

NASA AEROSPACE SAFETY ADVISORY PANEL  
National Aeronautics and Space Administration  
Washington, DC 20546  
VADM Joseph W. Dyer USN (Ret.), Chair

February 6, 2012

Mr. Charles F. Bolden, Jr.  
Administrator  
National Aeronautics and Space Administration  
Washington, DC 20546

Dear Mr. Bolden:

The Aerospace Safety Advisory Panel (ASAP) held its First 2012 Quarterly Meeting at NASA Headquarters on January 26-27, 2012. We greatly appreciate the participation and support received from the subject matter experts and support staff.

The Panel submits the enclosed Recommendations with Minutes resulting from this meeting for your consideration. As part of its response to our recommendations, we request that NASA provide an Agency Point of Contact (POC) and the expected completion or implementation date for the action(s).

Sincerely,

A handwritten signature in black ink, appearing to read "J W Dyer". The signature is fluid and cursive, with a large initial "J" and "W" and a distinct "Dyer" at the end.

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

Enclosure

**ASAP RECOMMENDATIONS, FIRST QUARTER 2012****2012-01-01 Standardizing and Funding NASA Wellness Facilities** [ASAP point of contact: Mr. John Frost]

Finding: All NASA Centers are reported to have wellness facilities available, but they vary from Center to Center in degree of access, staffing, outfitting, and funding support.

Recommendation: NASA should develop a standardized wellness program approach that ensures that all employees have an equal opportunity for access to NASA's wellness facilities. NASA should examine ways to standardize and control the level of support for the facilities to a higher degree. The ASAP encourages NASA to explore the funding streams and consider whether they should be centralized.

Rationale: Accident statistics show that more injuries to NASA personnel involve ergonomics issues than any other cause. A strong wellness program with appropriately supported facilities can contribute to reduction in the rate of these types of injuries as well as overall wellness. Establishing standards for the required level of support for wellness programs among Centers will result in a reduction in ergonomics related injuries.

**2012-01-02 ISS Deorbit Capability** [ASAP point of contact: Dr. James Bagian]

Finding: The ISS Program Office is in the early stages of developing a plan and capability to safely deorbit the Station at the end of its operational life in 2020 or beyond. Because that milestone will be at least eight years away, there is significant time available to prepare for it. However, there is a real possibility that any of a number of potential malfunctions could occur at any time that could force the evacuation and deorbit of the Station with little notice. Uncontrolled Station reentry at a random location may pose a significant risk to the public on the ground. Therefore, development and implementation of a controlled reentry capability should be pursued as quickly as possible.

Recommendation: (1) To assess the urgency of this issue, NASA should develop an estimate of the risk to ground personnel in the event of uncontrolled ISS reentry. (2) NASA should then develop a timeline for development of a controlled reentry capability that can safely deorbit the ISS in the event of foreseeable anomalies.

Rationale: An unexpected, emergency event could precipitate the need to deorbit the ISS at any time. Timely development of the plan on how to respond to such a situation before it occurs will allow an optimum response and maximize the safety to the public in such a situation.

**2012-01-03 Extension of Soyuz Lifetime** [ASAP point of contact: Mr. John Frost]

Finding: Crew return capability from the ISS currently is totally dependent on docked Soyuz spacecraft. Because of physical life limits on a limited number of specific systems on the Soyuz, they have a strict life limit of six months. That means crews must complete their tour and return home on a rigorous schedule. Unfortunately, in the event of a significant delay in the arrival of replacement crew, this strict life limit could conceivably cause the de-crewing of the Station. Extension of the life limits on the Soyuz could greatly reduce the probability of such a situation. The Russians have determined that such an extension is feasible, but are not currently pursuing it.

Recommendation: NASA should actively pursue with the Russians the plan to extend the Soyuz on-orbit lifetime from six months to twelve months.

Rationale: An extended Soyuz lifetime could double the crew's potential dwell time and greatly reduce problems if there is a Soyuz launch delay.

**2012-01-04 Commercial Crew Safety Certification Process** [ASAP point of contact: Dr. Donald McErlean]

Finding: Certification requirements and standards have been addressed at a high level, but not down to levels 3 and 4. The next phase of the Commercial Crew Program—Phase 1, Integrated Design—will not be as constrained under Space Act Agreements as under Federal Acquisition Regulation (FAR)-based contracts. Therefore, it is even more important to understand what the certification requirements are going to be and how such certification will be accomplished so that the various partners have the maximum opportunity to be properly prepared to address and satisfy them.

