

National Aeronautics and Space Administration



**First
Quarter**
2005



ASAP
Aerospace Safety
Advisory Panel

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001



Aerospace Safety Advisory Panel

April 2005

The Honorable Michael D. Griffin
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Dr. Griffin:

The current members of the Aerospace Safety Advisory Panel (ASAP) were all appointed by your predecessor, Mr. Sean O'Keefe. I want to assure you that we will continue to be vigilant and will make carefully thought out recommendations to you that we believe will help NASA become safer.

This report includes the results of our first formal meeting in 2005. Panel members have also observed several key NASA activities such as the Return to Flight (RTF) Task Group Plenary Sessions, a NASA Technical Warrant Holders Workshop, an Intercenter Aircraft Operations Panel biannual meeting, and the Integrated Space Operations Summit.

We also met with key members of the RTF Task Group to discuss ways to ensure a smooth transition between the panels after the Space Shuttle returns to flight. We have agreed to actions which will ensure a smooth transition between the RTF Task Group and the ASAP.

Thank you for giving us the opportunity to serve our Nation as members of the Aerospace Safety Advisory Panel.

It is with great pleasure that I submit our first report to you, the First Quarterly Report for 2005.

Cordially,

A handwritten signature in black ink, appearing to read "J. W. Dyer", written in a cursive style.

Joseph W. Dyer, VADM, USN (Ret)
Chair
Aerospace Safety Advisory Panel



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I. Introduction



I. Introduction

This is the First Quarterly Report for the Aerospace Safety Advisory Panel (ASAP) in 2005.

NASA chartered the Panel to review, evaluate, and advise on elements of NASA's safety and quality systems, including industrial and systems safety, risk management and trend analysis, and the management of these activities.

II. Charter



II. Charter

1.0 OFFICIAL DESIGNATION

This charter sets forth the purpose for the panel officially designated as the Aerospace Safety Advisory Panel originally established under Section 6 of the National Aeronautics and Space Administration Authorization Act, 1968, as amended (P.L. 90-67, codified at 42 U.S.C. § 2477).

2.0 OBJECTIVES AND SCOPE

The Panel will review, evaluate, and advise on elements of NASA's safety and quality systems, including industrial and systems safety, risk-management and trend analysis, and the management of these activities. Priority will be given to those programs that involve the safety of human flight.

3.0 PERIOD

The Panel will perform duty for the period specified in Section 9.0.

4.0 REPORTING

The Panel will function in an advisory capacity to the Administrator, and through the Administrator, to those organizational elements responsible for the management of the NASA safety and quality activities.

5.0 PANEL ORGANIZATION AND SUPPORT

5.1 Panel Members: The Panel will consist of a maximum of nine members who will be appointed by the NASA Administrator. Consistent with the 2-year duration of this charter, members will be appointed for 2 years and could be reappointed by the NASA Administrator up to a maximum of 6 years, as originally set forth in 42 U.S.C. § 2477.

5.2 Panel Chairman: One member shall be designated by the Panel as its Chairman.

5.3 Panel Composition: The panel will be composed of recognized safety, management, and engineering experts from industry, academia, and other Government agencies.

5.4 NASA Membership: As originally set forth in 42 U.S.C. § 2477, not more than four Panel members shall be chosen from the officers and employees of the National Aeronautics and Space Administration.

5.5 Panel Support: The NASA Headquarters Office of Safety and Mission Assurance will provide a staff, comprised of full-time NASA employees, to provide support to the Panel.

6.0 PANEL DUTIES

6.1 The duties of the Panel as originally set forth in 42 U.S.C. § 2477 continue:

“The Panel shall review safety studies and operations plans referred to it and shall make reports thereon, shall advise the Administrator with respect to the hazards of proposed or existing facilities and proposed operations and with respect to the adequacy of proposed or existing safety standards and shall perform such other duties as the Administrator may request.”

6.2 Quarterly Report: The Panel shall submit quarterly reports to the Administrator. Findings that are time critical will be reported immediately.

6.3 Special Reviews and Evaluations: The Administrator may request certain special studies, reviews, and evaluations. The Panel will submit reports with comments and recommendations as deemed appropriate by the Panel to the Administrator within the timeline specified by the Administrator.



7.0 ESTIMATED ANNUAL COSTS

The NASA Headquarters Office of Safety and Mission Assurance will provide the budget for operation of the Panel. The estimated annual operating cost totals \$555,000, including 3.0 work-years for staff support.

8.0 ESTIMATED NUMBER AND FREQUENCY OF MEETINGS

8.1 Meetings: There will be four full Panel meetings each year to perform the duties as described in Section 6.0.

8.2 Special Meetings: Special meetings of the Panel may be required.

9.0 PLANNED TERMINATION DATE

Pursuant to the FACA, 5 U.S.C.App., this charter expires 2 years from approval date and can be renewed if the NASA Administrator determines that it is in the public interest in connection with the performance of Agency duties under the law and with the concurrence of the General Services Administration.

10.0 FILING DATE

This charter replaces the charter of the NASA Aerospace Safety Advisory Panel dated May 1, 2003, effective on this date.

Sean O'Keefe

Administrator

November 18, 2003

Date

III. Aerospace Safety Advisory Panel Membership



Vice Admiral Joe Dyer USN (Ret)

- Aerospace Safety Advisory Panel Chair
- Executive VP/General Manager, Military Government and Industrial Division, iRobot Corporation
- Former Commander, Naval Air Systems Command

Vice Admiral Joseph W. Dyer was commissioned through the Aviation Reserve Officer Candidate Program following graduation from North Carolina State University with a bachelor of science degree in chemical engineering. He subsequently earned a master of science degree in financial management from the Naval Postgraduate School, Monterey, CA. He received his wings in March 1971 and was selected as one of the first “Nuggets” (first tour aviators) to fly the Mach 2, RA-5C Vigilante. He flew nationally tasked reconnaissance missions in both the Eastern and Western hemispheres.

