

NASA AEROSPACE SAFETY ADVISORY PANEL

National Aeronautics and Space Administration

Washington, DC 20546

Lieutenant General Susan J. Helms, *Chair*

May 8, 2024

The Honorable Bill Nelson
Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Senator Nelson:

The Aerospace Safety Advisory Panel (ASAP) held its 2024 Second Quarterly Meeting in-person at NASA's Johnson Space Center Headquarters, April 15-17, 2024. We greatly appreciate the participation and support that were received from NASA's leadership, the subject matter experts, and the support staff.

The Panel submits the enclosed Minutes resulting from the public meeting for your consideration.

Sincerely,

A handwritten signature in cursive script, appearing to read "Susan Helms".

Susan J. Helms, Lt Gen (Ret), USAF

Chair

Enclosure

AEROSPACE SAFETY ADVISORY PANEL

Public Meeting

April 17, 2024

Hybrid

2024 Second Quarterly Meeting Report

ASAP Panel Member Attendees

Lieutenant General Susan J. Helms, USAF (Ret), Chair

Mr. William Bray

Dr. Amy Donahue

Mr. Paul S. Hill

Mr. Kent Rominger (*virtual*)

Dr. Mark N. Sirangelo

Dr. Richard S. Williams, MD, FACS

ASAP Staff and Support Personnel Attendees

Ms. Carol Hamilton, NASA ASAP Executive Director

Ms. Lisa Hackley, NASA ASAP Administrative Officer

Ms. Ashley Mae, Tom & Jerry, Inc, Technical Writer

[Appendix A – Teleconference Attendees](#)

[Appendix B – Statements](#)

Ms. Carol Hamilton, Aerospace Safety Advisory Panel (ASAP) Executive Director, called the meeting to order at 3:00 p.m. central daylight-saving time (CDT) and welcomed everyone to the ASAP's Second Quarterly Meeting of 2024, held at the Johnson Space Center (JSC) National Aeronautics and Space Administration's (NASA) Headquarters. Ms. Hamilton noted that the Federal Registry Notice gave the public the opportunity to send safety-related statements or to make comments prior to the scheduled meeting.

Lieutenant General (LTG) Susan J. Helms, United States Air Force (USAF)(Ret), chair, began by thanking Ms. Vanessa Wyche and Mr. Willie Lyles for their hospitality at JSC.

Dr. Donahue discussed safety culture, which includes NASA's efforts to employ, sustain, and evaluate effective risk management practices and to foster a healthy organizational climate, and is a cornerstone of the Panel's focus. Dr. Tracy Dillinger presented insights from the last Agency-wide safety culture survey in 2022, underlining its role in trend tracking and identifying areas of concern. The Panel extends its interest beyond safety culture, encompassing broader organization elements such as leadership, communication, and team dynamics, and their implications for safety. Dr. Donahue noted that the voices of Technical Authorities (TA) appear to be impactful and the workforce seems able to raise concerns related to risk and safety. Especially given the dynamic and stressful nature of NASA's operational environment, clear communication in program management is imperative to ensure the workforce understands the Agency's intent and rationale.

NASA grapples with constrained resources, compounded by ongoing operations and challenging fiscal landscapes. Associate Chief Financial Officer, Mr. James Worm, provided the Panel with a comprehensive briefing on the Agency's Fiscal Year (FY) 2025 budget request, emphasizing associated risk. Key concerns include securing adequate resources for International Space Station (ISS) operations until 2030, transitioning to commercial low Earth orbit (LEO) destinations (CLDs), addressing infrastructure damage, and managing budget reductions in safety, security, and mission services. The Panel stressed the necessity of evaluating NASA's intellectual, workforce, and infrastructure requirements to support current and future missions. Ongoing efforts within the Exploration Systems Development Mission Directorate (ESDMD) aim to rationalize resources, focusing on budgetary efficiency and optimization. Dr. Donahue concluded that resource allocation and utilization play pivotal roles in shaping risk management and mission success within NASA, underscoring the ongoing importance of monitoring the Agency's budgetary landscape.

