

National Aeronautics and Space Administration

International Space Station Advisory Committee

**April 24, 2025
NASA Headquarters
Washington, DC**

OPEN MEETING REPORT



Robert D. Cabana

Col. Robert D. Cabana, USMC (Ret.)
Chairman

Dennis McSweeney

Mr. Dennis McSweeney
Executive Director

NASA INTERNATIONAL SPACE STATION ADVISORY COMMITTEE

April 24, 2025
NASA Headquarters
Washington, DC

TABLE OF CONTENTS

Meeting Report:		Page 3-6
Attachment A:	Advisory Committee Membership	Page 7
Attachment B:	Meeting Attendees	Page 8

NASA INTERNATIONAL SPACE STATION ADVISORY COMMITTEE

MEETING REPORT

**April 24, 2025
NASA Headquarters
10:00 AM ET**

Mr. Dennis McSweeney, Executive Director of the NASA International Space Station Advisory Committee (ISSAC), called the meeting to order, welcomed the participants, called roll, and gave a brief overview of the purpose of the ISSAC closed fact-finding meeting with the Roscosmos Advisory Expert Council that was held in Houston, Texas, February 18-21, 2025.

Following rollcall, Mr. McSweeney turned the meeting over to Col. Robert Cabana, ISSAC Chair.

Chairman Robert Cabana:

From February 18 to 21, this Committee held a joint meeting at the Johnson Space Center in Houston with the Roscosmos Advisory Expert Council.

At this joint meeting in Houston, the two advisory committees – which are referred to as the Joint Commission when they meet together – held very productive discussions with representatives from NASA and Roscosmos, which led to a number of recommendations.

The Joint Commission began its meeting by reviewing the status of the NASA and Roscosmos responses to the recommendations that the Joint Commission had made at its previous meeting in Moscow in September 2024.

There were five recommendations from the September 2024 meeting:

The first recommendation was that NASA and Roscosmos continue assigning integrated crews.

NASA and Roscosmos confirmed that this recommendation is being implemented and that the two agencies continue to sign the necessary agreements to allow these integrated flights to continue.

The second recommendation was for NASA to provide integrated safety data for new visiting vehicles to all ISS partners for timely review.

NASA confirmed that preliminary information has been provided and final documentation is in work.

The third recommendation was for NASA and Roscosmos to continue to work in attaining a common understanding of the structural integrity of the PrK and incorporate outside experts from academia and/or industry to augment the level of expertise and emphasis on resolving the issue. The Joint Commission emphasized that reaching agreement on the root cause of the cracks in the PrK is in the best interest of the partnership.

NASA and Roscosmos confirmed that the analysis, inspection, and repair of the PrK is ongoing and involves the participation of both teams.

NASA and Roscosmos confirmed that they have brought on independent experts who are assisting in the investigation of the PrK cracks.

As a next step, a NASA technical team will travel to Moscow in May for a face-to-face meeting with Russian experts.

The fourth recommendation was for NASA and Roscosmos to agree that when the PrK hatch is open, the operations team should ensure that all emergency scenarios are considered to ensure the safety of the crew.

NASA and Roscosmos confirmed that the team has an agreed-to operations plan and that emergency procedures exist, and that crews are trained.

The fifth recommendation was that NASA and Roscosmos work together to maximize the amount of propellant on board the ISS to support a contingency deorbit.

NASA and Roscosmos confirmed that this recommendation is being implemented.

After reviewing the status of the recommendations from the September meeting, the Joint Commission received briefings from Roscosmos and NASA representatives on the following:

- U.S. and Russian ISS segments focusing on the sustainability and supportability of ISS with the current flight plan.
- A detailed update from both the U.S. and Russian Teams on Service Module Transfer Tunnel (PrK) leak investigation.
- An update on the Functional Cargo Block (FGB).
- Development of a deorbit strategy and the U.S Deorbit Vehicle (USDV).
- The Starliner Crew Flight Test and its impact on ISS operations.
- Human health and performance updates on recent discoveries made on ISS concerning crew health for long duration space flight missions such as future flights to the Moon and Mars.

The Joint Commission noted the importance of data continuity and capturing lessons learned during the ISS program to avoid gaps in critical information when the station transitions to end of life.

The Joint Commission noted that the success of future human space flight platforms and stations is dependent upon maintaining a continuous presence in low Earth orbit and ensuring utilization of the International Space Station through its lifetime to continue critical research, until a suitable follow-on capability is in place.

Human Research Program and Space Medicine experts presented scientific results from the valuable, joint international utilization of the ISS. Updates identified significant new medical risks to humans working in microgravity.

Additionally, there continues to be surprising results in basic, microbiological and materials sciences that demonstrate the need for more research and development of countermeasures for future space programs, as well as improving life on Earth.

For instance, micro-biological growth on ISS external surfaces has been observed. These microorganisms seem to be genetically identical to terrestrial organisms and are speculated to have been transported via the tiny amount of atmosphere hitting the space station. It is surprising that microorganisms would survive in the extremely harsh environment of space with the lack of atmosphere, while being exposed to intense solar and galactic radiation and wide swings in temperatures.

