gehman and O'Keefe privately discussed the reassignment and O'Keefe agreed to go along. He assumed, based on his conversation with Gehman, that the reassignment would be low profile. O'Keefe spoke to the managers as well as their superior, Dittemore. While there was unhappiness on the part of those to be reassigned, the decision was made as far as O'Keefe was concerned.

But when nothing happened for some time, Gehman decided to force the issue.[55] He sent a letter to O'Keefe, February 25, formally requesting that NASA "reassign the top-level space shuttle program management personnel who were involved in the preparation and operation of the flight of STS-107 back to their duties and remove them from directly managing or supporting the investigation." O'Keefe felt that Gehman's letter violated their understanding about how to handle the reassignment and made the issue a matter of public record, one in which the guilt of individuals involved was being ascribed. "Why did you send a letter?" O'Keefe asked Gehman. "I made a mistake," the admiral replied.[56]

In a letter dated February 28, O'Keefe wrote Gehman that the individuals in question would remain in place, as removal "will be viewed as prejudging the facts before the investigation is complete." Gehman, as skilled in the art of bureaucratic politics as O'Keefe, leaked the correspondence to congressional contacts and posted it on CAIB's website. The resulting legislative and media furor, in which CAIB's independence was clearly raised as a concern, caused the NASA administrator to back down. Ham, Roe, and others were reassigned, the Mishap Team was disbanded, and new staff with no past direct involvement in *Columbia*'s flight were assigned to Gehman. O'Keefe reportedly felt "stabbed in the back." Maybe so, but Gehman felt he was in the right, and it was O'Keefe who had erred in his tactics.[57]

Gehman also pressed ahead on the foam theory, NASA's views notwithstanding. He explained his position as follows: "It has been scorched into my mind that bureaucracies will do anything to defend themselves. It's not evil—it's just a natural reaction of bureaucracies, and since NASA is a bureaucracy, I expect the same out of them." He was not about to accept "blindly" what the organization said, especially if it said: "Got to be true!" or "We know this to be true." When he heard that, said Gehman, "all my bells go off."[58]

Since NASA was saying the foam could not have done it, with O'Keefe himself disparaging "foamologists," that was a good reason for Gehman to subject this particular theory to a strong test as the inquiry proceeded—while also investigating all other possible causes. O'Keefe, himself a student of organizations, thoroughly aware of bureaucratic pathologies, understood from whence Gehman came. But, as NASA administrator, he had a different role, and that included a measure of protection for the organization, which he had come to appreciate and admire. Nevertheless, the bottom line for O'Keefe was to get to the truth.

Communicating the Problems

In the case of the *Challenger* inquiry, NASA had very little contact with the panel, headed by William Rogers. O'Keefe wanted contact with Gehman in

order to learn as quickly as possible what went wrong, so he could make repairs. O'Keefe knew he would have to wait for CAIB to finish its inquiry before taking many actions. However, there were some immediate moves he could make to deal with obvious errors. Gehman agreed with this need to communicate in spite of differences of opinion and tensions in the relationship. As Gehman stated: "The board decided early on that we were going to take a cooperative approach with NASA. The way we like to describe it was: 'This is not a point-scoring contest with NASA to see if we could outscore them.' Indeed, everything we found or concluded, we wanted them to know about it so they could get to work on getting it fixed."[59]

It became increasingly clear that military intelligence organizations might have taken photos of the shuttle damage, but had not done so because NASA did not ask. This was a conscious decision by NASA not to make a request. One NASA engineer said that not asking was "bordering on the irresponsible." But Dittemore was quoted as saying that photos were not sought because, even if NASA had such photos, there was nothing the agency could have done. O'Keefe publicly rejected this view, saying Dittemore was "misunderstood." "Given the history of this agency, there is positively nothing that would have been spared in our efforts to find out what to do to avoid catastrophe."[60] In March, he worked out a new arrangement with military agencies and the National Imagery and Mapping Agency to get photos, to make certain such photos were taken in the future routinely.[61]

By April, CAIB was focusing more intensely than ever on the foam theory. Foam impact tests were being set up to test the amount of damage foam could have caused. NASA engineers admitted there was always concern that a big piece of foam might break away from the shuttle and damage it.[62] Foam debris had been a recurring problem, and a piece had recently broken off Space Shuttle *Endeavour,* in November 2002.[63] The risks had been discussed, but nonetheless, NASA had decided the risks were acceptable.[64]

As O'Keefe heard more—and he heard directly from Gehman as well as through his own internal investigation and media leaks—he grew more concerned. O'Keefe told Gehman to pursue the truth, wherever it led. The entire space program hinged on the investigation, he said. In mid-April, O'Keefe received CAIB's first set of recommendations, covering technical changes NASA could make fairly easily.[65] O'Keefe stated he wanted to return the shuttle to flight as soon as possible, compatible with safety, hopefully by year's end. After all, he reminded everyone, he had the space station to worry about, now orbiting with just two crew members.

Gehman was telling O'Keefe the problems were not only technical, but managerial and cultural. O'Keefe was ambivalent. On the one hand, he agreed that NASA had done a poor job in identifying trends in threats to safety. He said that shortcoming "has come screaming home to me."[66] On the other hand, he continued to be protective. On April 19, Dittemore announced he was resigning—a resignation said to have been planned prior to *Columbia*. O'Keefe spoke well of Dittemore. Others did not, since he was shuttle program director, and had not adhered to NASA's own rules in terms of physical presence at meetings during the flight.[67]

There were critics saying NASA, in general, had been negligent. CAIB hired sociologist Diane Vaughn, who had written a book after *Challenger* about NASA's willingness to violate its own safety rules.[68] When deviation did not result in an accident, NASA, she said, continued to ignore the rules. She called her theory "normalization of deviance." Others defined those words as complacency. On April 24, she was quoted as saying the *Columbia* situation looked a lot like *Challenger* to her. O'Keefe reacted sharply: "I imagine book sales must be up. I can't quite square some of the things that I hear and what I'm seeing here…. It's not complacency at all."[69]

O'Keefe realized NASA was taking a beating in the media from the information it was itself supplying, and "culture" was now part of the media explanation for NASA errors. NASA, he admitted, had a credibility problem and, if the critics were right, a genuine problem in organizational learning. To help with both the appearance and reality of NASA's limitations, O'Keefe said he would appoint a board headed by Tom Stafford and Richard Covey, former astronauts, to oversee how NASA carried out the CAIB recommendations. The Stafford-Covey group, he said, would "keep us honest." He also began looking more intently to the Navy for lessons learned in its safety programs.[70]

On May 12, O'Keefe named William Parsons to replace Dittemore. He was still hopeful for an early return to flight at this point. No longer by the end of the current year, however—now he hoped for early the following year. Meanwhile, Gehman was running into his own battle with Congress over the independence issue. Congress wanted access to the testimony CAIB received from NASA sources in secret. Gehman said he had to provide a guarantee of secrecy to get candid statements. Congress still insisted. This devolved into an extended debate. It may have helped move O'Keefe and Gehman personally closer—the fact that they both were being criticized by Congress.[71] In mid-May, the two men testified before lawmakers. Gehman hit NASA hard, but did not direct his ire at particular individuals, including O'Keefe. Instead, he said it was the "system," and the problems went back years, long before O'Keefe's era began.[72]

The Foam Did It!

