National Aeronautics and Space Administration

AEROSPACE SAFETY ADVISORY PANEL
PUBLIC MEETING

October 20, 2005

NASA Headquarters

Washington, DC

MEETING MINUTES

John D. Marinaro
Executive Director

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

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Panel Attendees
Vice Admiral Joseph W. Dyer, USN (Ret), Chairman
Dr. Augustine O. Esogbue
Major General Francis "Rusty" C. Gideon, Jr., USAF (Ret)
Mr. John C. Marshall
Mr. Rick E. Williams
Brigadier General Joseph A. Smith, U.S. Army, Ex-Officio member
Mr. John D. Marinaro, Executive Director

Panel Members Not In Attendance
Dr. Dan L. Crippen
Dr. Amy K. Donahue
Ms. Deborah L. Grubbe
Mr. Steven B. Wallace

Observers
Mr. Ken Monroe, House Science Committee
Ms. Traci Watson, USA Today
Mr. Chris Blackerby, NASA HQ's/OER
Ms. Kathy Dakon, NASA HQ's/OER
Mr. Edward Ingraham, NASA HQ's/OCE
Ms. Kathy Lueders, NASA HQ's/OLA
Ms. Melissa Matthews, NASA HQ's/PAO
Mr. Michael Ralsky, NASA HQ's/A
Ms. Diane Rausch, NASA HQ's/OER
Mr. Joe Bruhl, aide-de camp to General Smith
Ms. Susan Burch, ASAP Staff
Ms. Tiffany Ledbetter, ASAP Staff

Telecon Observers
Mr. Todd Halvorson, Florida Today

The first 30 minutes of the meeting were reserved for public comment on safety in NASA. No members of the public requested time to make a public comment and no members of the public submitted any written comments.

INTRODUCTION

Mr. John Marinaro, Executive Director of the Aerospace Safety Advisory Panel (ASAP) called to order the fourth quarterly meeting of the 2005 ASAP. The Chairman of the ASAP, Admiral Joe Dyer, made some administrative remarks, noting that the ASAP members Dr. Crippen, Dr. Donahue, Ms. Grubbe, and Mr. Wallace were not present; however, the majority of the panel was present for this meeting.

OPENING COMMENTS

Admiral Dyer introduced some topics of interest concerning the broader focus of the ASAP, and expressed appreciation of NASA's line management and the Agency's responsibility to lead. The ASAP therefore is generally non-prescriptive in its recommendations. The panel has made periodic visits to pertinent topics and attempts to do service to both the NASA Administrator and to the nation. The Columbia Accident Investigation Board (CAIB) report provided a touchstone for the overarching areas of the ASAP's interest, namely: the cause of the Columbia accident was rooted in the history and culture of NASA. Resource constraints, schedule pressures, mischaracterization of shuttle, reliance on past success as a substitute for sound engineering practices, organizational barriers to communication, stifling of professional differences of opinion, and an informal chain of command were some causes, among others, that contributed to the accident. The ASAP attends primarily to the organizational causes, and continues to have the highest regard for NASA's ability to work to ground a question of engineering or science without the need for contributions from groups like the ASAP. The ASAP has been generally complimentary about NASA's progress over the last two years, while the panel has been carefully monitoring the culture, as well as how and who is empowered to make technical decisions. The Independent Technical Authority (ITA) construct is being revisited; these new approaches may lead to better methods and simpler implementation of the technical authority. New directions need to be broadly communicated and implemented with completeness and speed. To address the challenges presented by the ASAP's quarterly meeting schedule, the panel has formed four subcommittees or working groups to address: workforce issues, culture and leadership, technical authority, and risk assessment and management. In addition, the ASAP has been studying the impact of NASA's post-CAIB transition on safety, measurement of progress, communications within the organization, and standardization and sharing of best practices.

