

NASA AEROSPACE SAFETY ADVISORY PANEL

National Aeronautics and Space Administration

Washington, DC 20546

Lieutenant General Susan J. Helms, *Chair*

February 14, 2025

The Honorable Janet Petro
Acting Administrator
National Aeronautics and Space Administration
Washington, DC 20546

Dear Ms. Petro:

The Aerospace Safety Advisory Panel (ASAP) held its 2025 First Quarterly Meeting in-person at NASA's Johnson Space Center, January 21-23, 2025, with the public meeting on January 30, 2025. 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,



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

Chair

Enclosure

AEROSPACE SAFETY ADVISORY PANEL

Public Meeting

January 30, 2025

Hybrid

2025 First 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

Ms. Katharina McFarland

Mr. Charlie Precourt

Mr. Kent Rominger

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

Ms. Carol Hamilton, Aerospace Safety Advisory Panel (ASAP) Executive Director, called the meeting to order at 1:00 p.m. eastern standard time (EST) and welcomed everyone to the ASAP's First Quarterly Meeting of 2025, held at the National Aeronautics and Space Administration's (NASA) Johnson Space Center (JSC). The Federal Register notice had provided an opportunity for the public to submit verbal presentations or written statements on NASA safety, but no such submissions had been received. She clarified that while public comments would be permitted at the end of the meeting, questions would not be entertained. With this, she handed the meeting over to Lieutenant General (LTG) Susan Helms, the ASAP Chair.

LTG Helms began by reflecting on the challenges faced during the First Quarterly, which was held the previous week in Houston, Texas. The meeting was impacted by significant weather disruptions, which prevented some of the intended in-person engagements. However, NASA's virtual meeting technology allowed for all scheduled discussions to take place, ensuring that the fact-finding process remained uninterrupted. Ms. Vanessa Wyche was recognized for her efforts in ensuring the success of the virtual engagements despite the weather-related challenges.

LTG Helms noted that, during their time in Houston, the Panel had the opportunity to participate in NASA's Day of Remembrance, an annual event held in January to honor members of the NASA family who lost their lives in the pursuit of exploration and discovery. The timing of this year's meeting allowed the Panel to reflect on the importance of safety and risk management,

which remains central to NASA's operations. She then introduced Mr. Paul Hill to provide an update on the Orion heat shield issue, a subject that had been closely monitored in previous meetings.

Mr. Paul Hill provided an overview of NASA's assessment and response to the Artemis 1 heat shield charring issue that was encountered during re-entry in December 2022. The investigation revealed that the Artemis 1 heat shield had been constructed with an impermeable ablator, preventing the expected pyrolysis gas from venting. This resulted in gas pressure build up within the material, leading to horizontal cracking and widespread charring. While some level of ablator charring is a normal phenomenon, the unexpected loss of sizable char pieces was not anticipated.

To address this issue, NASA has developed corrective actions, which include transitioning to a permeable ablator material for Artemis 3 and future missions. The new material will eliminate gas pressure buildup and prevent the resulting char loss. However, Artemis 2 will still use the impermeable heat shield, though its trajectory will be modified to significantly reduce pressure buildup during re-entry. While some level of char loss may still occur, recent ground tests suggest that horizontal cracking and charring will be substantially mitigated.

A contributing factor to this anomaly was a manufacturing change from the Apollo program that inadvertently reduced material permeability. As a result, NASA has now directed all program-wide teams to reassess heritage systems to ensure that similar unintended consequences are not present elsewhere. Mr. Hill noted that NASA's decision to pursue a deep understanding of the heat shield anomaly—despite the seemingly adequate performance of Artemis 1—demonstrated its commitment to thorough risk assessment. An independent review team was also engaged to validate NASA's conclusions, fully supporting the agency's findings and its rationale to fly Artemis 2 as planned.

Mr. William Bray then provided an update on Artemis 3 and the ongoing engineering activities for subsequent Artemis missions. With the Artemis 1 heat shield issue now thoroughly investigated and a forward plan established, NASA is better positioned to assess the risk landscape for Artemis 3 and beyond. However, Artemis 3 poses unique challenges, as it will be a mission full of firsts, including the introduction of a new heat shield, the Human Landing System (HLS), extravehicular activity (EVA) suits, the Lunar Terrain Vehicle (LTV), and the Gateway station. Each of these elements introduces distinct risks, and when combined, they increase the overall risk posture for the mission.

Mr. Bray emphasized that NASA must carefully assess whether it is time to reallocate mission objectives to distribute risk more effectively across multiple test flights. He referenced the Apollo program's approach, where incremental testing ensured that systems were validated over time rather than stacking all first-time operations into a single mission. Establishing a more structured launch cadence would not only balance risk but also improve program stability, contractor coordination, and overall mission success.

During the meeting, the Panel engaged in discussions with the Moon to Mars Program Manager, Mr. Amit Kshatriya, about NASA's approach to risk balancing. Treating each Artemis launch as a structured test event would provide greater flexibility and help mitigate technical risks. The Panel

encouraged NASA to explore reconfiguring test sequences to ensure a smoother transition across all Artemis missions.

Mr. Bray also highlighted key updates on specific program components. The EVA suits are progressing toward a critical design review in the spring, and several ASAP members had the opportunity to visit Axiom Space's facility to review prototype suits and lab testing. The visit provided valuable insight into the progress being made. In terms of the HLS, SpaceX continues refining Starship's flight-testing program, making iterative improvements with each test. Meanwhile, Blue Origin successfully launched its New Glenn rocket, marking a significant milestone for the HLS program by ensuring that two independent industry partners are contributing to lunar lander development.