Recommendation: NASA should define the safety certification process and standards, down to levels 3 and 4, as quickly as possible. NASA should provide the ASAP forthwith the schedule by which these requirements will be developed and promulgated.

Rationale: Without these requirements well-defined and understood, the uncertainty goes up and the risk goes up. NASA could potentially arrive at a place where the various commercial ventures either don't satisfy the requirements, or NASA is under pressure to accept more risk than intended.

**2012-01-05 Maintaining NASA Pilot Proficiency** [ASAP point of contact: Dr. George Nield]

Findings: Flying complex aircraft and maneuvers for NASA missions requires that a minimum level of flight proficiency must be obtained in the aircraft, with some augmentation from flight simulators. With the exception of astronaut flying, NASA pilots historically have relied on achieving the required proficiency through operational missions paid for by funded projects. This can be a challenge when an aircraft is down for extended major maintenance or modification for a research campaign, long intervals between projects, or general loss of project funding. In fact, decreased project funding over the past seven years has resulted in an accompanying decrease of approximately 32 percent of flight time and 37 percent sorties available for NASA flight crews to fly. This is further exacerbated in that program managers are reluctant to fund dedicated flight training, instead insisting that project funding be used exclusively for project completion.

In the past, this challenge has been mitigated in two ways. Chiefs of flight operations at Centers actively collaborate to obtain flight time for their pilots at other centers, and HQ/OSI/AMD manages a small budget for flight simulator contracts. As NASA's budgets decline, both solutions no longer can mitigate the loss of operational flying.

Recommendation: NASA should investigate the risk of reliance on its historical approach for maintaining pilot proficiency considering anticipated further budget reductions, including an assessment of the need to develop a centrally-funded flight training budget so as to ensure all NASA pilots maintain flight proficiency.

Rationale: Declining project budgets can result in reduced flight opportunities to a level where flight crews are unable to maintain a minimum safe level of proficiency, yet no Headquarters process exists to provide funding for pilot-proficiency training flights.

**AEROSPACE SAFETY ADVISORY PANEL  
Public Meeting  
January 27, 2012  
NASA Headquarters  
Washington, DC**

**2012 First Quarterly Meeting  
Report**

**Aerospace Safety Advisory Panel (ASAP) Attendees**

VADM (Ret.) Joseph Dyer (Chair)  
Dr. James Bagian  
Mr. John Frost  
Mr. John Marshall  
Dr. Donald McErlean  
Ms. Joyce McDevitt  
Dr. George Nield

**ASAP Staff and Support Personnel Attendees**

Ms. Harmony Myers, ASAP Executive Director  
Ms. Susan Burch, ASAP Administrative Officer  
Ms. Paula Burnett Frankel, Reports Editor

**NASA Attendees**

Ms. Kelly Kabiri, NASA Office of Safety and Mission Assurance  
Ms. Diane Rausch, NASA Office of International and Interagency Relations

**Public Attendees**

Ms. Zaira Garate, Space Foundation  
Mr. Ken Monroe, House Science, Space, and Technology Committee  
Mr. Randy Correll, Ball Aerospace  
Mr. Phil Smith, The Tauri Group  
Mr. Bob Richards, Orbital Science  
Mr. Len Sirota, Sirota Management  
Mr. Sebastian O'Kelly, Robertson & Monagle

**OPENING REMARKS**

VADM (Ret.) Joseph Dyer called the ASAP's First Quarterly Public Meeting of 2012 to order at 11:00 am. After Panel, NASA, and public attendee introductions, he reviewed the agenda, which included the following topics: the International Space Station (ISS); the Space Launch System (SLS); and the Commercial Crew Program (CCP).