LTG Helms addressed the fact that the Panel had not been able to have fact-finding discussions with the Commercial Crew Program (CCP) and the ISS at the last Quarterly meeting but had since met with them and that Mr. Kent Rominger would be leading the discussion of CCP, with a focus on the upcoming Boeing Crew Flight Test (CFT) and summarizing SpaceX accomplishments and status.

Mr. Kent Rominger noted that SpaceX achieved several milestones, including the successful launch and docking of Crew-8, and the successful landing of Crew-7. Boeing's accomplishments for the fourth quarter of 2023 include successful execution of the drop test and closure of the final Orbital Flight Test-2 in-flight abort. The Boeing Starliner CFT is scheduled for early May, with progress noted in certification products and flight readiness. The report details the status of various components, including the Crew and service modules, propellant loads, and software readiness. Notable updates include the completion of parachute tests and the closure of risks related to the active thermal control system valve failure. Overall, Mr. Rominger noted, the Panel acknowledges the significant progress made by both SpaceX and Boeing in the last two quarters, expressing satisfaction with Boeing's advancement towards CFT launch readiness.

LTG Helms provided a retrospective of the Panel's engagement with the CCP leading up to the imminent first crewed test mission of the Starliner spacecraft. Since the inception of the CCP, the Panel has actively collaborated with the CCP office, delving into technical issues of both SpaceX and Boeing spacecraft and engaging in safety-related discussions with senior leadership and independent TAs.

Following Boeing's first uncrewed Orbital Flight Test in late 2019, which did not meet its primary objectives, the Panel intensified fact-finding efforts with a heightened focus on the program. Notably, after the successful re-flight of the uncrewed Orbital Flight Test in 2022, the Panel continued to track substantive technical issues for the first crewed flight, publicly discussing their findings and observations in quarterly meetings. As the launch date approaches, the Panel has escalated fact-finding activities in alignment with NASA's pre-launch preparations. Recent engagements include sessions with the CCP office, candid interviews with key stakeholders, and reviews of the Certification of Flight Readiness (CoFR) process for the CFT.

The Panel is actively observing key readiness reviews leading up to the CFT, ensuring robust discussions on risk management and continuing to highlight key risk areas and potential blindspots to NASA leadership.

LTG Helms highlighted NASA's mature risk management framework and healthy safety culture, indicating readiness for the challenges of the crewed Starliner test flight. However, recognizing the complexities of test flights, the Panel emphasized the importance of preparedness for contingencies and urges clear delineation of decision-making authorities and responsibilities during the mission. The Panel expressed confidence in NASA's processes to support readiness determination for the upcoming Starliner test flight while underscoring the need for comprehensive contingency planning and decision-making protocols.

LTG Helms then handed over the meeting to Dr. Richard Williams to discuss the updates of the ISS. Dr. Williams acknowledged Ms. Dana Weigel's recent promotion to ISS Program Manager (PM), commending her clarity and openness in discussing the program's status and future. Outgoing PM, Mr. Joel Montalbano, was also praised for his contributions.

Three key issues were addressed. 1) The persistent pressure shell PRK leaks from the Russian Service Module have ongoing investigations open delving into probable causes and operational measures to manage the issue. Long-term impacts and isolation options are being explored. 2) Damage in on-board emergency masks led to redesign efforts, with original masks cleared for use until August. Alternative breathing masks are being evaluated for post-fire or toxic spill events. 3) Concerns regarding the lack of an executable ISS deorbit plan were raised, with steps being taken to conserve propellant for potential unplanned deorbit scenarios. Plans involve utilizing the United States Deorbit Vehicle (USDV) to facilitate controlled deorbit burns.

Dr. Williams then transitioned to health and medical risks, highlighting the Panel's emerging focus in this area, which is heavily dependent on access to LEO for risk characterization and mitigation.

The meeting with Dr. JD Polk, NASA's Chief Health and Medical Officer, along with members of the NASA space medical staff and the Human Research Program (HRP), addressed several key issues regarding human health in spaceflight. The discussion highlighted the relationship between the Health and Medical TA (HMTA) and the HRP, emphasizing their collaborative efforts to address gaps in human health risk knowledge and mitigate associated risks. Budgetary constraints were expressed as a concern, potentially impacting the ability to provide adequate HMTA coverage for evolving human spaceflight programs. Dr. Polk expressed concerns about the impending ISS transition and the potential gap in access to LEO research facilities, emphasizing the need for continued research in this environment to mitigate mission risks, particularly for long-duration exploration missions.