From April 1991 to December 1993, he was the Navy’s chief test pilot. From January 1994 to April 1997, he served as F/A-18 program manager, leading the engineering and manufacturing development (E&MD) effort on the new F/A-18E/F, the continued production and fleet support of the F/A-18C/D, and all F/A-18 foreign military sales. The F/A-18 program won the Department of Defense Acquisition Excellence Award and the Order of Daedalian during this period. Admiral Dyer was assigned as the Commander, Naval Air Warfare Center Aircraft Division, Patuxent River, in July 1997, and one month later assumed additional responsibilities as the Naval Air Systems Command, Assistant Commander for Research and Engineering. In June 2000, he was assigned as the Commander, Naval Air Systems Command.

Admiral Dyer is executive vice president and general manager of the iRobot Corporation’s Military Government and Industrial Division. In this position, he works closely with the U.S. Department of Defense to develop reconnaissance robots that will change the way wars are fought in the future.



Dr. Dan Crippen

- Former Director, Congressional Budget Office
- Member, NASA Stafford-Covey Return to Flight Task Group

Dr. Dan Crippen has a strong reputation for objective and insightful analysis. He served, until January 2004, as the fifth Director of the Congressional Budget Office. His public service positions also include Chief Counsel and Economic Policy Adviser to the Senate Majority Leader (1981-1985); Deputy Assistant to the President for Domestic Policy (1987-1988); and Domestic Policy Advisor and Assistant to the President for Domestic Policy (1988-1989), where he advised the President on all issues relating to domestic policy, including the preparation and presentation of the federal budget. He has provided service to several national commissions, including membership on the National Commission on Financial Institution Reform, Recovery, and Enforcement.

Dr. Crippen has substantial experience in the private sector as well. Before joining the Congressional Budget Office, he was a principal with Washington Counsel, a law and consulting firm. He has also served as executive director of the Merrill Lynch International Advisory Council and as a founding partner and senior vice president of The Duberstein Group.

Dr. Crippen received a bachelor of arts degree from the University of South Dakota in 1974, a master of arts from Ohio State University in 1976, and doctor of philosophy degree in public finance from Ohio State in 1981.

Note: Dr. Rosemary O'Leary stepped down from the Panel in December 2004. On January 31, 2005, NASA Administrator Sean O'Keefe announced his selection of Dr. Amy Donahue to replace Dr. O'Leary as a member of the Aerospace Safety Advisory Panel.



Dr. Amy Donahue

- Assistant Professor, Public Administration, Department of Public Policy, University of Connecticut
- Member, NASA Stafford-Covey Return to Flight Task Group

Dr. Amy K. Donahue is assistant professor of public policy at the University of Connecticut, where she teaches in the master of public administration and master of survey research programs. Her research focuses on the productivity of emergency services organizations and the nature of citizen demand for public safety services. She is the author of published work about the design, management, and finance of fire departments and other public agencies. For the past 2 years, Dr. Donahue has served as a technical advisor to the Department of Homeland Security's Science and Technology Directorate, helping to develop research and development programs to meet the technological needs of emergency responders. From 2002 to 2004, Dr. Donahue served as senior advisor to the Administrator for Homeland Security at the National Aeronautics and Space Administration (NASA). She was the agency's liaison to the Department of Homeland Security and the Homeland Security Council and identified opportunities for NASA to contribute to homeland security efforts across the government. In 2003, Dr. Donahue spent three months in Texas helping to manage the Columbia recovery operation, an intergovernmental response that involved 450 organizations and 25,000 responders. Prior to her affiliation with the University of Connecticut, Dr. Donahue was a senior research associate at the Alan K. Campbell Public Affairs Institute at Syracuse University. She also has many years of training and field experience in an array of emergency services-related fields, including managing a 911 communications center and working as a firefighter and emergency medical technician in Fairbanks, Alaska and upstate New York. As a Distinguished Military Graduate of Princeton's Reserve Officer Training Corps, she served in the U.S. Army on active duty for four years in the 6th Infantry Division, rising to the rank of captain. Dr. Donahue holds her Ph.D. in public administration and an M.P.A. from the Maxwell School of Citizenship and Public Affairs at Syracuse University. Her B.A. from Princeton University is in geological and geophysical sciences.



Dr. Augustine Esogbue

- Professor and Director, Intelligent Systems and Controls Laboratory, School of Industrial and Systems Engineering, Georgia Institute of Technology

Professor Esogbue joined the faculty of the Georgia Institute of Technology (Georgia Tech) in June 1972 as an associate professor of industrial and systems engineering under a joint appointment with the Health Systems Research Center. Since his promotion in 1977 to full professor, with tenure, in the School of Industrial and Systems Engineering at Georgia Tech, he has held many leadership positions including the director of the Intelligent Systems and Controls Laboratory, and founder and director of Minority Undergraduate Scholars Engineering Research Program (MUSERP). Professor Esogbue holds the prestigious position of honorary professor at Daqing Petroleum Institute, Heilongjiang Province, China. Professor Esogbue was formerly Chancellor's Distinguished Professor of industrial engineering and operations research and management sciences at the University of California, Berkeley, and an assistant professor of operations research and member of the Systems Research Center at Case Western Reserve University in Cleveland, OH. Additionally, he has held honorary appointments as adjunct professor in community medicine, Morehouse School of Medicine, and in the Department of Mathematical and Computer Sciences, Atlanta University; Columbia University Seminars in Pollution and Water Resources faculty; and professor in residence at Howard University.