VADM Dyer shared the Panel's findings from the briefings and discussions over the past two days. He began with the CCP topic because it was the "highest tempo" discussion of the meeting. In the ASAP's annual reports (the 2011 Annual Report was just published, and all reports are available on the ASAP website: <http://oiir.hq.nasa.gov/asap/index.html>), the Panel has continued to appeal for clarity and constancy of purpose. It recognizes the necessity for a shared vision that must go beyond NASA. This vision must include the White House, the Hill, NASA, and even the American people. If all of these stakeholders can embrace a shared vision, then all things are possible. VADM Dyer posed the question: What is the purpose of the Commercial Space Program? Is it to transport humans to the ISS? Is it to nurture a commercial space industry? Or is it something in between? As the ASAP perceives it, the purpose has evolved. It has been tightly focused on transport to ISS. The ASAP believes there is now a "sea change" in the objective—to be one of supporting industry's capability to deliver national economic benefit. This new direction may also support crew transport to the ISS providing it is able to meet NASA's requirements and to be certified to carry NASA crew.

For at least four or five years, the ASAP has been a champion of the necessity to promulgate the requirements and has expressed concern while watching design mature concurrent with the development of requirements. We are in a new stage where there is an opportunity to quickly develop success criteria, or the criteria that will let NASA say that the design and the system is sufficient to carry humans into space. VADM Dyer described a “box” that NASA would be wise to avoid: imposing so much oversight, administration, or constraint such that the schedule is extended and costs increase. It is a time when industry should have an opportunity to deliver the service more efficiently. NASA has been nudged into the direction of insight rather than oversight. On the other end of the continuum, when a system is presented for certification to carry humans without the kind of detailed insight that NASA has historically had, it would be a good thing if there had been sufficient communication between NASA and industry—as well as sufficiently understood criteria for acceptance—so that there would be a “good news” story. A “bad news” story would be: it’s not certified, it cannot be certified, and industry claims that NASA should have told them about that before they spent millions of dollars. Staying out of these two corners and finding a successful and efficient place in the middle continues to be one of the challenges and is the basis for much of the ASAP’s appeal for clarity.

The ASAP believes that the White House, the Hill, and NASA have to work closely together. This was evidenced when some on the Hill criticized that the report implied that it was their fault for not providing sufficient budget. NASA would certainly say that today’s budget does not support what is needed. However, the Hill would say that the cost estimate was an order of magnitude wide (from \$1 billion to \$10 billion), and the clarity of an integrated program was not sufficient. The ASAP recognizes the leanness of the budget and the requirements for communication; this is the basis for the Panel to say that everyone must work together to find a way out of the dilemma—no one entity can do it by itself.

With that preamble, VADM Dyer proceeded with the other agenda topics.

#### **SUMMARY OF ASAP RECOMMENDATIONS**

Dr. George Nield noted that as part of the ASAP regular meetings, the Panel looks at all of the open recommendations and NASA’s responses and continues to update and maintain the open items. He noted that the Panel has seen increased responsiveness on NASA’s part, and there is a good system in place to keep up with the Panel’s concerns and NASA’s responses to them. This is an ongoing activity that is addressed at each quarterly meeting.

*[Post-meeting follow-up: In regards to ASAP recommendation 2010-01-07 Methodology for Performing and Integrated Abort Risk Analyses and Development of Supporting Tools, NASA provided ASAP a copy of the newly released NASA/SP-2011-3421 Probabilistic Risk Assessment Procedures Guide for NASA Managers and Practitioners. This guide includes a very good discussion of the factors to be considered in performing abort system analyses. It provides examples of abort hazards and methodologies used in the past for their assessment. To complete this action, the Panel would like to see how this abort analysis methodology is implemented in top level Agency human rating requirements for both traditional and Space Act Agreement acquisitions. The recommendation can be closed when this linkage is confirmed.]*

#### **UPDATE ON ASAP RECOMMENDATION ON IRIS SUPPORT AND SAFETY METRICS**

Mr. John Marshall briefly summarized the findings from the discussion on safety metrics. The Panel traditionally examines a broad range of issues that impact the Agency, including employee health and well-being. An important element of that is on-the-job injury. Over the years the ASAP has recommended definitions, reporting processes, analyses, corrective actions, as well as highlighting to the employees the threats that they face in the day-to-day workplace.

This week, the ASAP received two excellent briefings from Mr. Alan Phillips, Director of the NASA Safety Center (NSC). One was on reporting issues, primarily the program that NASA uses for reporting and analysis. The ASAP interest has evolved to helping the NSC develop a more comprehensive system that is faster, less labor-intensive, and can serve as a more useful tool to the Centers and NASA senior management. Mr. Phillips provided an update on the system. They are making great progress, are on the right track, and moving in the right direction.