In late May, the foam tests began, led by CAIB member Scott Hubbard, director of NASA's Ames Research Center. Many of NASA's shuttle program engineers, particularly at Johnson Space Center, still contended the foam theory was wrong. Hubbard believed the tests would tell the tale. In early June, foam was shot at a shuttle wing at the speed CAIB calculated foam hit the same spot on *Columbia*. The damage was extensive, and provided convincing evidence even to NASA skeptics that, as Hubbard said: "The foam did it!" Gehman, speaking of the NASA doubters, said, because of the tests, NASA's "whole house of cards came falling down."[73]

Whatever he might have thought earlier, O'Keefe was now fully persuaded—not only about the foam, but also about NASA's "cultural" problems. On June 5, as the media were filled with news and editorial comments about the foam tests, O'Keefe conceded that the decision to continue the mission after possible damage from a debris hit at launch was detected "was clearly the wrong judgment." He knew that mitigating the problems uncovered would take much more time and money than originally thought. He said fixing shuttle would "cost what it costs" and that NASA would follow CAIB's recommendations "without debate." To make certain photos could be taken, night launches would end. He projected spring 2004 as the most likely time to return to flight.[74]

On June 27, he told NASA employees that the CAIB report would "be really ugly." He directed the agency to brace itself for the criticism. He also made it clear he would not wait for the final report before taking major action. If anything, he intended to raise the bar of safety even higher than CAIB recommended.[75]

Gehman, meanwhile, was in informal contact with Congress (settling on a compromise whereby a selected few lawmakers could see the secret testimony) and with O'Keefe. Although Gehman did not publicly single out particular individuals, he privately told O'Keefe that some clearly had made management errors, and named names. In taking action, O'Keefe considered carefully what he had learned from Gehman as well as intelligence gathered from within the organization by Pastorek, who had been asking lots of questions since *Columbia*.

Taking Action

In late June, early July, O'Keefe began making changes, intending to move before the CAIB report came out (in August). He figured he knew from many talks with Gehman what to expect. Moreover, Gehman was saying publicly that management was part of the problem.

O'Keefe initiated a management shake-up. Three shuttle managers—Linda Ham, Ralph Roe, and Lambert Austin—were reassigned away from flight decisions. All had taken part in choices concerning *Columbia*. O'Keefe also made it known he was creating a new "Engineering and Safety Center," to be located at the Langley Research Center in Virginia. This new unit would review trends and have the authority to stop a mission. "The effort we need to go through, the high bar we need to set for ourselves ought to be higher than anything anybody else would levy on us."[76] And when the CAIB report did come out, said O'Keefe, we will "implement those [CAIB recommendations] without further argument ... without further equivocation." The statement that NASA would abide by CAIB's report represented a conscious decision by O'Keefe, even though some in NASA wanted him to wait. While it closed potential options, it served O'Keefe's interest in getting closure to the inquiry as soon as possible.[77]

O'Keefe was still hoping to get back into space by the next spring, but acknowledged the challenge. Moreover, in mid-July he declared: "I'm not con-

fident we can ever erect a procedure, a process, a system, a capability to detect every single thing that could possibly pose a risk to the operations."[78] O'Keefe continued to tell employees to anticipate a pounding and also briefed international partners on what to expect in the CAIB report.[79]

CAIB Delivers Its Report

In August, CAIB finished its report. Simultaneously, NASA produced a preliminary plan for return to flight. NASA had spent more than $150 million on the seven-month investigation, most of it in collecting shuttle debris. This collection was a successful activity, and revealed to O'Keefe broad public interest in the space program through the many volunteers who participated. The coordination among many parties was a success story that did not get reported by the media, in his view.[80] Millions of dollars had also gone to the Gehman panel, to pay staff salaries, numerous consultants, and especially for expensive foam tests.

On August 26, Gehman shook hands with O'Keefe in his NASA office and handed him the final report. O'Keefe thanked him, and then Gehman, who was accompanied by MIT professor Sheila Widnall, a board member, left. The process took 10 minutes and the atmosphere, Gehman recalled, was "stiff, very stiff."[81]

Congressional Reaction

In early September, Congress held hearings on the CAIB report. O'Keefe and Gehman were featured. The major question Congress asked was, Who was to blame? O'Keefe was criticized in the report for "schedule pressure," as he pushed NASA to meet a February 19, 2004, U.S. Core Complete deadline. He had been determined to show NASA could perform on time and within cost and thus get off the probation he had helped impose while at OMB and which he inherited when he came aboard NASA. The Core Complete deadline was not etched in stone, but O'Keefe's managers pushed hard and those below felt pressure.[82] This schedule pressure charge came as a surprise to the NASA administrator, who recalled he had been told by Gehman that CAIB would not put the personal indictment into the report. But there it was—in writing.[83] Whatever Gehman said or did not say in one-on-one conversations was subject to misinterpretation. O'Keefe was trying to seek out information, and Gehman sought to be helpful. But Gehman was chair of the group, and the group (the CAIB) made decisions about what was placed into the final report. On the other hand, Gehman defended O'Keefe to Congress, pointing out that the systemic problems afflicting NASA were the real culprits, and they developed long before O'Keefe came on the scene. If not O'Keefe, Congress asked, then who?

The CAIB report mentioned O'Keefe's predecessor critically. It studiously avoided citing lower-echelon culprits (although some individuals were mentioned). O'Keefe refused to single out anyone, saying he would not be party to a "public execution." What about accountability? Congress pressed hard.[84] O'Keefe said he was accountable, and he was making personnel and organizational changes—15 new people on the shuttle management team. The NASA administrator made it clear he was considering each case on its merits. His approach was surgical. Most of the changes were at Johnson Space Center, rather than at NASA headquarters.