Mr. Hill provided an update on NASA's Commercial Crew Program (CCP), which continues to maintain a steady flight cadence with Crew Dragon and Boeing's Starliner. Recent missions—Crew-9, Crew-10, and Crew-11—have supported crew rotation aboard the International Space Station (ISS). Crew-10 will introduce a notable change, as it will be the first mission to conduct a West Coast recovery, reducing public risk from Dragon trunk re-entry debris.

Regarding Boeing's Starliner, NASA and Boeing teams are working through post-flight analysis of the Crew Flight Test (CFT). Several propulsion system anomalies remain under investigation, with independent review teams assessing root causes and recommending corrective actions. The Panel expressed confidence that NASA is focusing on the right core issues to ensure that Starliner can fly safely in future missions.

Mr. Hill and Ms. Katharina McFarland also discussed NASA's evolving approach to acquisition strategies and contract structures. The CCP has provided valuable lessons about how different contract models influence risk management. NASA is now examining whether these lessons can be applied to future commercial service contracts to optimize risk allocation and oversight.

Mr. Kent Rominger addressed concerns surrounding the aging ISS, which is facing structural challenges as it nears its planned decommissioning in 2030. The Russian Service Module Vestibule (PRK hull) has developed cracks that are increasing in severity. NASA and Roscosmos do not share a unified understanding of the root cause, with Russia attributing the issue to fatigue, while NASA believes it is more complex. Given the urgency of the situation, NASA has classified these leaks as the highest possible risk and has tasked an independent review Panel to assess the problem.

Efforts are also underway to finalize a deorbit plan for the ISS. NASA has contracted SpaceX to develop an ISS Deorbit Vehicle (USDV), with a projected launch in 2029 to ensure a controlled and safe deorbit process. However, significant budget constraints threaten these plans. The deorbit vehicle and supporting infrastructure will require over \$1 billion dollars, and if this funding must come from the existing ISS budget, it could compromise the safety of ongoing operations. The Panel stressed the need for adequate financial resources to maintain ISS safety while preparing for its end-of-life phase.

LTG Helms closed the meeting by reflecting on the importance of NASA's annual Day of Remembrance. She emphasized that NASA's history has shown that human spaceflight is an inherently risky endeavor, and continued vigilance is necessary to prevent future tragedies. As NASA navigates budget constraints, shifting programmatic priorities, and the transition to commercial spaceflight, it must maintain an unwavering focus on risk management.

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

LTG Helms adjourned the ASAP First Quarterly meeting of 2025 at 1:47 p.m. EST.

Appendix A

Teleconference Attendees¹

Dunn	<i>AP</i>	Kathleen Boggs	<i>BAE Systems</i>
Adie Lewis	<i>EAO</i>	Kenneth Chang	<i>NYT</i>
Adrian Clayton	<i>NASA</i>	Kristina Parmenter	<i>NASA</i>
Amanda Miller	<i>Journalist</i>	Laura Forczyk	<i>Astralytical</i>
Ashley Wilkins	<i>House Finance Committee</i>	Marcia Smith	<i>Spacepolicyonline.com</i>
Beverly Perry	<i>NASA</i>	Melanie Nanson	<i>NASA</i>
Bill Harwood	<i>CBS News</i>	Micah Maidenberg	<i>Wall Street Journal</i>
Britney Coffey	<i>Boeing</i>	Michael Eagen	<i>NASA</i>
Calvin Thompson	<i>NASA</i>	Michael Sheetz	<i>CNBC</i>
Carmen Anderson	<i>Contractor</i>	Michelle Green	<i>NASA</i>
Crystal Jones	<i>NASA</i>	Mike Ferro	<i>Boeing</i>
Dee Russell	<i>Boeing</i>	Mike Wall	<i>Space.com</i>
Dianna Oglesvy	<i>NASA</i>	Miles Doran	<i>CBS News</i>
Dillon Laville	<i>SpaceX</i>	Misty Snopkoski	<i>NASA</i>
Dimitra Tsamis	<i>NASA</i>	Nathan Vassberg	<i>NASA</i>
Donald Wood	<i>NASA</i>	Nell Greenfieldboyce	<i>NPR</i>
Erin Kennedy	<i>TAO</i>	Ramon Sanchez	<i>Boeing</i>
Erin Stuart	<i>NASA</i>	Ramona Gallerdo	<i>NASA ISS</i>
Frances Heinlen		Robyn Gateyn	<i>NASA</i>
Gene Mikluka	<i>Talking Space</i>	Rosa Banuelos	<i>Boeing</i>
Hanna Schneider	<i>NASA</i>	Stephen Stankevich	<i>Industry</i>
Imiman Mills	<i>NASA</i>	Sylvie Espinasse	<i>ESA</i>
Jamie Lentz	<i>Nasaspaceflight.com</i>	Tariq Malik	<i>Space.com</i>
Jamika Grandy	<i>Boeing</i>	Tina Green	<i>NASA</i>
Jeff Foust	<i>Space News</i>	Vanessa Bryant	<i>NASA</i>
Jannifer McCaghren	<i>NASA</i>	Veronika Fuhrmann	<i>ESA</i>
Jerry Webber	<i>Boeing</i>	Wanda Ferguson	
Jessica Carlton	<i>Boeing</i>	Zudayyah Taylor Dunn	<i>NASA</i>
Jim	<i>NASA</i>		
Jimi Russell	<i>NASA</i>		
Joan Higginbotham			
Joel Wallace	<i>NASA</i>		
Joey Roulette	<i>Reuters</i>		
John Frost			
John Mulholland	<i>Boeing</i>		
Jose Ramos	<i>GAO</i>		
Josh Finch	<i>NASA</i>		
Joy Kim			
Kameke Mitchell	<i>NASA</i>		
Kathalina McFarr	<i>JFAP</i>		

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