The next briefing gave the Panel a summary update on safety metrics for 2011. The NSC has done a great job to codify some of the performances, and the numbers are excellent. For instance, in 2011 (compared to 2010), there were 26 percent fewer injuries and illnesses and 28 percent fewer damages and mission failures. This is a significant number considering that they are already below the federal government average. In terms of total cases of injuries, the federal government is at a level of 3.0 per 100 employees; NASA is at 0.5. In terms of lost time frequencies, the federal government is at 1.4 per 100 employees; NASA is at 0.2.

Ergonomic injury (or ergonomics) is the injury category with the highest cause of injuries. Vehicle accidents produce the highest danger in the damages category. NASA is active and aggressive in addressing both of those. They recently had an Agency-wide focus day that included video on workplace threats and actions that can be taken. The bottom line is that the ASAP appreciates and applauds NASA's progress. This said, Mr. Marshall noted that while there always is room for improvement, NASA's 2011 performance and statistics are very impressive and appropriately demonstrates to NASA's employees that this Agency cares about their wellbeing.

#### ***UPDATE ON ASAP RECOMMENDATION ON WORKFORCE WELLNESS***

Mr. John Frost noted that although attention is normally focused on human spaceflight, there are thousands of government workers and contractors at NASA every day that are exposed to risk as they do their jobs. In the statistics that were mentioned by Mr. Marshall, NASA has parsed out the causes of accidents. The majority of injuries relate to ergonomics. These injuries take workers away from the job, create pain, and increase costs. Recently, the ASAP recommended that NASA study the ability to utilize time away from work to participate in wellness training. Mr. Frost was happy to report on a good briefing by Dr. Vincent Michaud from the Office of the Chief Health and Medical Officer. The ASAP is pleased that NASA quickly found a way around the legal hurdles and is implementing an enhanced wellness program that will encourage regular physical activity. He suggested that this recommendation be closed when the policy is signed. The ASAP also had a good discussion about the wellness facilities at the Centers. All Centers have something available, but they vary from Center to Center. The Panel would like to see more consistency—in particular, ensuring that all employees have equal access to the facilities. Mr. Frost proposed a recommendation that NASA explore ways of standardizing that support and centrally controlling it to a higher degree. He encouraged looking at funding streams and whether they should be centralized, as well as an overall approach to ensure that every employee has a good wellness program available to him or her.

#### ***COMMERCIAL SPACE***

VADM Dyer noted that the Commercial Space agenda topic was summarized in his opening remarks. The Panel had good discussions with the Administrator, the Deputy Administrator, and Mr. Chris Scolese.

#### ***INTERNATIONAL SPACE STATION***

Dr. Donald McErlean noted that the ASAP received an extensive briefing from Mr. Michael Suffredini, ISS Program Manager, covering a wide variety of topics. Because of some changes in the near term launch schedule, Dragon and Orbital launches have moved to the right. It appears that after 46P (the Progress vehicle scheduled to dock on January 27, 2012), the next vehicle to arrive at the ISS will be the Automated Transfer Vehicle (ATV). That schedule works out well for the crew as those currently on board the ISS have been trained to handle the ATV. Next, a series of topics were discussed by Mr. Suffredini. Regarding micro-meteorite orbital debris (MMOD) damage protection, the Russians have moved forward on a modification to Soyuz—an improvement that was recommended to them by the ISS partnership—to increase the shielding on the Russian Service Module and on the Soyuz and Progress vehicles so that they have significantly greater protection and thus offer more protection to the ISS as a whole. In addition, they have laid out a plan to achieve even greater protection, thus ultimately bringing their sections/vehicles to the same level of protection as the ISS recommended goal. This design improvement will bring the entire Station shielding up to a considerably better level. The first segment of that improvement will occur in increments 29 and 30, which will be within the next couple of months. With regard to the work scheduling of the U.S. crew, the U.S. team had set out a goal of 35 hours per week (for the U.S. sector) for experimental and scientific tasks as opposed to Station upkeep tasks. They are clearly moving in that direction. They had a slight setback with the delay in the Soyuz launch due to the accident investigation at the end of last year. However, by the end of this first quarter, they should have achieved the utilization goal. This represents a considerable increase in the amount of time that they are able to devote to the Station's scientific aspects.