Professor Esogbue is the author of 4 books, 18 book chapters, over 150 technical publications, and nearly 300 technical presentations worldwide. In recognition of his accomplishments, he has been elected Fellow of the following organizations: the American Association for the Advancement of Science (AAAS), the Institute of Electrical and Electronic Engineers (IEEE), the Nigerian Academy of Sciences (NAS), the African Scientific Institute (ASI), and the Kerr L. White Institute for Health Services Research (KLWI). Professor Esogbue was honored as the first recipient of the Golden



Torch Award for Lifetime Achievement in Education given by the National Society of Black Engineers, the premier award recognition for African Americans in science, engineering, and technology. Dr. Esogbue was also named as the first recipient of the Andrew P. Sage Best Paper of the Year Award, given by IEEE Systems, Man, and Cybernetics Society, in 1999. His accomplishments are chronicled in several *Who's Who* publications including *Who's Who in the World*, *International Who's Who in Engineering*, *American Men and Women of Science*, *Who's Who in Technology*, *The International Directory of Distinguished Leadership*, *International Who's Who of Intellectuals*, and *Who's Who Among African Americans*.

His research and consulting interests include dynamic programming, fuzzy sets, decisionmaking and control in a fuzzy environment, and operations research with applications to sociotechnical systems such as health care, water resource management, and disaster control planning. As the director of the Intelligent Systems and Controls Laboratory, he is investigating a hybrid approach to intelligent control via fuzzy sets, neural networks, and reinforcement learning theories as well as its application to various large-scale, nonlinear, and uncertain dynamical systems. He has conducted numerous funded research projects for various agencies including NSF, EPRI, NASA, Agency for Health Research and Quality (AHRQ), Army Research Office (ARO), and NIH. Current applied research activities are directed at patient safety enhancement via systems technology imperatives.

Dr. Esogbue has a record of prolonged service to various communities including the National Society of Black Engineers (National Advisor since 1989), Atlanta Sister Cities Commission (Commissioner since 1975), Leadership Atlanta Development Corporation (Leadership Atlanta, 1979), Georgia Council on International Visitors (Trustee, 2001), Georgia Goodwill Ambassador Corps (Outstanding Citizen, 2001), the Georgia Tech Athletic Board (Trustee, 2000), and 100 Black Men of America, Inc. (1990, Chair, Collegiate 100).



Major General Rusty Gideon, USAF (Ret)

- Former Commander, Air Force Safety Center and Chief of Safety for USAF

Major General Francis (Rusty) C. Gideon, Jr., graduated from the U.S. Air Force Academy in 1966 with a bachelor of science degree in engineering sciences. He also earned a master of science degree in systems management from the Air Force Institute of Technology.

General Gideon was the Chief of Safety of the U.S. Air Force, and Commander, Headquarters Air Force Safety Center, Kirtland Air Force Base, NM. He served as the senior uniformed adviser to the Chief of Staff and the Secretary of the Air Force on all issues involving the safety of a combined active duty, guard, reserve, and civilian force of more than 700,000 people serving approximately 2,300 locations in the United States and overseas.

His career has touched many aspects of the Air Force mission as fighter pilot and experimental test pilot, and in acquisition, intelligence, and logistics. His assignments spanned the globe from Thailand to England. He commanded one of the Air Force's three test wings and its center for scientific and technical intelligence. He is a command pilot with almost 3,000 hours flying in 30 kinds of aircraft. He was a A-10 test pilot and flew 220 combat missions in Southeast Asia in F-100s and F-4s.



Ms. Deborah Grubbe, P.E.

- Former consultant, Columbia Accident Investigation Board
- Vice President, Group Safety; BP p.l.c.
- DuPont Corporate Director, Safety and Health (retired)

Ms. Deborah L. Grubbe is vice president, Group Safety, for BP p.l.c. Based in London, she is accountable for providing global safety leadership in all business areas—exploration and production, refining and marketing, gas, solar, and renewables. Formerly, Ms. Grubbe was employed by DuPont in Wilmington, DE, where she held corporate director positions in safety, operations, and engineering. Her many assignments have included capital project implementation, strategic safety assessments, manufacturing, management, and human resources.

Ms. Grubbe earned a bachelor of science degree in chemical engineering from Purdue University and was a Winston Churchill Fellow at the University of Cambridge, England. She is the former cochair of the Benchmarking and Metrics Committee of the Construction Industry Institute, and is vice chair of the National Institute of Standards and Technology Visiting Committee on Advanced Technology. As part of the National Research Council, she has also advised the U.S. Army on the demilitarization of the U.S. chemical weapons stockpile. In 2002, Ms. Grubbe was honored as Engineer of the Year in the State of Delaware.



Mr. John C. Marshall

- Independent Aviation Consultant
- Former Vice President, Corporate Safety and Compliance, Delta Airlines

Mr. John C. Marshall is an independent aviation consultant who formerly was vice president, Corporate Safety and Compliance, for Delta Air Lines. Mr. Marshall had responsibility for six departments at Delta, including Flight Safety, Industrial Safety, Environmental Services, Emergency Planning and Operations, Safety Analysis and Quality Assurance, and Security. Inherent in these organizations are FAA, DOT, DOD, OSHA, EPA, TSA, and DHS compliance-driven programs for accident prevention, accident investigations, accident response, and a wide range of security programs. He also had collateral responsibilities for integrating safety, compliance, and security programs for Delta's wholly-owned subsidiaries, including Comair, Atlantic Southeast Airlines, Delta Global Services, and Delta Technologies, into Delta's mainstream programs. Under his leadership, Delta routinely was recognized for industry-leading programs focused on reducing aircraft mishaps, employee injuries, and aircraft ground damages, while enhancing environmental compliance programs and fostering the highest standards of security for worldwide commercial airline operations.

Mr. Marshall recently served as the industry cochair of the Commercial Aviation Safety Team (CAST). CAST is a joint industry-government program to develop and implement an integrated, data-driven strategy to reduce the U.S. commercial aviation fatal accident rate by 80 percent by 2007. Participants include aircraft and engine manufacturers, passenger and cargo airlines, labor unions, Flight Safety Foundation, the Air Transport and Regional Airline Associations, NASA, DOD, and the FAA. Mr. Marshall is also the past chairman of the Air Transport Association of America's Safety Council and the Society of Automotive Engineer's Aerospace Symposium. He currently serves on boards for the National Defense Transportation Association's Military Subcommittee, Safe America (a Nationwide, nonprofit organization focusing on safety awareness), the Flight Safety Foundation, and the Nature Conservancy's International Leadership Council.