Knowledge gaps in both human biological research and fundamental science will require further study for the safety of future human space flights, including to the Moon and Mars. For example, eye and possibly brain changes have been observed in astronauts during long-duration spaceflight. The precise cause of these changes is not yet known; nor are there currently any available mitigations or treatment. We should expect to continue to find new observations as we continue to extend the limits of human exploration in space.

In its review of the ISS deorbit strategy, the Joint Commission noted the importance of key elements of a safe deorbit. An uncontrolled deorbit of ISS would result in very large pieces of debris (up to car and train size) along a track that spans continents, presenting a significantly high casualty risk to humans. The planned controlled deorbit with the USDV places all of the hazardous debris in an uninhabited region of the ocean, with extremely low casualty risk (about 1,000 times less).

Because USDV carries ascent and new vehicle risk, a backup deorbit using the Russian Segment and two Progresses will be carried as a contingency with an elevated casualty risk. The ISS deorbit process takes 2.5 years beginning with passive drift to lower altitudes and ends with re-entry.

The ISS propellant tanks do not currently have sufficient fuel quantities for this backup deorbit. The Joint Commission reviewed the plan to have the FGB and Service Module propellant tanks sufficiently filled by 2028.

The USDV delivery is planned for mid-2028. ISS altitude should not be substantially lowered until the USDV is docked to ISS and verified to be functional, and the backup Progress deorbit capability is available.

The Joint Commission agreed that to ensure public safety with a safe deorbit of the ISS, lowering of ISS altitude cannot start until 2028 when the critical capabilities are expected to be available. This results in an ISS re-entry no earlier than late 2030.

As a result of these briefings, the Joint Commission recommended that NASA and Roscosmos:

1. Continue to support face-to-face meetings of U.S. and Russian materials and structures experts to find a common understanding of the root cause of the PrK leaks.
2. After the root cause and impact of the PrK leaks are agreed upon, reevaluate the nominal and contingency operations procedures.
3. Accelerate research on the ISS, advancing understanding of microgravity effects on the human body, from cellular changes to physiologic systems, and developing safe countermeasures. It is critical to continue this uninterrupted joint international scientific and engineering work having a continuous human presence with no gap for human laboratories in low Earth orbit to enable success of future human missions to low Earth orbit, Moon and Mars.
4. Taking into consideration the deorbit requirements discussed, NASA and Roscosmos should provide an integrated deorbit decision timeline. This work should ensure safety milestones are met and a plan, identifying hardware readiness and critical capabilities, will be in place at the start of the ISS deorbit process.

The Joint Commission commended NASA, Roscosmos, and the other ISS international partners on their exceptional efforts in ensuring the continued safe and productive operation of the International Space Station, maximizing its value for scientific research, and paving the way for future human space exploration.

The Joint Commission agreed to meet again in July 2025.

Mr. Cabana confirmed with the Committee members that none of them had comments to the recommendations.

Mr. McSweeney adjourned the meeting.

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NASA Headquarters
Washington, DC
April 24, 2025

Advisory Committee Membership

Chairman

Col. Robert D. Cabana, USMC (Ret.)

Members

Capt. Frank Culbertson, USN (Ret.)

Charles Daniel, Ph.D.

Michael Greenfield, Ph.D.

Daniel Heimerdinger, Ph.D.

Ms. Ginger Kerrick

Ms. Harmony Myers

Maj. Gen. Josef Schmid, (USAFR), M.D.

Capt. William Shepherd, USN, (Ret.)

Ms. Nicole Stott

William Vantine, Ph.D.

Col. Mark Vande Hei, US Army (Ret.)

Technical Advisors

Col. Kevin Ford, USAF (Ret.)

Maj. Bob Maiberger, U.S. Army (Ret.)

Executive Director

Mr. Dennis McSweeney

Deputy Executive Director

Ms. Holly Stevens

NASA INTERNATIONAL SPACE STATION ADVISORY COMMITTEE MEETING

NASA Headquarters
Washington, DC
April 24, 2025

MEETING ATTENDEES

International Space Station Advisory Committee

Members

Robert D. Cabana, Chairman
William Vantine, Deputy Chairman
Frank Culbertson
Charles Daniel
Daniel Heimerdinger
Harmony Myers
Josef Schmid
Bill Shepherd
Mark Vande Hei

Executive Director

Dennis McSweeney

Deputy Executive Director

Holly Stevens

Technical Advisor

Robert Maiberger

NASA

Chad Birnbaum
Kenneth Bowersox
Julian Coltre
Richard Irving
Jamie Krauk
Mary Lawrence
Claire O'Shea
Youshay Rizvi
Jimi Russell

Others

Cassandra Ardern
Tatum Butler
Miles Doran
Sylvie Espinasse

Jeff Foust
Veronika Fuhrmann
Irene Klotz
Gene Mikulka

Michael Portman
Jose Ramos, Jr.
Marcia Smith
Ron Ticker