

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

April 9, 2010

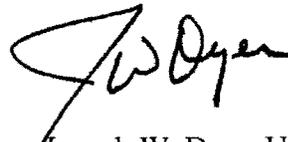
Dear General Bolden:

The Aerospace Safety Advisory Panel (ASAP) reviewed NASA's responses dated March 15, 2010, to ten of the ASAP's 2008 and 2009 recommendations. We are extremely pleased with the thoroughness of the responses and the level of detail provided in NASA's discussion and in particular with the overall tone suggesting that the recommendations were seriously considered. We closed seven of the recommendations based on the agency's response; some with requests for future updates or with ASAP comments provided. We continue to strive for greater improvement than that reported to date on the remaining three (Recommendations 2009-03-06, 2009-01-2a, and 2008-02-07) for which the ASAP maintains an open status. Comments for the recommendations are provided in the Enclosure.

In addition, the ASAP offers its services as a sounding board for the development of the standard for safety goal evaluations in assuring, as an example, realistic benchmark examples for the goals and thresholds.

We look forward to seeing you in April during our quarterly meeting at Headquarters.

Sincerely

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

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

Enclosure

## ASAP Review of NASA Responses dated March 15, 2010

1. Recommendation 2009-03-06, Human Rated Requirements for COTS: The focus of this recommendation was on the timeliness of completing the development of HRR for COTS so that the requirements documentation can be promulgated as soon as possible - even before the authority and direction have been formally given to NASA to pursue commercial crew transportation systems. The ASAP recommends that a more aggressive approach be taken in developing the HRR including implementing the "Process for Developing Safety Goals for NASA's Mission" to define the quantitative safety goals for COTS now and not some time in the future. Since the NASA response provides no discussion of the tasks, milestones, and schedule that NASA intends to pursue in developing HRR for COTS nor the associated progress being made, the NASA response provides no evidence that the work is being performed in a timely manner. The ASAP has stasured this recommendation as Open based on NASA's March 15, 2010, response and will follow up with this subject during the Commercial Space agenda topic at the ASAP April meeting to determine the extent to which progress is being made.
2. Recommendation 2009-01-02a, Constellation Program (CxP) Implementation of HRR: See Recommendation 2009-03-06 relating to the process for establishing quantitative safety goals and the need for determining quantitative safety goals for COTS now. In addition, for any potential launch providers, e.g. cargo flights, human flights, International Providers' HTVs and ATVs, this work should be started now so that the process can be thoroughly fleshed out for various customers and classes of vehicles that may be considered. When the Program Formulation Authorization is provided, this work should essentially be done so that the HRR and program requirements can be fine tuned to support achievement of the goal. The ASAP has stasured this recommendation as Open based on NASA's March 15, 2010, response and will follow up with this subject during the Commercial Space agenda topic at the ASAP April meeting to determine if there are any issues associated with performing the analysis now in conjunction with developing the policy. In addition, the ASAP offers its services as a sounding board for the development of the standard for safety goal evaluations in reviewing and commenting on early drafts.
3. Recommendation 2009-01-02b, Application of Data Mining Methodology to CxP: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has stasured this recommendation as Closed. The ASAP requests that NASA provide an update on completion of the pilot APA study.
4. Recommendation 2009-01-02c, CxP Integrated Risk Analysis and Approval: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has stasured the recommendation as Closed.
5. Recommendation 2008-02-01, NSC Participation in Standards: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has stasured the recommendation as Closed.

6. Recommendation 2008-01-05, NSRS Benchmarking: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has statused the recommendation as Closed.
7. Recommendation 2008-02-07, Accident Review Timeliness: The NASA response dated March 15, 2010, to this recommendation indicates that NASA has completed several actions in various areas to revitalize its safety data management system. Improved processes have been instituted for performing root cause and trending analyses and to increase visibility of the statistics to executive management and Agency wide. The NASA response recommends closure on portions of the plan with two actions remaining open for completion this year and the ASAP concurs with this status. What the ASAP finds still lacking in the NASA response is the executive summary that provides overall evidence that the timeliness of the entire accident investigation process, starting with the initial report of the mishap occurrence through to endorsement of the accident investigation board report including development and closeout of the corrective action plan, has improved . The ASAP is hopeful that the agenda item, Mishap Investigation Process and Metrics, planned for the April quarterly meeting at NASA Headquarters can provide evidence that the overall timeline has indeed been shortened since the time the ASAP directed attention to this area in Recommendation 2007-04-02, "NASA Headquarters needs to provide for more timely completion, review and release of major mishap investigation reports, utilizing the support of the NASA Safety Center if needed. Such increased emphasis on expeditious handling of the investigation findings will ensure that the lessons learned from the investigation are disseminated throughout the agency as soon as possible, to correct unsafe conditions and help prevent a recurrence of the mishap."

With regard to Recommendation 2008-02-07 concerning the process for investigating mission and test failures, NASA provided an excellent summary of the guidelines used in identifying and reacting to mission and test anomalies. In that discussion, two examples of "natural phenomena" were cited as not being considered mishaps to be investigated and learned from. The first was the ISS being struck by an unspecified size meteor. The second was NASA property damage resulting from weather such as lightning, high winds, snow loads, flood and wildfire. While all of the conditions highlighted can sometimes be of such magnitude that they exceed established design limits and would legitimately qualify for a "natural phenomenon" exemption, it would appear that a blanket exemption for any natural phenomenon related damage would miss those cases where proper design or administrative procedures should have been capable of protecting the assets, but failed to do so. Examples include damage allowed by defective lightning protection systems, flood damage caused by failure to maintain dikes in flood prone areas, structural building failure when exposed to predictable snow loads, trailers blown over by strong winds because they were not properly secured, and loss of the ISS from a MMOD impact of a type and trajectory that should have been recoverable. The ASAP recommends that the "natural phenomenon" exemption be

clarified to only apply to those events that exceed the intended capabilities of the applicable protective systems and procedures.

8. Recommendations 2008-02-08, Fall Protection Standard: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has stasured this recommendation as Closed.
9. Recommendation 2008-03-02, Industrial Safety Metrics: The NASA response dated March 15, 2010, to this recommendation is acceptable and the ASAP has stasured this recommendation as Closed. The ASAP has requested that the agency-level metrics be presented at its April meeting at NASA Headquarters.
10. Recommendation 2008-03-05, Open CAIB Recommendations: The ASAP has stasured this recommendation as closed; however we still have reservations with the approach taken by NASA. We understand from the NASA response that the Return to Flight (RTF) Implementation Plan reflects a closed status for the three CAIB recommendation determined by the RTG Group as "intent not met" because no further mitigation measures were planned. We also understand from the NASA response that NASA formally accepts the residual safety risk associated with each of these three CAIB recommendation prior to each Space Shuttle flight, and the ASAP concurs with the need for this as each flight would have its own inherent safety risk to reflect e.g., failures, problems and anomalies learned from previous flights. For this reason, the ASAP will continue to need an annual update pertaining to these three CAIB recommendations from NASA in providing an updated report to Congress on this matter until Shuttle retirement. What is missing from the NASA approach is the formal acceptance and documentation of the safety risk at the time that the Program decision was made to close the recommendations. The practice that the agency needs to institutionalize is that whenever a program decision is made that has an explicit or implicit acceptance of safety risk associated with that decision that the safety risk be accepted formally and documented for the permanent program record.