

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



January 22, 2015

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

Dear ~~Admiral~~ ^{Jos} Dyer:

In response to your letter dated November 17, 2014, NASA provides the following response to your concern regarding 2014-AR-05, Process for Managing Risk with Clear Accountability. Please contact me if the ASAP would like further background on the information provided in the enclosure.

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

Enclosure:
2014-AR-05 – Process for Managing Risk with Clear Accountability

Aerospace Safety Advisory Panel Recommendation
Tracking Number 2014-AR-05
Processes for Managing Risk with Clear Accountability

Finding:

In 2013, NASA took a very positive step in documenting and clarifying the Technical Authority responsibilities. This formalization represents a practice that should be followed more generally—for example, in the informal process of validating the Safety and Mission Success budget to avoid an unfortunate budgeting structure at NASA Headquarters.

Recommendation:

NASA should consistently provide formal versus ad hoc processes for managing risk with clear accountability.

Rationale:

Reliance on the quality and integrity of personnel to “do the right thing” makes risk management personality-dependent rather than part of a formal process.

NASA Response:

NASA concurs and recognizes the importance of implementing and executing a single-signature risk acceptance process that holds individuals accountable for spaceflight system risk acceptance decisions, during the development of acquisition strategies and throughout the program/project life cycle, from concept studies through closeout.

NASA Procedural Requirements (NPR) 8000.4, *Agency Risk Management Procedural Requirements*, defines risk as the potential for shortfalls relative to defined requirements. NASA understands ASAP’s concern not only to be the management of risk relative to requirements, but also the processes by which acceptable levels of risk are established and codified into the requirements themselves.

Where crew safety is concerned, NPR 8705.2B, *Human-Rating Requirements for Space Systems*, places ultimate accountability for spaceflight safety with the NASA Administrator. The Administrator establishes mission-type specific level thresholds that serve as policy statements regarding the levels of risk that the Agency is willing to accept. This means that the Agency would not knowingly subject risk-takers to higher risk than that stated by the thresholds, absent special justification and acceptance by the Administrator. Safety thresholds are then allocated, as probabilistic safety requirements, into the appropriate programs by the Associate Administrator for the responsible Mission Directorate. Within each program, the Program Manager is then responsible for allocating them further into mission phases and system elements and documenting these allocations in the Human Rating Certification Package (HRCP) at System Requirements Review (SRR).

Per NPR 7120.5, *NASA Space Flight Program and Project Management Requirements*, the development of spaceflight systems is evaluated at key decision points (KDPs), at which point the decision authority examines the maturity of the project, including the technical and

nontechnical risks, and determines the readiness of a program/project to progress to the next phase of the life cycle (or to the next KDP). Each KDP functions as an integrated, system-level roll-up of the many decisions at many levels in the organization through which risk has been implicitly or explicitly accepted up to that point, and a decision to proceed represents both formal acceptance of this risk and acceptance of responsibility for this risk going forward.

Per NPR 8000.4, between KDPs, risk management is conducted as part of program/project execution, and a myriad of decisions are made that affect systems' safety performance. Individual risk issues are identified, analyzed, and responded to, including decisions to accept risk. Per NASA Policy Directive (NPD) 8700.1, *NASA Policy for Safety and Mission Success*, all technical decisions resulting in residual safety and/or mission success risk require formal acceptance of the risk by the applicable program, project, or operations and facilities manager, with approval/concurrence of the cognizant Technical Authority (TA) and formal approval by the cognizant Safety and Mission Assurance (SMA) authority that the risk is acceptable. Consistent with NASA's core value of safety, there is an expectation that decisions will be made with a bias toward safety, such that systems are made as safe as reasonably practicable (ASARP).

NASA commits to reviewing and modifying its directives (including those mentioned above) as appropriate to ensure that crew safety risk acceptance accountability and public safety risk acceptance accountability are firmly fixed with specific actors at the appropriate organizational levels, at appropriate points in the strategic acquisition process, and at appropriate program and project KDPs. In particular, NASA will:

- Review and evolve its strategic acquisition process to ensure that formal, single-signature accountability for risk acceptance associated with acquisition decision-making is clearly established.
- Review and evolve its KDP requirements to ensure that formal, single-signature accountability for risk acceptance associated with KDP decision making is clearly established.
- Review and evolve its risk management requirements to ensure that risk acceptance decisions are consistent with the ASARP principle and that a transparent process of risk acceptance accountability is implemented.
- Provide a template (or templates) for documenting single-signature risk acceptance and associated concurrences.

The estimated timeframe for implementing these actions is 12 months.