Two emergent highest-level risks, Spaceflight Associated Neuro-Ocular Syndrome (SANS) and internal jugular deep venous thrombosis, were discussed in detail. SANS, with a significant attack rate among crewmembers, has variable severity and potential long-term implications, while internal jugular deep vein thrombosis, recently described on the ISS, is being studied for its association microgravity exposure. The Panel was briefed on efforts to investigate potential

countermeasures for SANS and jugular venous thrombosis, including physical and pharmacologic interventions.

Dr. Williams expressed the Panel's appreciation for the comprehensive overview of NASA's integrated crew health risk mitigation efforts and looks forward to further engagement with Dr. Polk and HRP management.

LTG Helms directed the meeting to Mr. William Bray to lead the discussion on the Moon to Mars (M2M) Program. Mr. Bray stated that the ESDMD provided a comprehensive update, highlighting progress on Artemis III science efforts and lunar rover study contracts. Additionally, they initiated a Sustainable Cost Reduction and Risk Balance (SCRRB) review to ensure budget efficiency and integration of processes.

Under the M2M Program, Mr. Amit Kashtriya provided assurance regarding safety, program, and technical risks management for Artemis II. Progress on critical items such as the crew and service module hatch door and heat shield with CoFR for a September 2025 launch remain on track. The heat shield continues to be on the critical path for Artemis II and the Agency is moving to resolution on the root cause with recommended mitigations for Artemis II and beyond. For Artemis III, the focus is centered on the Human Landing System (HLS) and its concept of operations. The Panel received an excellent brief on the technical approach and test plan for propellant transfer, demonstrating a solid, yet challenging, plan to meet Artemis III timelines.

Mr. Bray noted the progress on Artemis IV and the Program's broad mission perspective across Artemis II through IV was viewed positively. Updates to the risk management process were acknowledged, and continued constructive support from the entire NASA team was emphasized as a key to success given the complexity of the Artemis Campaign.

LTG Helms, in closing, discussed how the ISS transition was a focus area of the Panel's 2023 Annual Report, leading to new recommendations. Ms. Robyn Gatens provided an update from the ISS transition program office on addressing the Panel's questions regarding transition risks. It was conveyed that the office plans to adopt the same framework used for developing the M2M Mission Objectives in late 2022. LTG Helms commended this effort.

Ms. Hamilton opened the meeting for public comment. No comments were received.

LTG Helms adjourned the ASAP Second Quarterly meeting of 2024 at 4:00 p.m. CDT.

Appendix A
Teleconference Attendees¹

Amanda Miller	<i>Military.com</i>
Beverly Perry	<i>NASA</i>
Carrie Rodgers	<i>GAO</i>
Desiree Seeword	<i>NASA</i>
Donald Wood	<i>NASA</i>
Gene Mikulka	<i>Talking Space</i>
Jackie Wattles	<i>CNN</i>
Jared Stout	<i>Axiom Space</i>
Jeff Foust	<i>Space News</i>
John	<i>SpaceX</i>
Johnny Nguyen	<i>NASA</i>
Josh Sinch	<i>NASA</i>
Joy Kim	
Kathryn Hambleton	<i>NASA</i>
Lane Holak	<i>NASA</i>
Lora Bleacher	<i>NASA HQ</i>
Loren Grush	<i>Bloomberg News</i>
Marcia Smith	<i>Space Policy Online.com</i>
Micah Maidenberg	<i>Wall Street Journal</i>
Michael Massey	<i>NASA JSC</i>
Pam Whitney	<i>Science Committee</i>
Pat Forrester	<i>NASA</i>
Rachel Kraft	<i>NASA</i>
Ramona	<i>NASA</i>
Ramona Gallardo	<i>NASA JSC</i>
Stephen Clark	<i>ARS Technica</i>
Sylvie Espinasse	<i>European Space Agency</i>
Veronika Fuhrmann	<i>European Space Agency</i>
Zudayyah Taylor-Dunn	<i>NASA</i>

¹ The names and affiliations are as given by the attendees, and/or as recorded by the teleconference operator.