MEETING FOCUS

- Workforce and human capital management
- Legislation
- iTA
- Space Shuttle
- Culture and leadership
- Hurricane impact on facilities

WORKFORCE AND HUMAN CAPITAL MANAGEMENT

Mr. Rick Williams reported observations on strategic workforce planning, and called this element out as a critical element for NASA, going forward. The short-term agenda has seen NASA moving to address uncovered capacity, center workloads, and the sunsetting of the Shuttle program. The subcommittee has found that NASA has been working to rebalance project tasks, helping to offset uncovered capacity and providing learning experiences to staff. A hiring freeze is in place and packages have been offered to employees. The Systems Engineering and Institutional Transitions Team (SEITT) has taken a holistic approach to the long-term direction of NASA, and is made up of five subgroups- workforce, contractors, integration, organization, and infrastructure. SEITT is specifically chartered to understand and identify challenges and opportunities, and define a framework for workforce planning and transitions, as well as the Agency competencies required to carry out the President's Exploration vision. There is a deliverable in December with respect to the workforce plan. It is very important to see this first step delivered, as the deliverable provides a structure for details to be fleshed out upon. NASA needs to identify competencies and close any gaps. Mr. Williams recommended that the competency work should be externally validated. While NASA recognizes the urgency of the issues, the ASAP should reiterate the need for external validation, the identification of competency gaps going forward, and fleshing out the December deliverable into a full strategic plan. Admiral Dyer commented that the commercial aerospace industry is seeing issues similar to those that NASA is currently facing. Mr. Williams added that in general, US industry is dealing with an aging workforce and limited resources. General Gideon asked who might appropriate for external validation. Mr. Williams said any number of them can do this— National Academy of Public Administration being one.

LEGISLATION

General Rusty Gideon reported on the NASA Authorization Act of 2005 concerning safety management. Both houses of Congress have passed bills to update the 1968 bill describing the charter and scope of the ASAP. New responsibilities assigned to the ASAP is the provision of an annual report to both the NASA Administrator and Congress. The report would address items that include NASA's compliance with CAIB recommendations. The first version of the report is also to include an evaluation of NASA's safety management culture. General Gideon received the impression that Congress is very supportive of NASA in general. Mr. Marshall expanded on this observation and asked: because this is a significant change, how does the ASAP fulfill this requirement? The ASAP has started to brainstorm ideas to meet this responsibility. There has been a preliminary discussion on having a safety assessment performed on the International Space Station and there is talk of possibly using this Panel and the ASAP is prepared to proceed in any direction desired by Congress or the Administrator.

Independent Technical Authority (iTA)

Admiral Joe Dyer reported on the establishment of NASA's ITA, which has long been an ASAP focus. The current NASA strategy is the creation of independent engineering and programmatic decision chains. The other strong thrust is one of increasing the status and

influence of engineering in the decision process, to bring it on par with programmatic concerns. NASA has clearly embraced CAIB's recommendation that the technical authority reside with an individual, not an organization- this ensures appropriate attention paid to technical matters. The new construct for ITA is still taking shape, including the warranting of subject matter experts. Warrant holders have been designated and are in place. Admiral Dyer invoked the "first rule of wing walking- be careful not to let go till you have something to hold on to". There are new roles for engineers in the centers and in the engineering chain of command. A new Chief Engineer will be in place next week. The ASAP believes the new infrastructure has great promise, but a complete technical authority is still not aboard NASA. When things go wrong, a time must come for a decision to proceed; this decision must reside in the technical authority office. The NASA ITA process is not yet simple, fully understood, or fully communicated to the workforce. In an attempt to help, the ASAP has reiterated questions it offered in its 2004 quarterly report, including devil-in-the detail questions. Who are the subject matter experts and in what subjects, where do they reside, who signs their performance evaluations, who can override the warrant holders, are they independent of geography, is ongoing education available, how are disagreements resolved?