In regards to long term upgrades and improvements for extended life, they have successfully moved through the Enhanced Processing and Integrated Communications (EPIC) project, which is a substantial increase in high-rate communications. For example, the median bandwidth capability has moved from 7 Mbps to over 100 Mbps. This is important because much of the work being done now involves high definition video, and this improvement will provide a greater capability to downlink video. From a safety perspective, they have realized that while they have always had procedures and processes for potential failures, they did not have anything codified that would allow them to take extremely rapid reaction should a serious failure occur. They have now outlined the top potential failures and are developing and practicing failure procedures. This is moving along nicely; they are prioritizing the actions and training the existing and upcoming crews in the emergency process. The ASAP complimented the program and found this to be an excellent approach. As the topic has been in the news most recently, Mr. Suffredini commented on Soyuz and Progress performance. He reported that all of the data to this point seem to indicate that

we do not have a problem with Soyuz for ISS. The Russian attention to quality assurance on the human side appears to be very good, and Mr. Suffredini's view is that the prior Soyuz problem is behind us.

One of the perhaps less obvious scientific research aspects of the Station is to expose the human crew to extended periods in the space environment. Carefully monitoring reported changes in the crew health and performance is important to the formulation of requirements for long duration space flight. In this regard, the program has found that one human impact of longer duration flight appears to be some potential for symptoms that may be associated with raised intracranial pressure and manifested as changes in visual acuity apparently due to elevated intraocular pressure. The medical team is evaluating this and, at present, do not know if this has a long-term, lingering effect. The immediate steps being taken are to move toward a lower sodium diet and to carefully control the partial pressure of CO<sub>2</sub> in the atmosphere. They are also providing adaptive corrective lenses during the mission. The program is taking appropriate short and long term steps to address the problem. If we are going to extend the human reach into the solar system, we must have humans in space for long periods of time; therefore these findings relative to long duration space flight are important from both an operational and scientific perspective.

In the 2011 Annual Report, the ASAP addressed early termination planning and end-of-life planning. When this report was written, the ASAP had not seen a codified plan on end-of-life situations or what might happen in an emergency failure situation. Mr. Suffredini pointed out that they have initiated work on what would be a detailed early termination plan; this is good, but they need to continue because it is not yet complete. At the moment, all the failure modes assume that the Station is still under control and that the number one action they would take would be to raise the Station's altitude, which would give them time to work any subsequent problems. They feel that the best solution for targeting end-of-life deorbit is to employ a somewhat modified Progress vehicle that would allow that vehicle to utilize fuel that is onboard the Service Module. They think that this approach will be favorably viewed by the Russians, but they have not yet secured approval by the Russian partners for this plan. Mr. Suffredini noted that the ATV will also work, but it is right at the margin in terms of containing the necessary amount of propellant. In all cases, of course, the Station will come down at the end of life and re-enter the atmosphere, and they are now working analyses to determine (if the Station is under control) what the most desirable trajectory will be in order to minimize risk to those on the ground. The ASAP applauds the effort and is pleased that the program is moving forward on this issue.

Dr. Nield noted that in the future, the scenarios on landing are dependent on the number of burns, the length of the burns, and the thrust level of the burns. This depends on the particular vehicle that is chosen for control. By using ATV, NASA's preliminary analysis indicated that they may not meet the target of 1/10000 chance of impacting a person. NASA agreed to share with the ASAP what the analyses show for the different vehicle scenarios and compare those with a random, uncontrolled reentry case. Dr. McErlean added that the program will be working with the Russian partner to make the modifications to the Progress vehicle that would enable its use. Mr. Marshall observed that in 2014, the ATV goes away, so there must be an alternative to it or an extension of the ATV program will be required. Mr. Frost added that because an unexpected, emergency event could precipitate end-of-life tomorrow or next week, time is important. To help the ASAP track this, he recommended that NASA provide a timeline for development of this capability, both the plan and the hardware. Time is more important depending on how much risk there is under the present situation. He noted that NASA offered to make a calculation of the rough range of risk. We should identify what the risk is today to help make this a priority effort.