The big problem, said O'Keefe, was that "people are very fallible, people make mistakes." The challenge was to change people's attitudes from one of "prove to me that it's not safe to fly" to "prove to me that it is safe." As the CAIB report emphasized, NASA treated the shuttle as "operational." It was really still "experimental."[85] O'Keefe believed the creation of the Engineering and Safety Center, as an independent check to the program offices, would help create the necessary balance of interests and attitudes. Gehman, however, who had backed the center to O'Keefe earlier, now, in hearings, said it was not strong enough as an independent technical authority. This was a perceived change in position that, like the "schedule pressure" issue, caused surprise and frustration for O'Keefe.[86]

The most pressing problem was the shuttle. It was incredibly complex and getting old. Congress hammered O'Keefe on the future of the shuttle and the need for a vision beyond the shuttle and space station. CAIB had said as much. To take risks with human lives required benefits that had to be equally large. O'Keefe listened to calls for vision and almost surely contrasted them with the reception he was getting from Congress in his requests for a budget increase. Perhaps he was also frustrated with his

old mates at OMB, who were equally unreceptive to NASA's financial needs. As to vision, O'Keefe, in hearings, touted his notion of a "stepping-stone" approach to space exploration, meaning development of a sequence of new technical capabilities for whatever destination the nation chose. He said NASA needed the Orbital Space Plane to take pressure off the shuttle. But the OSP, congressional and other critics pointed out, just got NASA to the space station and back. They asked O'Keefe: What's your goal beyond the space station?[87] O'Keefe generally kept his cool before Congress, but when he was away from the legislators, he called Washington a "logic-free zone."[88]

Turning Crisis into Opportunity

If there was any silver lining coming from the *Columbia* cloud, it was that there was a new consensus that NASA needed change, and O'Keefe was able to push change related to safety. He was setting up the new Engineering and Safety Center at Langley as a check on the program offices. Gehman may have wanted more, but this was still a considerable reorganization. He had the Stafford-Covey group, now grown to 26 strong. Gehman had made it clear that NASA's Aerospace Safety Advisory Panel (ASAP), the traditional check for safety, was ineffective. This judgment, which became public, caused a resignation by all members and gave O'Keefe the chance to appoint new people. Moreover, he hired a well-known consulting organization to help him with the longer-term and deeper cultural change that CAIB said was needed at NASA. He said he would borrow a culture-change technique from the Marine Corps called "repeated rhythmic insult." All these moves aimed at enhancing the power of safety interests at NASA.[89]

But now O'Keefe saw the chance for even broader change—transformation—linked to the call for a new vision from Congress, media, and many of his own advisors. CAIB said that an underlying problem causing the *Columbia* disaster was NASA's attempt to do too much with too little in the way of funding. The shuttle budget had been particularly squeezed as NASA sought to build a space station, pursue a viable space science effort, and create a shuttle successor launch system—all at a time of overall agency downsizing. The funding problem was due to the absence of a "compelling vision" of the future. To risk human lives to go into low Earth orbit just didn't seem worth it. In fact, this call for a new vision suggested to O'Keefe a window of opportunity for long-term NASA recovery.

O'Keefe now pursued two kinds of recovery strategies. One was short term: return to flight of the shuttle. Unfortunately, even the short-term plans were beginning to stretch longer.[90] In early October, it was reported that instead of spring 2004, the shuttle might not go up until September 2004. CAIB had set forth 29 requirements NASA had to meet, and what NASA did would be reviewed by the Stafford-Covey team. Some of these requirements were technical changes to be surmounted before return to flight; others could happen later. Many would be difficult indeed, such as the capacity to repair the shuttle in space, particularly away from the space station. Cultural change fell into the very long-term, nontechnical recovery mode.

But real long-term recovery also required a goal that would give NASA greater public support and additional funds, the opportunity to go beyond recovery to revitalization. What should that be? In the 1990s, Dan Goldin, O'Keefe's predecessor, championed a manned Mars mission as NASA's next big goal. But he could not sell that to the Clinton White House and he did not particularly try to do so. The Clinton administration would support only unmanned Mars flights. First, said President Clinton, finish the space station; then we'll discuss more distant human spaceflights.[91]

The senior George Bush had proclaimed moon-Mars as a goal back in 1989, but that objective disappeared quickly from his and the nation's agenda. From the standpoint of congressional and public opinion, such a goal was premature and dismissed by most observers as empty rhetoric. O'Keefe felt the *Columbia* accident made a big decision that might adhere this time more possible. In 1989, there was no space station. In the 1990s, one had been built and orbited the Earth. There was much more work to do on the station, but the end was in sight. A space station in orbit was the major achievement of Goldin, albeit over cost and incomplete. O'Keefe had in his first year presented a modest agenda. He now decided the time was ripe to try for a big decision.

Using the Crisis Period to Get a Strategic Presidential Decision

George W. Bush had shown little interest in space until *Columbia*. Now, in the wake of *Columbia*, he seemed open to considering new options.[92] O'Keefe saw a window of opportunity. Not long after the *Columbia* accident, lower-level staff in the White House from the Office of Science and Technology Policy and other entities had begun meeting in an ad hoc way to consider post-*Columbia* space policy. In the spring, O'Keefe entered into and began to mold a planning process that built on the earlier activity. He did not want to have a process that was just "NASA and the president." He wanted one that was "national" or, at least, interagency. In May, he had enlisted John Marburger, the president's science adviser, to give more direction and organization to staff planning. In late summer, he persuaded Steve Hadley, the National Security Council (NSC) deputy director, to assume leadership of the interagency activity.[93] O'Keefe's strategy was to raise the level of participants from staff to policy executives. The "Hadley Committee" for venting options became known as the "Deputies Committee," reflecting the involvement of deputy secretaries of cabinet departments, as well as senior NASA and White House officials.

This senior level of involvement was aimed at producing a consensus executive-branch position, neutralizing possible bureaucratic opposition, and attracting allies to NASA. The importance of getting a presidential decision was that it would thereby enlist OMB, and subsequently help in attracting Congress and the general public. The NASA administrator engaged not only Hadley, but also Margaret Spellings, who led the Domestic Council. In effect, O'Keefe designed a hybrid NSC–Domestic Council interagency process. Representatives from the White House, including OMB and the science advisor, the Vice President's office, as well as various agencies, met regularly. Those engaged sought to keep the process contained within the executive branch to avoid premature congressional and interest-group pressures. O'Keefe was building a coalition of support among executive operatives close to the president to help get a presidential decision.

O'Keefe built on previous staff work in formulating the options and virtually every possible idea was considered, including abandonment of manned space. O'Keefe sought to link planning with the budget process, another reason to conduct discussion behind closed doors. By linking planning with budgeting, as O'Keefe wished to do, there had to be some measure of closure by late November or early December in order to get the results of the planning process incorporated in the upcoming president's budget.[94] O'Keefe's support from Cheney was invaluable in motivating the various high-level and busy players to meet. The process was remarkably free of leaks, much to the frustration of the media, Congress, and others.