III. Aerospace Safety
Advisory Panel
Membership

Mr. Marshall gained worldwide aviation experience through his 26-year aviation career with the U.S. Air Force. His Air Force assignments included duties as a fighter pilot, Special Assistant to the Air Force Vice Chief of Staff, fighter squadron commander, base commander, and fighter wing commander. During his career, he primarily flew F-4s, F-15s, A-10s, and F-16s, but has experience in a variety of other aircraft as well. Mr. Marshall later served as the Inspector General of the Pacific Air Forces and then became the Director of Operations of the Pacific Air Forces. While in the Pacific, he oversaw the safe and efficient operations of over 400 combat aircraft, including developing plans and policies used for executing his command's annual flying program. In his last assignment, he served as the United State's Director of Security Assistance for the Middle East where he was responsible for all sales, marketing, training, and logistic support between the United States and 11 countries in the Middle East, Africa, and Southwest Asia during and immediately after the Gulf War.

Mr. Marshall received his bachelor's degree in civil engineering from the Air Force Academy in Colorado. He also is a graduate of the National War College, holds a master of arts degree in personnel management from Central Michigan University, and a master of science degree in civil engineering (environmental) from the University of Hawaii.



Mr. Steve Wallace

- Former Member, Columbia Accident Investigation Board
- Director, Office of Accident Investigation, Federal Aviation Administration

Mr. Steven B. Wallace was named Director of the Federal Aviation Administration (FAA) Office of Accident Investigation in May, 2000. He has overall responsibility for FAA accident and incident investigation activities, related training and quality control programs, and implementation of corrective measures based on investigation findings.

From 1991 to 2000, Mr. Wallace was the FAA's senior representative at the U.S. Embassy in Rome, Italy, serving as the principal FAA contact for civil aviation authorities and the aviation industry in a 29-country geographic area spanning Central Europe, the Mediterranean, and the Middle East.

From 1984 to 1991, Mr. Wallace was manager of the FAA's Transport Airplane Directorate Standards Staff in Seattle, a group of engineers, pilots, and technical writers responsible for developing requirements for certification of transport aircraft.

Mr. Wallace began his FAA career as an attorney in the New York (1976-79) and Seattle (1979-84) regional offices. He holds a bachelor of science degree in psychology from Springfield College, a Juris doctor degree from St. John's University School of Law, and is admitted to legal practice before New York State and Federal courts. A licensed pilot since 1977, Mr. Wallace holds a commercial pilot's license with multiengine and instrument ratings.



Mr. Rick Williams

- Alcoa Corporate Safety Director

Mr. Rick E. Williams is corporate safety director at Alcoa, responsible for developing strategies to improve the company's global safety performance, while also providing technical support and guidance on safety issues to Alcoa business leaders. In this role, he also shares the Alcoa safety experience with customers and other external organizations.

Mr. Williams has over 25 years of experience in manufacturing including roles in operations, human resources, safety, and community and government affairs. He has served in plant, business unit, and corporate assignments. Prior to his current assignment, Mr. Williams was the director of human resources for Alcoa Primary Metals located in Knoxville, TN. In this role, he led the integration efforts of both the Alumax and Reynolds acquisitions into the Alcoa Primary Metals organization. Prior to that, he served as vice president of human resources for Alumax Primary Metals in Norcross, GA.

Mr. Williams graduated from the University of Maryland with a bachelor's of science degree in business in 1976. He later continued his studies at the University of Maryland, and, in 1994, he received a master of government and administration degree in human resources.



Brigadier General Joe Smith, USA, Ex-Officio Member

- Commander, Army Safety Center and Director of Army Safety
- Former Assistant Division Commander (Support), 82nd Airborne Division, Operation Iraqi Freedom, Iraq
- Former Chief of Staff, 10th Mountain Division (Light Infantry), Operation Enduring Freedom, Afghanistan

Brigadier General Joseph A. Smith is currently serving as both the Director of Army Safety on the Special Staff of the Chief of Staff, U.S. Army and as Commander of the U.S. Army Safety Center, Ft. Rucker, AL. A Master Aviator with over 2500 flight hours, BG Smith is qualified in the UH-1 Iroquois, UH-60 Blackhawk, MH-60K, OH-58D, and the MH-6 Scout aircraft.

BG Smith has served extensively in Army Air Assault, Airborne, and Special Operations units, including company-level aviation command in both the 101st Airborne Division (Air Assault) and the 160th Special Operations Aviation Regiment (SOAR) (Airborne); battalion-level aviation command in both Panama and with the 160th SOAR; and brigade-level command with the 10th Aviation Brigade, 10th Mountain Division (Light). BG Smith has served combat tours in Operation Just Cause (Panama), Operation Desert Storm (Kuwait and Iraq), Operation Enduring Freedom (Afghanistan), and Operation Iraqi Freedom (Iraq). He has also served as the Deputy Chief of Staff for Aviation for the United States Special Operations Command and has peacekeeping experience with Operation Joint Forge (SFOR 6) in Bosnia.

IV. First Quarterly Meeting Minutes



National Aeronautics and Space Administration

AEROSPACE SAFETY ADVISORY PANEL PUBLIC MEETING

January 27, 2005

**Florida Space Authority
Cape Canaveral, Florida**

MEETING MINUTES

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Mark D. Erminger
Executive Director

A handwritten signature in black ink, appearing to read "Joe Dyer". The signature is written in a cursive, somewhat stylized font.