Dr. McErlean reported that the final issue that was discussed under this topic was life extension. The program is performing an analysis of all systems based on both 2020 and 2028 target end-of-life dates. From a technical perspective, it does not appear that there is any significant life extension issue. There are certain Station issues because the systems have to be recertified for use beyond their current estimated end-of-life. However, Mr. Suffredini reported that most of the systems were designed for 30 years of operational life; while the ISS was not completed until recently, some of the systems are already 10 years into their lifetime but both the target years are within the 30-year window. The program is making good progress and at this point, has not encountered anything that cannot be done. They are moving ahead with putting together the work plan to recertify the Station system for one of the two life extension dates.

Mr. Frost noted that the recent issues with Soyuz and the delay in getting crew back to Station pointed out the vulnerability in being single-string dependent. This is not something that we can do anything about for awhile. However, the recent Soyuz delay pointed out a unique opportunity. The Soyuz needed to get there before the certified life of the last Soyuz return vehicle ran out, and they were very close to that. This is something that we can do something about. The ASAP is pleased that progress has been made, and that the Russians have looked at this. He recommended that NASA pursue with the Russians the plan of how Soyuz lifetime could be extended—specifically, what it would take to extend the lifetime from 6 months to 12 months—and thereby double the crew's potential dwell time and greatly reduce problems if there is a Soyuz launch delay.

**SPACE LAUNCH SYSTEM AND MULTI PURPOSE CREW VEHICLE (MPCV)**

Mr. Frost stated that the ASAP had not heard a lot about these programs, but they are rapidly evolving. The Panel received a good explanation of the three basic elements of the exploration system: the SLS, the MPCV, and the Ground Systems Development and Operations (GSDO). The bottom line is that they are at the point of establishing level one requirements. At present, there are notional requirements, and one of those that is important to the ASAP is the maximum Loss Of Crew (LOC) probability. That requirement has not been firmly established, but there were some draft notional concepts that concerned the Panel, and NASA has agreed to flesh those out. The ASAP would like to understand the LOC requirements for this vehicle versus the Agency requirements vis-à-vis the commercial requirements to ensure that the integrated package makes sense. NASA has agreed to do that and the ASAP will follow up. Mr. Frost did not have a recommendation at this time.

VADM Dyer added that the ASAP will be focusing more on the SLS and the MPCV in the year ahead, and the exploration system will be an agenda item at future meetings.

Dr. Nield commented that as we look at the current plans for test flight and first crewed flight, there are discussions underway regarding how many flights are necessary before a crew flies on a vehicle. Is there a minimum flight rate to maintain currency of the entire team? These are issues that the ASAP has dealt with on the Shuttle side, but now that there is a new system, everyone should be comfortable with the plans for this as well.

**OSMA CHANGING WORK SKILLS AND SMA ROLE DESCRIPTION**

Mr. Marshall stated that with the transition from historical Federal Acquisition Regulation (FAR)-based contracts to Space Act Agreements (SAAs), the ASAP challenged the Safety and Mission Assurance (SMA) community to examine what it will take to help SMA individuals learn to effectively work projects that use SAAs. NASA responded that they have been working on this for some period of time. Now, the ASAP's focus has been how the Agency as a whole has been adapting to this change to ensure that they are providing the correct training, leadership, and skills necessary to ensure success. In this regard, Mr. Terrence Wilcutt, the Chief of SMA, gave the ASAP an updated briefing on this topic.

OSMA has pulsed the Centers and has looked at what is available today. They believe that they have a document that they can use. It was developed at Johnson Space Center (JSC) by Mr. Scott Johnson, who is involved in the CCP. That document will be circulated among the Centers and the programs for comment for adaptation Agency-wide. They also believe that the current training programs need to be refined and enriched so that they meet the changes that are evolving with the skill sets that will be needed. The ASAP believes that this is a high priority, not necessarily for today, but certainly as the Agency transitions. Hopefully, by the end of this year, this will be accomplished. The Office of Safety and Mission Assurance (OSMA) is aggressively working on this effort, and Mr. Wilcutt believes that they can codify it in a document in the near future.

**COMMERCIAL CREW UPDATE**

Dr. Bagian noted that VADM Dyer had provided an overview of many of the issues in his opening remarks. Mr. Phil McAlister briefed the ASAP on the current status and discussed the upcoming flights for commercial resupply. Because additional materials were taken to ISS by STS-135, there are no resupply issues until 2013, even without any commercial resupply flights. However, if the partners' services are not available by 2013, the situation becomes more challenging. Mr. McAlister pointed out that SpaceX's first mission will be in March 2012. The program viewed this delay as a positive thing—SpaceX and NASA are taking appropriate steps to make sure things work and that they get it right.