In October, O'Keefe briefed Bush on plans for the decision process. Bush said he was anxious for something bold. Whatever reservations O'Keefe might have had in asserting NASA's claims were set aside once he sensed potential Bush support. OMB, however, was reluctant to grant any raise to non-security agencies, including NASA, a position reflecting a presidential directive to hold the line on spending. O'Keefe lobbied strenuously with OMB and White House staff for a substantial increase in budget, according to some reports, $27 billion over five years. This was mainly to accelerate development of the Orbital Space Plane, the centerpiece of his pre-*Columbia* Integrated Space Transportation Plan, as a shuttle alternative. He complained that bold visions without resources "will make us [NASA] look ridiculous." The argument for a big increase got nowhere. At one point, the NASA-OMB split became so heated that Hadley called time out, and directed staff to find a way to make some of the options the executives wanted affordable.[95]

In late October, there was interagency consensus on the goal of a return to the moon. Presidential Science Advisor Marburger argued that a good deal of useful science could be done from a moon base. But Bush gave signals that even that goal was not bold enough, and so the goal became moon-Mars. Then it became something broader—moon, Mars, and beyond. Perhaps reflective of his Harvard Business School training, Bush believed his role as the nation's "CEO" was to provide a long-range "vision." It was also a vision similar to the one his father had extolled, with little to show for results. The key word George W. Bush seemed to want was "exploration."[96]

The stickler, as always, was money. OMB continued to take a hard line. O'Keefe begged, pleaded, argued, and made his case directly with his old boss at OMB, Mitch Daniels. It was remarkable—a man who had come to NASA as a "bean counter" from OMB now fighting intensely with OMB to back a big goal with real money. As 2003 moved to an end, an agreement was reached between NASA and the White House, OMB included, that a new "exploration initiative" would be approved, and jump-started with additional money the first fiscal year, with more coming over the ensuing four years and after. However, as funds for exploration ramped up, expenditures for other manned programs (shuttle and space station) would have to go down to make room for the new exploration mission. In other words, NASA's budget would go up to some extent, but most of the money for the new program would come by phasing down the older efforts. The new would gradually replace the old. Planning and budgeting strategies were meshed, with O'Keefe working and lobbying behind the scenes, masking his own role in a collective effort.

On December 19, the moment to finalize a major policy decision came. O'Keefe, Cheney, Hadley, Marburger, and others met with Bush. Among the other Bush advisors present was Karl Rove, the president's political confidant. Bush looked at the decision papers, the budget numbers, and asked: "This is more than just about the moon, isn't it?" When no immediate response came, Cheney spoke up, prompting O'Keefe and others involved in the exercise: "Then this is really about going to other destinations, isn't it?" O'Keefe had downplayed "destinations" before *Columbia*. The circumstances were now very different. The answer the president got was: "Yes." "Well," responded the president, "let's do it!" To O'Keefe's surprise, Bush then told Hadley to find the next date when he could make a major speech to announce the decision. Bush wanted the decision to get maximum visibility.[97]

Management Lessons Learned from Period Two

1. Take Charge of Crisis—Be Decisive, Open, and Consistent

On his first day at NASA, O'Keefe asked to see the agency's contingency plan for a shuttle disaster, never expecting he would have to employ it. When *Columbia* disintegrated February 1, 2003, he urgently needed the plan. O'Keefe followed it in all respects, including the setting up of an investigating body. That O'Keefe was "in charge" was a decision the president made after O'Keefe was already acting on the plan in responding to the disaster. The combination of a contingency plan and support of the president was critical in allowing O'Keefe to move quickly and decisively.

Another lesson of *Columbia* for crisis management is the importance of "being open." After *Challenger,* NASA appeared less than forthcoming, and it hurt the agency's image and public support. After *Columbia*, O'Keefe determined that openness would help in public/media/congressional support more than it would hurt in releasing embarrassing information. He appeared before the media and represented the agency with a presence that indicated compassion for the deceased astronauts and determination to move forward. He also sought to convey a consistent message on behalf of the agency. While he had a problem with his shuttle program director in this respect at first, he largely succeeded in keeping the agency coherent and consistent in its approach to the investigating committee and larger audience.

2. Develop a Close but Visibly Independent Relationship with Investigators

O'Keefe's prime goal in the wake of the *Columbia* disaster was to find out what went wrong, fix it, and return to flight. He had a space station in orbit, now restricted to two occupants, and reduced in performance. Further assembly was on hold. The shuttle had everyone's attention, but he still had ISS to worry about. Gehman, the Columbia Accident Investigation Board leader, had the identical goal as O'Keefe, insofar as return to flight. However, in looking for what went wrong, he and CAIB went beyond the technical to the managerial/cultural aspects, and this enlargement of the investigation slowed the inquiry. It also caused friction when Gehman's insistence on reassigning certain NASA staff aiding CAIB clashed with O'Keefe's desire to protect his employees.

Both men had an interest in the credibility of the ultimate report. This basic consideration meant that they worked together and shared information, but maintained the appearance and reality of CAIB's

independence. By most accounts, the O'Keefe-Gehman relationship worked well. NASA found out about technical problems early, and was able to get started on fixing them sooner rather than later. The report was indeed tough on NASA, especially in regard to management, but that helped make it more credible. Differences over tactics between the two men never got in the way of their shared strategic interests.

3. Hold Individuals Accountable but Reject a "Public Hanging"

After CAIB came the congressional inquiry. Various lawmakers, who wanted to know whom to blame, pressed O'Keefe on accountability. As noted earlier, O'Keefe himself was indicted by CAIB for "schedule pressure" to meet the U.S. Core Complete deadline. But CAIB emphasized that "systemic" management problems that went back many years were at fault and no one seriously held O'Keefe culpable. Further, Gehman backed O'Keefe in avoiding finger pointing at particular individuals. Quietly, O'Keefe made personnel changes in the shuttle program where he believed they were needed, and shielded many individuals as best he could—a fact that not only helped agency morale, but also minimized disruption in making technical and organizational repairs. This surgical approach expedited O'Keefe's goal of returning to flight as soon as possible. He specifically rejected the offer of resignation on the part of his director for manned spaceflight, who, like O'Keefe, was relatively new to the job.

4. Embrace the Investigators' Report, but Don't Close Off Options

O'Keefe set in motion Return to Flight (RTF) procedures and made a number of organizational changes that CAIB recommended. In addition, O'Keefe went beyond CAIB in applying certain safety practices, such as limiting shuttle flights to daylight hours. O'Keefe personally attended weekly RTF meetings to emphasize his personal concern and immerse himself in the technical details of shuttle repair. He also appointed an independent body (the Stafford-Covey panel) to oversee NASA's Return to Flight to "keep the agency honest." However, it is possible O'Keefe went too far in saying NASA would adhere to CAIB. CAIB was a recommender, not the decision maker. When the Hubble decision came up later, O'Keefe felt bound, by his own words, to live with strictures set by CAIB and cancel the service mission. Gehman himself indicated that CAIB was more flexible than O'Keefe seemed to feel when it came to using the shuttle for Hubble servicing.