VADM Joseph W. Dyer, USN (Ret)
Panel Chair

**AEROSPACE SAFETY ADVISORY PANEL (ASAP)
PUBLIC MEETING**

January 27, 2005

**Florida Space Authority
Cape Canaveral, Florida**

Panel Attendees

VADM Joseph W. Dyer, USN (Ret), Chair

Dr. Dan L. Crippen

Dr. Amy K. Donahue

Dr. Augustine O. Esobue

MG Francis C. Gideon, Jr., USAF (Ret)

Ms. Deborah L. Grubbe

Mr. John C. Marshall

Mr. Steven B. Wallace

Mr. Rick E. Williams

Mr. Mark D. Erminger, Executive Director

Panel Members Not in Attendance

BG Joseph A. Smith, U.S. Army, Ex-Officio Member

Members of the public were given the opportunity to submit comments in writing to the Panel prior to the start of the meeting. No members of the public submitted any written comments.



INTRODUCTION

Vice Admiral Joseph Dyer introduced himself and welcomed the participants.

OPENING COMMENTS

Vice Admiral Dyer started out by saying that it was the 1-year anniversary for the current ASAP and explained that the purpose of the meeting was to share a report of the Panel's last two and a half days at Kennedy Space Center (KSC). He asked each of the Panel members to introduce themselves. He also introduced the newest Panel member, Dr. Amy Donahue. Dr. Donahue replaced Dr. Rosemary O'Leary who recently accepted another position in the Western Pacific.

Vice Admiral Dyer provided highlights of the Panel's meetings at KSC and of the Panel's activity since the last quarterly meeting.

Vice Admiral Dyer acknowledged the Panel's appreciation for the strong leadership that Mr. Sean O'Keefe has given NASA. Under Mr. O'Keefe's leadership several important initiatives are well on their way to completion.

Independent Technical Authority (ITA) has been the highest priority for ASAP. Specifically, ITA is used when an issue requires a waiver or a deviation. ITA answers the question of whether it is safe to proceed. ITA is a process that includes the identification of individuals as warrant holders. It is a significant cultural shift in that it transitions from functional or organizational responsibility to individual accountability with associated responsibilities and authorities. ASAP is very pleased with the progress that NASA has made with ITA, and Vice Admiral Dyer noted the strong support from Rear Admiral Walt Cantrell, formerly a member of ASAP, in the ITA effort.

KSC OVERVIEW

After providing opening remarks, Vice Admiral Dyer addressed the first topic, which was the Panel's discussion with the KSC Center Director, Mr. Jim Kennedy.

Mr. Kennedy gave a good overview of what it takes to make KSC function. KSC has 14,000 employees—2,000 government employees and 12,000 contractors, and a \$1.6 billion contribution to the local payroll. Mr. Kennedy has certainly aligned his leadership with NASA's vision. His briefing and every briefing that the Panel attended started out with a genuine discussion of NASA's heritage. This is an indication of good culture taking strong root.

KSC senior leadership was properly focused on the Space Shuttle as the number one priority. There was a clear understanding that the activity was milestone-driven and not schedule-driven. In other words, the schedule will not force taking unacceptable risks. KSC is preparing two Space Shuttles for the next flight because of the potential need for a rescue in case there is a problem with the first Space Shuttle. There is a tremendous amount of activity and people are energetically engaged, but not rushing. The Panel tries to be sensitive to and perceptive of subtle things when observing NASA activity. Expeditious but measured pace is one of the things that the Panel noted at KSC.

The International Space Station (ISS) is 40 percent complete. Modules are in place at KSC to bring the ISS to 75 percent completion. The ISS is one of the strongest examples and best case studies of logistics management.

The ASAP has a very positive report on KSC.

ITA

Mr. John Marshall discussed the Panel's review of ITA with NASA Chief Engineer Mr. Rex Geveden.

Mr. Marshall noted that the session was very helpful, and he applauded the continuing progress NASA has made in addressing this difficult issue. As noted previously, ITA has been a top-priority of the ASAP from the time this panel began its deliberations. Of course, the review and independence of NASA's ITA process are in direct response to



Columbia Accident Investigation Board (CAIB) finding 7.5-1 to reexamine the use, utility, and vitality of ITA.

Mr. Marshall recalled that the Panel previously made two recommendations regarding ITA. In April 2004, the ASAP noted that ITA is critically important if there are to be safe and reliable operations in the missions ahead and asked the Chief Engineer to perform an analysis of ITA. A second recommendation was made in November 2004 that NASA should implement its new approach to ITA prior to the Space Shuttle's next launch. In making this recommendation, the ASAP acknowledged that a significant investment in energy and effort would be required from senior NASA leaders, but that the ASAP believed the reward would be worthy of the effort.

The ASAP noted that continued support from the NASA Administrator, whomever that may be in the future, is critical for continued progress to be made fielding this concept NASA-wide. In this regard, the ASAP gives Mr. O'Keefe a lion's share of the credit for standing up and insisting that ITA be embraced Agencywide. Nevertheless, a challenge for the future will be to get the new Administrator on board quickly.

Mr. Marshall addressed some of the details of the ITA program, noting that the Chief Engineer has begun the screening process to identify people across NASA who will hold the warrants. He noted that the warrants are separated into two general areas: system warrants on major programs such as the orbiter, the launch vehicle, and the International Space Station; and technical warrants for disciplines such as electrical systems, environmental control, thermal protection, and power systems. Most recently, the Engineering Management Board has identified approximately 70 areas which require warrant holders, although they anticipate this number to increase to as many as 150 in the future. To fill these positions, the Chief Engineer is going through a process to determine who is the best qualified to hold the warrant authority and then assigning the warrants. So far, the Chief Engineer has identified 25 warrants and issued them to 18 people.