SPACE SHUTTLE

Dr. Augustine Esogbue reported on the overall transition of items from the Stafford-Covey Return-to-Flight Task Group. Overall, the subcommittee noted no red flags in 17 identified items. There were two or three yellow items, mostly green. Eight items can be considered closed, 9 are still open. One of the three main areas of concern included the debris shedding events observed on the External Tank (ET). Less debris than expected was shed, and debris shedding was most significant at the Bipod and PAL Ramp areas. No critical damage to the orbiter was observed. Video significantly enhanced the ability to detect debris. The ET camera successfully recorded the launch beginning 5 seconds after solid rocket booster separation. The boom camera was also used on this flight to inspect the orbiter. The use of the boom camera was highly successful, and yielded good data with very high resolution. Although the long-term strategy is to avoid using boom cameras in future flights, NASA has agreed to its use for the short term. Overall, hits were fairly consistent with historical data with regard to total mass of debris foam lost. Sixteen foam particles were larger than the maximum allowed by the program requirements; efforts are ongoing to improve this parameter. Investigation is ongoing into causes of each foam loss. Testing will proceed through December to identify the root cause of debris shedding. Future flags for upcoming flights include the attempt to minimize unintended damage by technicians working on or near delicate areas of the orbiter. The issue of orbiter hardening also remains open. Hardening techniques have already been incorporated for STS-114, including such measures as improved reinforced carbon-carbon (RCC panels), landing gear door protection, and window strengthening. Dr. Esogbue felt that it might not be necessary to continue orbiter-hardening activities. It was also observed that NASA had been very lucky regarding an unanticipated incident (buzzard strike) during STS-114. It was fortunate that the buzzard hit the top of the ET; if the impact had occurred on the wing or other delicate areas, the event would have been

far more destructive. NASA is aware of this potential hazard and is seeking better ways to control the immediate environment of the orbiter during launch.

Admiral Dyer reminded the panel that the CAIB and Stafford-Covey panels have stood down. The ASAP now represents the independent overview and insight into safety of flight aspects at both the discrete and general levels. Therefore the ASAP will be strongly involved in the oversight of the second return flight.

SAFETY CULTURE AND LEADERSHIP

Mr. John Marshall set the stage for the discussion by noting that a strong safety culture is inherently important in any high-risk enterprise if the enterprise is to be successful. Accordingly, the current ASAP routinely has concentrated on safety culture and leadership issues since the beginning of its term. Mr. Marshall specifically noted that Dr. Griffin previously had requested that the ASAP "keep its finger on the pulse of the safety culture within NASA," further emphasizing the significance of the ASAP's focus. This said, Mr. Marshall then referred back to the CAIB's August 2003 report where systemic safety culture and organizational issues were identified as contributing to the loss of the Columbia. The CAIB specifically noted failures of decision making, risk management, and communication. Mr. Marshall then noted that NASA had responded aggressively to these areas by embracing a comprehensive approach, including selecting an outside contractor, to lead the "transformation of its organization and safety culture." First, a cultural assessment was completed in early 2004 which identified the agency's strengths to be technical excellence, teamwork, and a can-do attitude. Weaknesses, however, were seen in a lack of upward and open communication within the organization, failure to communicate deficiencies, and an unwillingness to accept bad news. With a baseline in place, NASA then set in motion a two- phased process to address these deficiencies. The pilot phase began in April 2004 with Glenn, Stennis, and Johnson Centers personnel undergoing broad-based group activities to begin changing the culture. Initial results were reported to be promising. Kennedy and Goddard also began limited training. Phase 2, which would continue to develop and further integrated this effort throughout the entire agency (except JPL) began in January 2005. Areas of focus included leadership coaching, multiple-rater feedback, skills training, cognizant-bias recognition, and behavioral observation and feedback. In April 2005, a senior-level decision was made not to proceed further with the current approach despite eighty-four percent of participants being surveyed found the training useful.

Mr. Marshall then noted that today NASA has shifted its approach back to individual centers being responsible for routinely monitoring and reporting on the status of their safety culture within their organizations. Further, NASA has encouraged voluntary executive coaching and training, codifying language and philosophy in their newly published Strategic Management and Governance Handbook dealing with the importance of a positive safety culture, and encouraged the use of a Performance Evaluation Profile (PEP)-style performance evaluation. Despite these positive actions, Mr. Marshall reported that the ASAP is troubled by the shift away from NASA's emphasis to positively modify safety culture to one that only monitors the status of culture and is less

confident that the issues identified by CAIB are being addressed. Mr. Marshall further noted that the ASAP felt that NASA's new approach lacks the metrics necessary to positively change culture, lacks standardization within the agency thereby preventing agency-wide comparisons, and does not systematically provide visibility of cultural changes (positive or negative) to NASA's senior management. General Gideon noted that Ms. Grubbe had offered NASA a baseline change agent and mentioned that both the Navy and the Air Force have teams that can go out and take snapshot culture assessments. Mr. Williams added that the effort must be owned by NASA leadership, but third-party support could be valuable. Gen. Gideon remarked that a continual survey-taking may not the best approach either.