5. Use Crisis to Leverage Transformative Change

Columbia was a national, indeed international, disaster. It got everyone's attention even in a turbulent era dominated by post–9/11 jitters, Middle East war, and mounting budget deficits. CAIB pointed out bluntly that the national political process had failed to solve the big issue of a shuttle successor. Goldin's X-33 was dead and OSP was an interim step in O'Keefe's stepping-stone strategy. There had to be a bigger decision—a national policy decision—to replace the shuttle, a vehicle getting old and risky. That decision, CAIB pointed out, had to be coupled with a "compelling vision" to guide the entire space program. There was nothing new about what CAIB said. The difference was that CAIB had legitimacy (because it was perceived as "independent") in the wake of *Columbia*, and the politicians were finally listening.

A staff process was already under way in the White House to study post-*Columbia* options when O'Keefe initiated his decisional strategy. O'Keefe was a White House insider, close to Vice President Cheney. He understood the politics of presidential decision making in the Bush era as well as anyone. Hence, when he moved, he did so carefully and with an eye to getting a decision that had a chance to be sustained. He elevated the existing decision process and broadened it, involving higher-level interagency representatives and deliberately linking it to the budget process, then ongoing in parallel. When it became clear that President Bush wanted to make a "bold" decision, O'Keefe himself became bolder. The "space exploration vision" of President Bush, announced at NASA in January 2004, was the result. The United States was going to the moon, Mars, and beyond, said Bush. The vision marked a big shift for O'Keefe. In his 2002 vision speech, he had pointedly rejected destination-driven goals in favor of science as driver. Bush's vision was in the spirit of manifest destiny, and O'Keefe's rhetoric shifted to "exploration, informed by science."

Observers noted Bush was echoing a moon-Mars vision that his father had stated in 1989. It had gone

nowhere because of the announced cost—close to half a trillion, according to NASA. Rather than announcing a total cost approach, O'Keefe crafted a "pay as you go strategy." Failing to get a bigger boost in the short run that he sought, he settled on a more modest front-end increase, with most of the money coming later from gradually retiring the shuttle by 2010 and scaling back U.S. spending on ISS once the facility was complete. The OSP, which had been largely on hold after *Columbia*, would be redesigned to become a new vehicle that would not only replace the shuttle, but would enable NASA at long last to escape Earth orbit. It would help return NASA to the moon by 2020.

The Executive as Steward of the President's Vision: O'Keefe in 2004

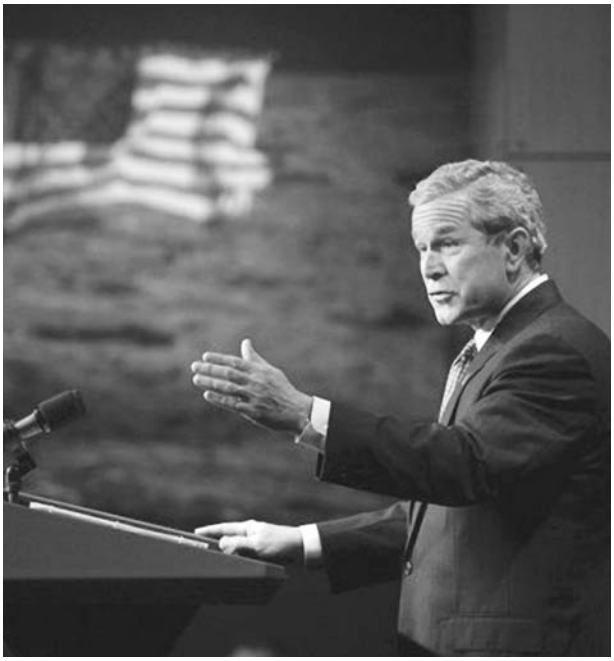
Turning Vision into Reality

On January 14, 2004, George W. Bush came to NASA's auditorium. There, he proclaimed the new "space exploration vision": back to the moon, on to Mars, and beyond—with robots, then humans. Eleven billion dollars would go to the exploration program, with a new start through $1 billion in additional funds in the first year and gradual rises in the next four. As noted, most of the initial $11 billion in exploration funds would come by reprioritizing within NASA's budget.[98]

In general, the reaction was positive to the vision as a goal, but Congress and others were skeptical that the money would be forthcoming in the existing political climate of war and deficits. O'Keefe's argument was that NASA had charted what virtually everyone had demanded in the wake of *Columbia*—a bold vision where noble purpose justified human risk. The "bean counting" administrator, who had played down destinations in favor of science and capability building, now had moon, Mars, and beyond destinations to defend. The Orbital Space Plane of his pre-*Columbia* strategy would now give way to a more ambitious Crew Exploration Vehicle (CEV) that would help lay the basis for going beyond the space station to the moon. For the first time in a long time, NASA had a clear priority in direction from the president, and a budget strategy to go along with it. O'Keefe now had to sell the decision to Congress—and the country—and lead its programmatic implementation.

Launching the Space Exploration Program

The question many observers asked was: Would the decision stick? Bush's father had made a moon-Mars decision in 1989, but it never really got off the ground. Virtually unfunded in the George H. W. Bush administration, the nascent program (then called Space Exploration Initiative) was quickly terminated by President Clinton. Would this decision be any different?



White House photo by Eric Draper

President Bush announcing his new vision for space exploration program on January 14, 2004.

O'Keefe wanted it to have a fighting chance to succeed. The next day, January 15, O'Keefe announced the implementation process was under way. He was creating a new NASA division, called Exploration Systems, headed by retired Admiral Craig Steidle. Steidle had been a successful technical manager in guiding the Defense Department's huge Joint Strike Fighter program into being. The dominant mission of NASA, O'Keefe said, was exploration informed

by science. The fact that O'Keefe used the phrase "informed by science" marked a shift from his pre-*Columbia* rhetoric: "driven by science." President George W. Bush was unquestionably in the "manifest destiny" tradition of spacefaring. He espoused exploration for its own sake. It was in the human spirit, he believed, and by pursuing it, enormous benefits, practical and inspirational, would inevitably come. O'Keefe was now the implementer and salesman of the Bush vision he had helped craft. He realized it would be a hard sell, but he reflected on his Jesuit education at Loyola in New Orleans, and said he would gather "one convert at a time."[99]

The president was going to ask Congress to provide $16.2 billion in the next fiscal year to get the program started, not quite the $16.4 billion hoped for, but quite a jump from the $15.4 billion NASA currently had. No other domestic agency (other than Homeland Security) was getting such a raise. Most were being held flat or worse. It would be up to O'Keefe to persuade Congress to go along with the president in the year 2004. Meanwhile, Bush established an advisory commission, headed by former aerospace executive Pete Aldridge, to provide guidance on the implementation process.[100] However, before O'Keefe could really get started on promoting the exploration vision, he ran into a political firestorm inadvertently of his own making.