Mr. Marshall also reported that the ASAP identified other areas of equal importance regarding fielding an effective ITA program that requires further definition. These include identifying: specifications to be used, standards that will be needed to successfully implement the warrants, interfaces required for interagency coordination, examining the concept of the use of trusted agents, and determining how warrant holders are expected to prioritize their day-to-day workloads. At issue is how to use warrant holders still embedded in their original organizations while sustaining their autonomy.

There was some discussion by Panel members regarding identification of the remaining warrants, an assessment as to whether NASA has focused on the right areas, the cultural changes that need to be made to embrace the revised ITA concept, and sustaining technical conscience throughout the Agency.

As did Vice Admiral Dyer, Mr. Marshall singled out one of the former ASAP members, Rear Admiral Walt Cantrell, for his vision and focus in helping NASA formalize the processes that are now being implemented across the Agency. He also noted Mr. Geveden had briefed NASA's Operations Council, which endorsed the concept, updated seven Center Directors and their senior staffs, and recently completed a Leader-led Workshop for the initial class of warrant holders.

Many of the Panel members reaffirmed their satisfaction with the progress that NASA has made, but agreed there remains a lot of work to do in this area. All panel members agreed that the directions NASA had chosen to pursue addressing ITA were on the mark. Finally, the Panel acknowledged that the challenge before NASA is to sustain the progress made. In this regard, the ASAP continues to be optimistic and believes this is achievable.

Vice Admiral Dyer commented that ITA certainly brings a balance of influence between programs and functional or technical issues. He further agreed that NASA has made significant progress addressing and resolving issues dealing with ITA over the past six months. Finally, he noted that the ASAP is very positive about ITA.



NASA BUDGET

Dr. Austin Esogbue discussed the Panel's review of the NASA budget process.

Mr. Doug Comstock, Acting Deputy Comptroller, discussed the budget process with the Panel. It was very heartening to learn that NASA has done as much as it possibly can to ensure that the budget process was smooth.

The Comptroller discussed the four NASA values and described how they drive everything NASA does. The NASA budget process recognizes the importance of budget on safety, and NASA does everything possible to minimize the impact of the budget process on risk associated with its operations.

The NASA Family value is used as a vehicle to ensure that proper working relationships develop with the decisionmakers who impact the budget.

The NASA value of Excellence ensures that NASA institutes an appropriate budgeting process with high integrity that uses the most up-to-date financial management system that is technologically driven.

In the fourth value, Integrity, NASA makes every effort to create credibility with its stakeholders. NASA instituted improved systems in cost-estimating and identifying early warning signals.

It seems that NASA is ahead of the other Government agencies in institutionalizing the budget process.

The ASAP felt comfortable with NASA's approach to budget.

It was very interesting to understand the dynamics between NASA, the White House, the Office of Management and Budget, and Congress. There are several iterative processes that NASA has to go through before a final budget is approved. All of that feeds into the execution of NASA tasks. There are three stages of budgeting: formu-

lation, justification, and execution. NASA must be fully involved to articulate its position to make sure that everyone understands NASA's missions and needs.

In developing a new budget formulation, NASA makes sure that new projects are not shortchanged. NASA uses a full-cost budget process to make sure projects are balanced, defensible, and executable. It also has another dimension that involves institutional review to identify possible impacts to the NASA strategic plan. There is a formal process to identify issues that are well-documented and tracked.

The ASAP is concerned with making sure that the new process that protects programs like the ITA and Safety and Mission Assurance (SMA) are safety-centric. The Panel has some degree of comfort that the budget will protect these important aspects of NASA safety-driven activities.

The ASAP felt comfortable with the process that NASA uses to manage the budget.

Vice Admiral Dyer commented that budget is certainly one of the leading indicators of the seriousness with which NASA is addressing safety. It bears close watching by ASAP and the leadership but at this point in time, ASAP feels the safety initiatives are well-supported and properly funded.

NASA CHANGE MANAGEMENT

Ms. Deborah Grubbe discussed how NASA manages change at the Agency level.

At the last meeting, the ASAP discussed the NASA change management process with the Deputy Administrator. Any organization that goes through a lot of change all at one time needs to make sure that change is well-coordinated and well-thought-out. At this meeting, the Panel learned about the existing change management process.

The process is very well aligned with existing core values and builds upon work that was started before the Columbia accident called "One NASA." The focus of the change management process is transformational change. How does the organization make a



step change in areas where needed while at the same time holding onto the things that are important for it to continue doing well? This effort is led out of the Administrator's office and is focused on defining and integrating various aspects and elements of change.

There are four elements of change:

1. What are you trying to change? What are the areas of change?
2. How do you report and track change?
3. How do you lead change?
4. How do you communicate change?

There are three key areas of change:

1. Maintaining technical excellence
2. Organizational excellence
3. People excellence

The three key areas of change are not separate and distinct; they overlap each other.

How do you lead change?

1. Communicate clearly.
2. Engender employee support.
3. Continue to build management credibility and trust.
4. Continue and build on open decisionmaking.

That is all good theory but where is NASA? When you look at clear communication, NASA has started a second round of large group meetings at all ten Centers. This follows the first round of large group meetings that happened a while ago and a series of private sessions conducted throughout the organization. This communication has been going on over the last several months. All of the organizations have an ombudsman that can listen and hear confidential comments and feed them to the right places if the individuals feel constrained. NASA established hot lines and anonymous web sites where people can post questions to facilitate more open com-

munication. These are just examples of many ways to use multiple media methods to begin and continue to open up the culture.

KSC FACILITIES

Mr. Rick Williams discussed the Panel's review of KSC facilities.

The Panel was particularly interested in seeing the facilities for a number of reasons: to understand the hurricane damage recovery and repair, to understand the progress on return to flight (RTF) actions, and to review the infrastructure work going on at KSC.

The Panel had the opportunity to see facilities and also to talk to people who worked in every place that they visited. The ASAP reviewed the Orbiter Processing Facility, the Vehicle Assembly Building, the Firing Room, the launch pad, the crawler transporter, and the Space Station Processing Facility (SSPF). Workers we spoke to had positive attitudes, looked forward to upcoming challenges, and recognized that there is still work to do but did not have any sense of being overwhelmed.

