

National Aeronautics and Space Administration  
Office of the Administrator  
Washington, DC 20546-0001



October 6, 2011

Vice Admiral Joseph W. Dyer, USN (Ret.)  
Chair  
Aerospace Safety Advisory Panel  
National Aeronautics and Space Administration  
Washington, DC 20546

Dear ~~Admiral~~ <sup>Joe</sup> Dyer:

Enclosed are NASA's responses to Recommendation 2011-03-01 and 2011-03-02 from the 2011 Third Quarterly Meeting of the Aerospace Safety Advisory Panel (ASAP). Please do not hesitate to contact me if the ASAP would like further background on the information provided in the enclosures.

I look forward to receiving continued advice from the ASAP that results from your important fact-finding and quarterly meetings.

Sincerely,

A handwritten signature in black ink, appearing to read "Charles F. Bolden, Jr." with a stylized flourish at the end.

Charles F. Bolden, Jr.  
Administrator

2 Enclosures:

1. 2011-03-01 Abort Effectiveness Requirement
2. 2011-03-02 Partner Integration Team (PIT) Rotation

**ASAP Tracking Number 2011-03-01**  
**Abort Effectiveness Requirement**

**Finding**

In addition to top level Loss of Crew (LOC) probability, the current commercial crew safety requirements include a specific requirement for an abort system with a specified effectiveness. During discussions with the Commercial Crew office, it was revealed that consideration was being given to deleting the abort effectiveness requirement and relying on the top level LOC probability calculations to drive whatever abort effectiveness is required to meet the 1/1000 ascent LOC requirement.

**Recommendation**

The Panel recommends that requirements for abort system effectiveness be retained as a safety requirement.

**Rationale**

While theoretically, LOC probability calculations will include abort effectiveness contributions, the failure to specify an abort effectiveness minimum requirement could allow utilization of an ineffective abort system if high levels of booster reliability are predicted by Probabilistic Risk Assessment (PRA) analyses. Unfortunately, PRAs cannot include consideration for unknown or unpredicted failure modes. An abort system is the “last line of defense” against such failure. There is little benefit to even requiring an abort system if its minimum effectiveness is not specified.

**NASA Response**

The current draft of CCT-REQ-1130, ISS Crew Transportation and Services Requirements Document, includes an abort effectiveness requirement. It also includes a requirement to provide a launch abort capability from the launch pad until orbit insertion to protect against loss of ascent thrust and loss of attitude or flight path control failures. However, the effectiveness requirement does not currently specify a “number” to verify against, but rather is shown as “To be Determined.” NASA’s Commercial Crew Program is currently considering and re-evaluating the requirements related to the abort system performance and effectiveness.

NASA is considering these changes due to the desire to have more effective verifications of the requirements and from receiving industry feedback.

The proposed requirements changes are still under review. NASA will communicate our requirements and rationale to the ASAP at the next meeting tentatively scheduled for October 2011.

**ASAP Tracking Number 2011-03-02**  
**Partner Integration Team (PIT) Rotation**

**Finding**

The Commercial Crew Program (CCP) will utilize embedded PIT members to closely follow and guide commercial partner design processes to help ensure that their result meets NASA expectations and requirements. The Panel recognizes the importance of this method of obtaining insight and encourages it. However, caution must be exercised to prevent these Government representatives from psychologically and culturally becoming part of the partner's team mentality, or "going native."

**Recommendation**

The Panel recommends that the CCP develop a written policy specifying team rotation schedules based on tour of duty, milestones, or other appropriate criteria, to ensure a fresh set of eyes are always protecting the Government's interest for the insight portion of the acquisition strategy.

**Rationale**

History has shown that buyer representatives embedded with supplier development teams are subject to "bending the rules" to aid the development team that they begin to feel part of. Preplanned rotation is one means of minimizing this effect.

**NASA Response**

The CCP does not intend to adopt a policy of forced rotations for PIT leadership members from the Program Office. However, we have a strategy that will ensure a consistent approach to insight while providing a diverse team to perform the insight role. We will add this to the list of topics to be included in our next presentation to the ASAP tentatively scheduled for October 2011. In preparation for that presentation, the following is a top-level description of our insight approach:

The CCP plans to acquire insight through the use of an assigned PIT. PITs will not be giving direction to the commercial partners about risk acceptance or activities related to requirements since the CCP will not require approval (oversight) of activities below the program level. PIT members will work side-by-side with the commercial partner engineers and will coordinate the support of additional NASA expertise to aid in the resolution of technical issues. However, the PIT members will not be required to sign or approve any products from the commercial partners. Deliverables will be focused on engineering, design, and test data and will not require individual NASA engineering approval to be submitted.

Also, within the Commercial Crew Program Office, there is a small group of civil servants in the Spacecraft Systems Office. The role of that office is to provide a comprehensive and consistent application of requirements for all the commercial partners to ensure that there is no favoritism or discontinuity in how we are dealing with requirements among the commercial partners.

In addition, NASA technical authority and governance will be accomplished at the program level. Problem reports, manufacturing procedures, and vendor processes are just some examples where the CCP will need insight by the PIT. CCP insight is focused on any impacts to the top-level program requirements or impacts to the system certification package.

Given this, the CCP wants the PIT members to be as experienced and knowledgeable as possible about their partner's system design and technical attributes. Forced rotations actually work against that objective. Also, since the PIT members do not give direction to the commercial partners, they do not have the ability to "bend the rules" to aid the development team. The "rules" will be enforced via oversight at the program office level.