The Hubble Controversy

On January 15, the *Washington Post* published a front-page article by Kathy Sawyer relaying the new presidential exploration policy. The article concluded by noting one of the impacts of the decision, namely that there would be "no further servicing mission to the Hubble Space Telescope."[101] The link of Hubble to the Bush initiative was incorrect, but that did not matter. When he read the story, O'Keefe realized a new "truth" was being created, namely that the first casualty of the moon-Mars program was Hubble. Moreover, Congress was still smarting about the closed-door nature of the way the decision was reached. Now, it seemed, NASA and the Bush administration were sacrificing one of the most successful space programs in history to get money for moon-Mars.

The next day, O'Keefe hurried out to the Goddard Spaceflight Center in Greenbelt, Maryland, to address the approximately 100 scientists, engineers, and administrators—government and academic—most involved with Hubble. It was an exercise in damage control. He explained that the CAIB report required a way to repair shuttle damage in space. While the space station offered a safe haven for astronauts effecting repairs, this would not exist for Hubble, which was in a different orbit from the station. He did not see how NASA could come up with a repair capability, independent of the space station, by the time a Hubble servicing mission was needed. This decision was about acceptable risk, he declared, not budget and absolutely not because of the president's new policy.

O'Keefe knew that letting Hubble deteriorate and eventually die would be tremendously unpopular with the scientific community, Congress, and general public. He had made the decision as part of the FY 2005 budget process, but it had not been driven by financial concerns. He had intended to delay its formal announcement to late January, just before the budget came out, to make sure he would have time to inform those most concerned in a way that reflected his safety perspective and softened the blow. But the information had been leaked, mistakenly, by a White House staffer who briefed congressional staff on the Bush policy and upcoming budget. A legislative aide told the *Washington Post*, and that was how it got into print when it did, connected to the moon-Mars initiative, rather than the CAIB report, as it was in O'Keefe's mind.[102]

The *Post's* version of truth quickly spread throughout other media. O'Keefe was on the defensive from the outset, and had to find a way to keep Hubble from detracting from his fight for the moon-Mars initiative. Senator Barbara Mikulski (D-Md.), the ranking Democrat on the Senate Appropriations subcommittee controlling NASA's budget, was extremely upset. She was known as a "mother wolverine" in her defense of her Maryland constituents, and the principal scientific institutions working on Hubble (Goddard and the Johns Hopkins University–based Hubble Space Telescope Science Institute) were in her state.[103] She wrote O'Keefe, saying she was "shocked and surprised by the decision." She demanded a "second opinion" before letting Hubble die prematurely. O'Keefe told her he would get such an opinion from Gehman, but the decision remained his responsibility. Gehman agreed to examine the rationale.[104]

While waiting for Gehman to respond, O'Keefe was criticized passionately by the astronomy community, media, and various legislators. O'Keefe himself had extolled Hubble in the past as a selling point for the space program. Everyone loved Hubble. The Hubble controversy ate into time he might have given to moon-Mars.

If O'Keefe thought Gehman would rescue him on Hubble, he was wrong. What O'Keefe wanted was a firm and public reminder by Gehman to everyone of the basic argument of the CAIB report—that the burden should be to prove a particular shuttle launch was safe, rather than prove it was unsafe.[105] The lessons of *Columbia* were being forgotten, in O'Keefe's view, as the February 1, 2003, event receded into history. Or maybe they did not apply to popular programs like Hubble. It was truly an issue of safety for O'Keefe—doing what was right.

His critics did not see the decision his way or believe his explanation. They saw it as a risk-benefit decision, in which the benefits of Hubble outweighed the risks. Worse, Hubble was now fully entangled with the Bush vision. Even space enthusiasts could not see how O'Keefe could promote a program to go back to the moon and on to Mars, which entailed gigantic risks, while ending Hubble servicing, a task the shuttle had accomplished on a number of previous occasions. It was all very confusing, and media discussions did not clarify the distinctions O'Keefe wished to make. The advocates of Hubble servicing, seeking to overturn O'Keefe's decision, found the conflation of Hubble and moon-Mars helpful in seeking to overturn the decision.

O'Keefe had innumerable detractors. He desperately needed a vocal, authoritative ally. Would Gehman fill the gap in support? The man who guided CAIB wrote on March 10: "I suggest only a deep and rich study of the entire gain/risk equation can answer the question of whether the extension of the life of the wonderful Hubble telescope is worth the risks involved, and that is beyond the scope of this letter." The Gehman response bucked the decision to do a "deep and rich study" to some other body, hurt O'Keefe, and gave Mikulski ammunition. On March 11, she asked O'Keefe to do what Gehman suggested, and get the National Academy of Sciences (NAS) to conduct an in-depth study.[106]

O'Keefe had been told by NASA officials familiar with Hubble servicing that it might be possible to perform a robotic mission to rescue Hubble. If so, that could help get the heat off O'Keefe, avoid putting astronauts at risk, and advance the moon-Mars cause through developing advanced robotic techniques. Thus, he told Mikulski he would ask for such an NAS study, but he wanted the panel to also consider the robotic option. Shortly thereafter, NAS set up a panel and went to work.

O'Keefe, meanwhile, found himself on the "60 Minutes" TV program defending his Hubble decision and coping with a petition from a number of ex-astronauts sent to Bush by Senator Kay Bailey Hutchison of Texas. Like it or not, O'Keefe couldn't escape the Hubble controversy. Attempting to offer an olive branch, on June 1 he went to a meeting of the American Astronomical Society in Denver to try to placate the community most in opposition. He explained his position on a shuttle mission, and announced his decision to seek contractors for a robotic effort. Many of the astronomers at the meeting appreciated O'Keefe's coming. But his willingness to do so and go for a robotic mission did not end the controversy.[107]

Back to Moon-Mars

While trying to quell the Hubble backlash, O'Keefe worked to get the exploration program established. He knew that with the presidential election coming up, he might have limited time to get the program under way before a change took place in the White House.

On June 16, the Aldridge Commission issued its report, stressing the importance of a long-range commitment to realize the goal of continuous exploration. It called for a White House council to provide guidance to the effort, a reorganization of NASA to adapt the agency to the new priority, and strong measures to enlist industry and the general public in the venture.[108] Much that the commission recommended was beyond O'Keefe's power as NASA administrator. The one area where he could act swiftly was on reorganization—what O'Keefe now called "transformation."

On November 24, he announced major changes in structure. The Exploration Systems Directorate

continued. Human spaceflight (ISS and shuttle) was placed in a new Space Operations Directorate. A new Science Directorate was established, absorbing the former space science office and Earth science. Significantly, the Office of Biological and Physical Research was moved under Exploration Systems, rather than standing alone as before. This was done in recognition of the fact that understanding and mitigating human limits to long-duration spaceflight were critical to exploration. The fourth major directorate of NASA was Aeronautics Research. O'Keefe also created a new Mission Support Office—Strategic Communications—that pulled together public affairs, external relations, and legislative affairs—essentially all the public/political outreach offices. These shifts were followed by other changes involving the centers. O'Keefe wanted a structure that reflected the new priority and would endure a while.