The ASAP saw construction contractors doing infrastructure work above and beyond what the typical prime contractors do on site. Overall, the Panel was pleased with what it heard and saw. The amount of contractor work at the moment is an issue that KSC recognizes and is taking steps to manage.

FACILITY READINESS FOR RTF

Major General Rusty Gideon discussed the Panel's review of KSC facility readiness for RTE

The Panel reviewed the KSC Certificate of Flight Readiness (CoFR) process and the actual status of facilities to support RTE

The ASAP felt the CoFR process is a good process and meets the Space Shuttle Program's (SSP's) needs. It is well documented, it is logical, and it is timely. There is a



schedule where each facility is certified and that schedule is well integrated with the SSP Manager's schedule. The facility reviews match up with each other and all lead up to the final Flight Readiness Review that occurs two weeks before launch. The ASAP has no particular recommendations about the process.

The second review was of the status of the major facilities that support the launches. The ASAP was impressed with the rapid response to and repair of hurricane damage at several of the major facilities. Some of that repair work is still ongoing but the facilities will be ready in time to support the next launch.

The Panel believes that NASA has wisely used the time made available because of the Columbia accident. NASA has been doing a lot of preventive maintenance and improvements to the facilities to take advantage of the down time.

NASA is on track to support the next launch.

The ASAP also got the distinct impression that the facilities managers would not hesitate to say they were not ready to go if there was a facilities problem. The Panel did not feel they were schedule-driven, and believe safety would not be compromised.

International Space Station (ISS)

Dr. Donahue discussed the Panel's review of the ISS systems status.

It was very exciting to see the Space Station Processing Facility. Almost all of the ISS hardware is in place and ready to go on orbit.

The ISS Program updated the Panel on the Expedition 10 crew and on-orbit systems status.

The Panel discussed three systems that have experienced problems. These were:

1. The food shortage that occurred last fall: The Panel learned that comprehensive food audits are very time-consuming, so assumptions are routinely made. The crew

had over-estimated how much food they had as well as the mixture of rations. The ISS Program understands what caused the problem and has put corrective action in place, including closer communications with the crews and agreements with the Russians about rationing and consumption.

2. Torque buildup: The ISS has been trying to understand what is causing a disturbance torque during extravehicular activity in the Russian Orlan suits. Although they do not understand what is causing the torque, the ISS is able to maintain attitude control.

3. The Elektron functioning: The Elektron experienced a number of failures last fall and was repaired. It then saw additional shutdowns in January. It is now operating on a backup pump.

The Panel also remarked that the ISS has learned some important design philosophy lessons that will benefit future exploration plans, particularly in the areas of systems redundancy, logistics, and how to refurbish on-orbit.

The ISS Program has developed an emergency plan for a Contingency Shuttle Crew Support (CSCS) (safe haven) aboard the ISS. The safe-haven capability is a NASA decision and not a CAIB recommendation. ISS has identified a best-case and a worst-case capability to support the Space Shuttle crew on orbit for an extended stay in case of an emergency. The ISS also identifies the most likely circumstances, using their best engineering judgment to estimate a likely available CSCS duration. Currently that duration is 45 days. NASA can launch a rescue mission for STS-114 in 33 days.

Vice Admiral Dyer said that in commercial and military aviation, there are two debates on logistics: Should you do time-based (preventive) maintenance or wait until it breaks? These two options are playing out in real-time on the ISS.



KSC SMA

Mr. Steve Wallace discussed the Panel's review of KSC SMA.

KSC has made major changes in their SMA organization.

KSC briefed the Panel on their overall SMA organization, safety metrics, and Close Call Program. KSC discussed how they differentiated between a hazard and a close call. The Panel is happy to see that KSC is working on combining both categories and reporting them all as close calls.

KSC also briefed the Panel on the SMA CoFR process and range safety. The range safety discussion also included landing range safety which was one of the CAIB observations to protect the public on entry.

Ms. Grubbe added that the Panel was encouraged that NASA was benchmarking industry on how they manage subcontractor safety. She said that there is a relationship between slips, trips, and falls and system safety.

Mr. Williams added that KSC identified issues with subcontractor safety by reviewing their safety metrics. KSC is just now moving toward combining their hazards and close calls. This is good that NASA is moving toward a standardized approach. NASA should strive to be consistent and drive out the situations where there is no cause to be different.

Mr. Marshall said that on a wide range of topics, the Centers have developed their own programs. The Panel continues to see opportunities for standardization. This is an area that the ASAP would like to look into further.

SSP PLANNING FOR LAST FLIGHT

Dr. Dan Crippen discussed the Panel's review of the SSP's planning for the last Space Shuttle flight.

NASA Headquarters will have to make some of the decisions on planning for the last Space Shuttle flight.

NASA has not shut down a major program since Apollo. There will be a number of things that NASA will need for follow-on programs. Some capability still needs to be preserved. The Panel has several concerns about NASA's ability to keep people in the SSP and maintain the core competencies that are necessary to keep the Program running safely until the last flight.

The demographic bulge is coming. Government employees can retire early and many are already eligible. We also have a Russian partner that has the same issue. This subject will continue to be of interest to NASA. How do we maintain core competencies and how do we restructure current contracts to maintain the proper skill base all the way to the last Shuttle flight?

The SSP is in the exploratory phase right now and the next phase will be done in mid-2005. NASA needs a plan to maintain competency. NASA may want to think about assigning someone organizationally outside the SSP to manage the decisions required to shut down the Program.

CREW EXPLORATION VEHICLE (CEV)

Vice Admiral Joe Dyer discussed the Panel's review of the CEV Program.