For Commercial Crew, Mr. McAlister emphasized that initially there was to be a phase 1 (integrated design) and a phase 2 (development, test, evaluation, and certification). With the 52% reduction in budget, NASA decided that it was necessary to go to SAAs for phase 1. They have done that, and they acknowledge that there are a number of challenges, including increased uncertainties, which the ASAP believes equates to increased risk, an assessment with which Mr. McAlister concurred. This will require other countermeasures and more diligence to ensure risk is understood and appropriately managed. Phase 2 is still planned to be under a FAR-type contract. The biggest challenge is what happens between now and then. For many years the ASAP emphasized that the human rating requirements needed to be defined early; however, it was three to four years before this was achieved. Similarly, we now find ourselves in a situation in phase 1 that will not be as constrained under the SAAs as under FAR-based contracts. It is now even more important to understand what the certification requirements are going to be. While performance requirements have been promulgated, how those will be demonstrated to NASA's satisfaction has not been defined. The certification requirements have been addressed at a high level, but not down to levels 3 and 4. During the discussions this morning, the program indicated that they are targeting to have those defined by the end of the summer. The ASAP believes the sooner the better. Without those requirements, the uncertainty goes up, the risk goes up, and NASA could arrive at a place where various commercial ventures either are unable to demonstrate that they satisfy NASA's published



requirements, or NASA is pressured to accept more risk than intended. The best way to avoid this undesirable situation is to define the certification processes and requirements up front. Dr. Bagian stated that the recommendation that the ASAP should make is not only to define those certification requirements and standards, but the schedule by which they will be developed and promulgated. This needs to be done forthwith.

Mr. Marshall commented that on the general topic of commercial crew, it is important to note that the 2011 Annual Report did not reflect the “sea change” change described by VADM Dyer in his opening remarks, but it was a matter of timing, not an intentional omission. Mr. Marshall further noted that this change is not well known or well understood at this time, but the Agency will work aggressively to reiterate its mission and its policy. It is clear that the mission and policy will be driven by funding and will have impacts on the programs as they go forward.

VADM Dyer added that much of the need for clarity speaks to the “white space” between insight and oversight. How do you get some distance, provide the freedom, but later have the insight to certify the system is safe for crew transport? The ASAP has spoken to this. However, it must be noted that a few demonstration flights does not criteria make. There must be a firm basis for confidence or a statistically large number of demonstrations.

Mr. Marshall reported that on Tuesday and Wednesday of this week, he participated in the Agency’s Inter-center Aircraft Operations Panel (IAOP) Manager’s meeting as they reviewed their aviation programs. NASA has a fleet of manned and unmanned vehicles, and they are actively involved in aeronautic research, as well as Earth science studies and missions. Flying NASA’s airplanes requires a high level of proficiency. Historically, NASA has done a good job of getting proficiency flying time for its crews by using hours that are allocated to and funded by the various projects. Unfortunately, with the erosion of NASA’s budget, NASA’s flying hours also have decreased. In the last seven years, the amount of flight time has decreased by over 30 percent and the number of sorties has decreased by over 37 percent. While today erosion of flying time has not reached a critical level, if it continues into the future, the Agency will not have the prerequisite flying time necessary for all its crews to stay proficient. This is a concern. Mr. Marshall recommended that NASA investigate the risk of reliance on the historical approach for maintaining pilot proficiency considering anticipated further budget reductions. This includes an assessment of the need to develop a centrally-funded flight training budget so as to ensure that all NASA pilots maintain flight proficiency for the execution of their missions.

There were no other general or specific comments.

Before adjourning the meeting, VADM Dyer publically thanked Ms. Joyce McDevitt, Mr. John Marshall, and Ms. Deborah Grubbe for their service on the ASAP since 2003. He noted that they have been “amazing contributors, wonderful teammates, and great partners.” NASA and the nation owe a great debt to each. At a ceremony the previous day, the NASA Administrator awarded the NASA Exceptional Public Service Medal to Ms. McDevitt and Mr. Marshall. Ms. Grubbe was not able to attend this meeting or the ceremony, but is likewise appreciated and will be recognized with the same award.