The November 2, 2004, election helped solidify moon-Mars when the people re-elected George Bush for another four years. The increased Republican majority in Congress also potentially helped from the standpoint of program continuity. The senior Bush had faced a Democratic-controlled Congress and had only one term—factors contributing to the early demise of his initiative. The political winds helped the younger Bush, and thus the prospects of sustaining his decision.

Also critical to the question of political support was the fact that Tom DeLay now represented the Houston-based Johnson Space Center. The influential House majority leader personally held up a vote in the House on an omnibus budget bill until NASA got virtually all of the $16.2 billion budget it had requested, along with unusual authority for the administrator to reprogram funds as necessary. Senator Ted Stevens, (R-Alaska), an O'Keefe mentor and the chair of the Senate Appropriations Committee, allied with DeLay in getting the funds and authority for NASA. NASA was virtually alone among non-security agencies in getting what it asked for. The Bush vision thus held in its first budget test with Congress. O'Keefe was elated and told his agency that now NASA really "must deliver." He declared: "We have a mandate. We have the president's direction. We have the resources. Now go do it. There aren't any more excuses."[109]

O'Keefe Resigns

On December 13, O'Keefe wrote Bush that he was resigning, although he would stay until a successor took over, hopefully in February. He soon accepted the job of chancellor of Louisiana State University. His announced departure seemed abrupt to many. There were some significant loose ends he was leaving, the most important being the successful return to flight of the shuttle, then scheduled for May 2005. In addition, the Hubble controversy still raged.[110]

O'Keefe had sought to defuse the Hubble issue and even turn it to advantage by proposing a robotic service mission instead of a human/shuttle mission. But shortly after O'Keefe said he was leaving, the NAS panel reported that the robotic mission was unlikely to be ready technically in time to save Hubble. It urged NASA to reinstate the cancelled Hubble servicing mission using a space shuttle. His last official duty was to announce the president's FY 2006 budget for NASA. Once again, NASA was given a raise—$16.45 billion—when almost no other non-security agency was so treated. However, the raise was $500 million short of what Bush had projected earlier. To provide funds for exploration, other programs were cut, including both robotic and human servicing of Hubble.[111]

Ironically, as he left office in February, O'Keefe was criticized for not having succeeded in various financial reforms for which he had originally been hired. While continuing rises in space station costs were understandable as a result of the inability to progress on assembly, less understandable to critics were delays in creating an agency-wide financial system able to track costs accurately.[112]

Management Lessons Learned from Period Three

1. Get a Presidential Policy Off to a Fast Start

While the White House–level discussions that resulted in the Bush exploration vision were moving forward, O'Keefe was also considering what he could do to get implementation of the vision under way quickly through administrative techniques at his disposal. Immediately after the Bush decision, O'Keefe announced he was hiring a retired admiral with a strong technical management reputation, Craig Steidle, to run the new Exploration Systems

Directorate at NASA. This new office would be the focus for developing the Crew Exploration Vehicle and other moon-Mars technologies.

In addition, O'Keefe began the process of building a constituency in Congress and elsewhere to get the resources needed to begin the long exploration journey ahead. He had the good fortune to have House Republican Majority Leader Tom DeLay, who represented the district that included Johnson Space Center, as an influential ally. When Congress gave NASA $16.2 billion at the end of 2004, virtually all it had asked for, along with considerable authority to reprogram money, O'Keefe said this action was an endorsement of the Bush decision. Maybe it was and maybe it wasn't, but it certainly was absolutely critical to getting the new mission off to a fast start.

2. Avoid Distractions

The last concern O'Keefe needed when he was trying to promote the exploration vision externally and reorganize NASA internally for "transformation" in 2004 was the distraction of a bitter conflict over Hubble. Was his decision to terminate servicing for Hubble a mistake? O'Keefe's position was that he could not meet CAIB's safety requirements for in-space repair capability and thus could not send a shuttle to service Hubble. The scientific community, Congress, the media, and many in the general public strongly opposed this decision. Hubble was special! The fact that the news of the Hubble termination decision leaked made it impossible for NASA to build support for the decision, or at least soften opposition. When Gehman's "second opinion" failed to bolster O'Keefe, and the National Academy of Sciences issued an outright rebuff, the NASA administrator was placed on the defensive. Worse, the widespread interpretation of the decision was that Hubble was a casualty of the exploration vision, not of CAIB. Appearance can be reality in Washington, and the casualty view quickly became conventional wisdom. O'Keefe's fallback strategy to save Hubble via a robotic mission was found by the NAS and other outside analysts to be not feasible in the time frame needed for repair. It was also very expensive. O'Keefe held firmly to his stand: no shuttle for Hubble on his watch. When he left NASA in February 2005, the Hubble controversy still raged, and the *New York Times* called him "petulant" for his adamant stand.

O'Keefe termed Hubble a Hobson's choice—a choice that does not offer a real alternative because both options are bad—with launch the worse because of the risk to the astronauts. Many experts said he was wrong on the risk. He clearly had made a "judgment call." He may have been right, but without ample supporting risk analysis and vocal allies as backup, his decision had the appearance of being arbitrary and premature. Hence, the Hubble decision complicated the selling of the exploration vision, and could have been postponed to a time more politically efficacious. O'Keefe rejected postponement as irresponsible. As it turns out, O'Keefe's successor will make the final decision on Hubble.

3. Emphasize Safety, Have a Contingency Plan, Communicate to the Public the Risks of Space

Dan Goldin was NASA administrator for nine and a half years. There were shuttle problems during his tenure, but no accidents. He encouraged safety, and was lucky, too. O'Keefe was administrator 14 months when *Columbia* disintegrated. He also pushed for safety, and was unlucky. What happened on O'Keefe's watch could easily have occurred under Goldin. An administrator must do everything he can to mitigate risk and avoid disaster. He should have a contingency plan if one occurs. But he should also better communicate to the public the fact that spaceflight is simply a high-risk endeavor. If the country is to move forward in space exploration, it must be more realistic about the dangers.

Conclusion

Sean O'Keefe was appointed NASA administrator at the end of 2001 and served until February 2005, a little over three years. The years were tumultuous, and each had a different emphasis. His initial role was to solve the space station's financial mess. His credentials were primarily those of a financial manager, a master bean counter to many in Washington, D.C. His vision speech at Syracuse University emphasized science-driven goals and developing technology, not human spaceflight to specific destinations. It featured education as an initiative and reflected his "back to basics" approach.

Then came February 1, 2003, and the course of O'Keefe's tenure dramatically changed. Although CAIB indicted him for "schedule pressure," few blamed him for an event CAIB amply demonstrated was rooted in NASA's history and culture. To his immense credit, O'Keefe got NASA through the *Columbia* inquiry with minimal damage to the agency, and he initiated needed organizational changes to enhance safety values. Then, he used the disaster masterfully to help forge a new direction for NASA. Getting a presidential exploration decision and start-up resources was an artful display of bureaucratic maneuvering. He used his experience in government and White House connections to the hilt, turning *Columbia*, its aftermath, and the president's attention into a window of opportunity for change. Hubble came as an unwanted distraction that complicated his attempt to sell moon-Mars and festered as a problem for his successor when he left.