Vice Admiral Dyer was happy to report that safety is up front and a pillar of the CEV Program. The next vehicle will take humans to the Moon, Mars, and beyond. The first human flight will be in 2014. The next spiral will be to the Moon and then beyond in the third spiral. The draft Request for Proposal is out for review and the Exploration Program is planning to award a contract in the fourth quarter of fiscal year 2005.

PROBABILISTIC RISK ASSESSMENT (PRA)

Ms. Grubbe discussed the Panel's review of PRA.



There are several types of risk: schedule risk, safety risk, technical risk, and financial risk. The ASAP only focused on safety and technical risk.

There are many different ways to measure risk. There are different tools to measure and analyze risk like fault tree analysis, failure modes and effects analysis, PRA, hazard and operability studies, what if, checklists, etc. These tools are all different. Sometimes it is better to use one kind of tool in a certain situation over another kind of tool. You can always argue over which tool is the best tool for any particular situation. When you look at risk, you are dealing with uncertainty. There is randomness around the model. The same equations do not always fit for every situation. The models themselves have a level of uncertainty.

The ASAP reviewed the tools that NASA has used over the years to manage, measure, and analyze risk. The capability of these models have continued to evolve as technology has improved. The CAIB discussed PRA but did not make any formal recommendation. PRA is a step above fault tree analysis in complexity.

There are three events that can lead to an incident: initiating event, pivotal event, and the actual end-state. There are several kinds of analysis that you need to do when performing a PRA: detailed technology information on the systems, logic diagrams, event sequencing, and failure history data. These are the kind of things you need to build a PRA. PRA can help your decisionmaking, but the models have to be right. There are significant cautions: the numbers are not always good because of levels of uncertainty, and the tool is not precise. PRA is better used when the situation is discrete and limited in scope. It is meaningless to string together different kinds of models with different levels of precision. It is more useful to compare similar models. If you are going to use PRA, you need to use it in the way for which it was designed. PRA can be used to compare relative risk on similar systems.

The ASAP did a lot of learning. NASA is using PRA and needs to make sure it is using PRA for its intended purpose.

Dr. Crippen commented that the Stafford-Covey RTF Task Group has a concern with the use of analytical models and the appropriate use of models. Models are clearly helpful in almost every endeavor. Models are only as good as their assumptions. Across different models you have different quality of assumptions. Some models have data to back them up, some have theory, and some do not have much of anything. You have to be careful. The Columbia accident was the result of two wrong-held faulty assumptions: the ballistic momentum of foam and how the aerodynamics of the Shuttle worked. Those two faulty assumptions were, in essence, proven over 100 flights, but they were still wrong. The trick in an analytical organization is to get people to test their assumptions, especially after they have held them for a long time and they seem to have been proven right.

It is the inappropriate use of models that can cause trouble. The PRA model was clearly developed to make assessments between two alternatives. PRA can be misused to add up disparate numbers to try to make something of the totals. It could be useful in some limited situations, but only if you understand the limitations very clearly. One of the numbers that came out after the Columbia accident was that there was something like a 1/250 chance of mission failure. That is a totally inappropriate use of PRA and the number itself. The ASAP's concern is that NASA does not continue to misuse or misrepresent numbers that are not quite accurate or are misleading.

Dr. Donahue added that neither the RTF Task Group or ASAP is saying to not use models. Decisionmakers should have qualitative and quantitative data to make decisions. A suite of tools is appropriate and PRA is one of those tools. The concern is to use the numbers appropriately and to not publish numbers that are not meaningful. NASA has done exceptional work on PRA over the last 5 years, and it really is an impressive model.

CONCLUSION

Vice Admiral Dyer thanked the leadership of the Florida Space Authority for allowing the ASAP to hold the public meeting in their facility.



MEETING ADJOURNED

Vice Admiral Dyer adjourned the meeting and opened the floor to questions from the public participating in the meeting.

V. Recommendations

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001



Aerospace Safety Advisory Panel

March 18, 2005

The Honorable Frederick D. Gregory
Acting Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Mr. Gregory:

The Aerospace Safety Advisory Panel will be making three recommendations to you in our 2005 First Quarterly Report.

1. Safety—NASA has done a good job using employee awareness of lost workday cases to improve their overall safety record. Today, lost workday cases are “reasonably rare.” To continue this improvement trend, NASA should increase standardization of reporting processes and communication mechanisms at each Center and across the Agency, especially in the area of employee awareness of first aid cases, recordable injuries, and close calls. Management focus, when turned on close calls and minor injuries, will support safer individual workplaces and facilities.

2. Kennedy Space Center (KSC) Safety for Prime Contractors and Subcontractors—KSC should develop and execute a plan to improve prime contractor and subcontractor safety performance on site. This plan could include the following: an outline of the role of the NASA employee in ensuring strong prime contractor and subcontractor safety performance, the specific safety criteria required before a contractor is allowed on site, and a review of the contractor’s past injury and incident rates. The plan should include an outline of repercussions if safe behavior is not demonstrated, as well as recognition for strong safety behaviors. The plan needs to outline potential ramifications to employees and contractors for deliberately failing to report close calls, other safety incidents, and potential injuries.

3. KSC Safety for NASA Employees—KSC should emphasize adherence to existing safety rules on the Center, address education and training needs as staffing and pace increase to support more frequent launch operations, and increase employee awareness of safety in the facility in which they work. Increased employee awareness would include knowledge of unique safety rules and awareness of prior accidents or injuries in that facility.

Cordially,

A handwritten signature in black ink, appearing to read "J. W. Dyer". The signature is written in a cursive style with a large initial "J" and "W".

Joseph W. Dyer, VADM, USN (Ret)

Chair

Aerospace Safety Advisory Panel

cc:

Chief Safety and Mission Assurance Officer/Mr. O'Connor

Space Operations Mission Directorate/Mr. Readdy

Kennedy Space Center/Mr. Kennedy

Kennedy Space Center/Mr. Crawford