HURRICANE DAMAGE AT THE STENNIS SPACE CENTER (SSC) AND THE MICHOUD ASSEMBLY FACILITY (MAF)

General Joe Smith recounted a briefing from Bill Parsons regarding the damage to SSC and MAF incurred during Hurricane Katrina. The bottom line is that testing of engines is ongoing. At MAF, ET 119 and 120 are on track to be delivered. The only challenge is hydrogen production (70 percent of what is required, at present). The Emergency Operations Center convened at SSC on August 30th performed in an outstanding manner. SSC distributed supplies to six counties, and warehoused other commodities such as water, meals-ready-eat, and ice. The center provided support to 2700 responders, 2000 military personnel, and 500 truckers. NASA has much to be proud of in its response to the hurricane. Mr. Williams seconded General Smith's remark. Mr. Marshall observed that there were many heroes at SSC and MAF.

ROUNDTABLE

Three topics, which are integrative themes to the ASAP, are measurement, communication, and standardization. The panel does not advocate particular approaches or companies. How then, does the ASAP assess whether NASA is promulgating its safety culture? Safety culture measures must be integrated, baselined, and shared.

MEASUREMENT

General Smith remarked that there are still many challenges in the culture business; now that the Behavioral Science Technology Inc. (BST) effort has been dismantled, he expressed concern about how NASA will continue to measure its success. Mr. Marshall noted that decisions that are made on gut feel often lead down the wrong road. Hard-core, metrics-driven analysis is the only way to make concrete, lasting decisions. It is an integral process to any technical organization. Dr. Esogbue observed that NASA, as a socio-technical organization, should not resist measurement and that the crucial question is: what is being measured and how accurately? Precision is not truth; data, though precise, must measure reality for it to provide utility. Mr. Marshall stated that there are sensors onboard on every airline flight to establish norms by way of constant, repetitious evaluations. General Gideon remarked that precursor definitions are better than post-hoc accident analysis. General Smith felt that moving from survey to leadership-

centric measures is a positive step. Admiral Dyer noted that NASA needed both survey and leadership measures.

COMMUNICATIONS

Mr. Williams made some observations regarding ITA and technical corrections. Changes create an additional burden on the organization to communicate the whats and whys of the changes. General Smith agreed that communication is a key component of the changes. The ASAP is looking for NASA to provide communication in multiple forms; it is an important component of cultural change. Admiral Dyer offered a "BFO", a blinding flash of the obvious- it takes energy and time for changing information to percolate down to those who do the work.

STANDARDIZATION

Mr. Marshall stated that the ASAP is not trying to deny center individuality. NASA has some standardization, but the Agency is missing an opportunity to leverage wonderful programs that are ongoing at centers--there continues to be a need to do this. General Gideon felt that the standardization requests seem to come from the aviators. He agreed that while there is uniqueness in NASA, there is a greater need for standardization. Mr. Williams expressed sensitivity to the different abilities of the centers, but noted that when these unique abilities are not shared, an opportunity is lost. Dr. Esogbue added that while centers can be creative and different, minimum standards must be maintained. Admiral Dyer remarked that there are things at individual centers that absolutely sparkle, and that he was excited about taking good ideas from one center and sharing it with others. NASA appears to have some aspects of the Articles of Confederation in its center-splintered culture. Dr. Esogbue stated that NASA has embraced the "Lessons Learned" concept; thus, standardization of the better lessons learned from the "sparkling" centers, should be an extension of the concept.

MEETING ADJOURNED

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

Traci Watson of USA Today posed a question regarding metrics on tracking the technical authority. General Smith responded that NASA is shifting away from numbering warrant holders and must put something in place to measure the rate of success. Admiral Dyer added that the new Chief Engineer has the task of getting on with this.