So there were three O'Keefe's, one featured in each year of his tenure: the financial manager, the disaster leader, and the embattled policy entrepreneur. *Columbia* was unquestionably the centerpiece of his tour. O'Keefe's tenure at NASA was brief but extraordinarily eventful. The most important legacy he left was not financial reform or even the International Space Station. NASA's financial reform and space station construction were both interrupted by *Columbia*, becoming much less of a priority to O'Keefe. Hence, his mark will most likely be the space exploration initiative. Ironically, his own Hubble Space Telescope decision hurt the selling of the initiative.

Whether O'Keefe's arguably premature departure from NASA will prove damaging to sustaining the space exploration vision remains to be seen. A great deal of selling of that initiative lies ahead. Meanwhile, NASA has the shuttle and space station programs to surmount. O'Keefe worked to change the NASA culture and make it more safety-conscious while also pursuing return to flight. On July 26, 2005, Space Shuttle *Discovery* lifted off and 14 days later, on August 9, landed successfully. The flight went well, but again foam came off the external tank. NASA had more work to do, admitted that fact, and delayed subsequent shuttle flights to deal with the foam questions. For O'Keefe, the continuation of the foam problem had to be frustrating, but the way NASA handled the issue could be seen as marking a change in the direction of caution, as O'Keefe had intended.

Clearly, O'Keefe *began* a lengthy and complex process of change involving NASA, the shuttle, the space station, and the moon-Mars exploration vision. Seeing the process through will require many years and a relay of NASA leaders after O'Keefe. Moving forward in space is a marathon race, and O'Keefe ran only the first lap.

Thus, the three-year tenure of O'Keefe, while brief, was eventful. It illustrated vividly the degree to which an executive faces rapidly changing fortune.

Sometimes the situation he faces is the result of his own actions, but frequently he must respond to events over which his control is limited at best. A new situation can hurt as well as help the executive. A crisis in particular can lead to upheaval, and can destroy or elevate the leader. It concentrates attention on the executive and raises expectations that he "do something." How the leader performs usually depends on how he plays the hand he is dealt.

O'Keefe generally handled *Columbia* well in a strategic sense, although he may have stumbled a bit tactically. In the end, he showed how experience and political connections in Washington can be turned to advantage. Steering NASA potentially out of the low Earth orbit in which it has been mired since Apollo's end was a major move. When he arrived at NASA, O'Keefe spoke of getting NASA back to its roots. When he left, he had succeeded in part by the new emphasis on exploration. The way he got the presidential decision and initial funding for it was highly skillful. He pointed NASA and the nation in the right direction, although financing and implementation over the long haul will be tortuous in the extreme.

For a man who started as a bean counter, the moon-Mars exploration vision represents quite a legacy.

Central lessons from O'Keefe's tenure at NASA include the following:

1. Anticipate changes in fortune and have contingency plans for them; be "light on your feet"; adapt to new exigencies.
2. Be proactive in meeting the tests that come; think strategically, with care to tactics.
3. Minimize negative impacts of changed situations; do not make them worse by your own choices.
4. Maximize opportunities that changing fortune presents for major, transformative decisions not otherwise possible.

Epilogue

When Sean O'Keefe left NASA to become chancellor of Louisiana State University (LSU) in February 2005, he no doubt looked forward to respite from the stress of Washington. Now he would deal with football coaches and parking lots instead of Congress and the unremitting pressure of a disaster-prone space shuttle.

But on August 29, 2005, Hurricane Katrina made landfall and tore into the Gulf Coast. The levees guarding New Orleans were breached and water flooded the city. Baton Rouge was relatively spared the brunt of hurricane damage, but the city and LSU quickly saw their roles changed dramatically. Baton Rouge, already the state capital, now became the seat of the New Orleans government. It also became a hub for federal, state, and local emergency relief efforts. LSU was in the middle of all the forces converging on Baton Rouge, and O'Keefe, as its chancellor, was once again forced to put his crisis leadership skills to work.

O'Keefe suspended classes and converted his university into a medical receiving center for victims of the disaster using the Pete Maravich Assembly Center. Thousands of people were flown to the university, where the major athletic facilities were turned into vast field hospitals. O'Keefe worked with other administrators and LSU's student government to organize an army of student, staff, and faculty volunteers to help Katrina's victims with food, water, clothing, and communications. As thousands of evacuees streamed into Baton Rouge, university volunteers helped them find places to stay. O'Keefe had a brother in New Orleans who found shelter, along with others, at O'Keefe's home, which soon became filled to capacity with people and their pets. O'Keefe found himself hosting, escorting, and helping a range of public officials concerned with the public health aspects of the disaster and the university's role therein.

Photo courtesy of Jim Zietz, LSU Public Affairs

Chancellor Sean O'Keefe and U.S. Surgeon General Vice Admiral Richard H. Carmona walk outside the Pete Maravich Assembly Center at Louisiana State University.

O'Keefe simultaneously dealt with a myriad of lesser but still important issues, such as the upcoming football game with Arizona State. He arranged for it to be played in Tempe rather than Baton Rouge and for the proceeds from the game to go to Katrina relief funds. He decided to resume classes on September 6, and held a public forum with the university community commending everyone for their work to date, but warning of complications ahead as LSU accepted hundreds, maybe thousands, of displaced students from ruined campuses in New Orleans. Much was uncertain, and it would be a long while before "normalcy" returned to LSU. However, he declared, LSU was the "flagship" university of the state system and would step up to the unprecedented challenge of recovery.

As an executive, O'Keefe was getting plenty of experience leading organizations through crises.

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5. The author wishes to thank Chappell Henderson for research assistance on the case study section of this report. Ms. Henderson was a Master of Public Administration student at The Maxwell School, Syracuse University in 2004–2005. The author is grateful for support from IBM for this project. Thanks also to the National Security Program of Syracuse University and to the National Science Foundation (grant SES – 0114689), which provided support for previous research on which the author drew. The author particularly thanks Sean O'Keefe and Harold Gehman, who gave generously of their time in interviews.

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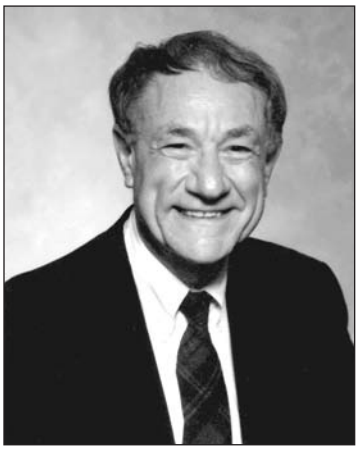

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