National Aeronautics and Space Administration

International Space Station Advisory Committee

November 13, 2024
NASA Headquarters
Washington, DC

OPEN MEETING REPORT

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

Mr. Dennis McSweeney
Executive Director

NASA INTERNATIONAL SPACE STATION ADVISORY COMMITTEE

November 13, 2024
NASA Headquarters
Washington, DC

TABLE OF CONTENTS

NASA INTERNATIONAL SPACE STATION ADVISORY COMMITTEE

MEETING REPORT

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10:00 AM ET

Mr. Dennis McSweeney, Executive Director of the NASA International Space Station (ISS) Advisory Committee, called the meeting to order, welcomed the participants, called roll, and gave a brief overview of the purpose of the fact-finding meeting held in Moscow, Russia:

Executive Director Dennis McSweeney: *On September 17 and 18, 2024, the International Space Station Advisory Committee met with the Roscosmos Advisory Expert Council as a Joint Commission and held a fact-finding session in Moscow, Russia, to review ISS operations, with a focus on crew safety.*

Mr. McSweeney then turned the meeting over to Col. Robert D. Cabana, USMC (Ret.) and Chairman of the NASA ISS Advisory Committee:

Chairman Robert Cabana: *Thank you, Dennis, and good morning, everyone.*

I want to welcome everyone to this first public meeting of the ISS Advisory Committee under my leadership. I'd also like to personally recognize two members of the committee who are no longer with us, who served our nation well over many years of dedicated service: Lieutenant General Tom Stafford, USAF (Ret.), the former chairman of this committee, and Major General Joe Engle, USAF (Ret.). They were two outstanding Americans and I thank them for what they did to establish this team. Additionally, I'd like to recognize two other members who have stepped down from the committee, who also played key roles in its success: Captain William Readdy, USN (Ret.) and Colonel Jim Adamson, U.S. Army (Ret.). Thank you, gentlemen, for your distinguished service.

I would also like to thank Mr. Bill Vantine, the original Executive Secretary of this committee, who has agreed to be the Deputy Chairman of the Committee.

Our primary emphasis today is to report on our fact-finding trip to Moscow in September and to provide a status of the issues that we see as important to the safety of the International Space Station and our recommendations to the NASA Administrator, Senator Bill Nelson, and the Director of the Russian Space Agency, Mr. Borisov.

In meeting with the Roscosmos Advisory Expert Council as a Joint Commission, with the Russian side chaired by my good friend and former crewmate Sergei Krikalev, both sides recognized the continued cooperation and good communication between the U.S. and Russian teams and the excellent working relationship resolving on-orbit issues.

The status of both the U.S. and Russian segments was reported by technical experts from both sides to the commission. Then, more detailed discussions were held on technical issues and concerns that impact the safety of the ISS.

One of the primary concerns reviewed was the status of the cracks in the PrK (where the Russian Soyuz and Progress vehicles dock on the x axis of the Service Module). The Joint Commission noted that although the teams continue to investigate causal factors of crack initiation and growth, the U.S. and Russian technical teams do not have a common understanding of the likely root cause, or severity of the consequences of these leaks. The Russian position is that the most probable cause of PrK cracks is high cyclic fatigue caused by micro vibrations. NASA believes PrK cracks are likely multi-causal, including pressure and mechanical stress, residual stress, material properties, and environmental exposure. The Russians believe that continued operations are safe, but they can't prove, to our satisfaction, that is the case; the US believes it is not safe, but we can't prove, to the Russian's satisfaction, that that is the case. While the Russian team continues to search for and seal leaks, it does not believe catastrophic disintegration of the PrK is realistic. NASA has expressed concerns about structural integrity of the PrK and the possibility of a catastrophic failure.

The Joint Commission discussed operational configuration of the ISS during PrK hatch open operations and the impact of these cracks and leaks.

Recommendation: NASA and Roscosmos shall 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 with emphasis on resolving the issue. The joint technical teams should agree on the root cause of the cracks in the PrK. This is an engineering problem and good engineers should be able to reach a solution and agree on it.

The ISS Program has already compiled an outside team of experts to take an independent look at the issue to help determine root cause and we are looking forward to the Russian side doing the same.

Until root cause and the impact of continued nominal operations with the cracks is determined, operational mitigations must be taken when the hatch between the PrK and the Service Module is open.

Recommendation: When the PrK hatch is open, the operations team should ensure all emergency scenarios are considered to ensure the safety of the crew.

The ISS Program and RSC-Energia also briefed the Joint Commission on the status of nominal and contingency deorbit concepts of operations. Due to external factors, uncertainty exists in the timeline for nominal ISS end of life and deorbit. Discussions included an overview of capabilities, limitations, and progress associated with establishing joint roles and responsibilities. Khrunichev also provided a comprehensive summary of the FGB status. The Joint Commission did not identify any major issues.

Recommendation: NASA and Roscosmos will work together to maximize the amount of propellant on board the ISS to support a contingency deorbit.

Additional recommendations made to Administrator Nelson and Director Borisov by the Joint Commission, resulting from our discussions included:

- *NASA and Roscosmos continue assigning integrated crews, with NASA providing EVA/robotics training for Russian cosmonauts. The safety of ISS depends on this.*

- *NASA shall provide integrated safety data for new visiting vehicles to all partners for timely review.*

In summary, the Joint Commission agreed it was an extremely successful meeting which benefited greatly from being face-to-face after having virtual meetings due to the pandemic and other reasons. It was agreed to meet again in the first quarter of 2025, in person, to evaluate the progress made on the recommendations and review the status of the ISS and any new issues that may exist.

That concludes a summary of our meeting with the Russian side, and I believe our recommendations are meaningful and can be acted on to improve the safety of the ISS. With that, I would ask my deputy, Bill Vantine, if he has anything to add.

Deputy Chairman William Vantine: *I think you summarized it very well. Thank you. And I believe we got wonderful cooperation from both sides and also from the Programs.*

Chairman Cabana: *Are there any comments from any of the committee members that they would like to add?*

There were no comments.

Chairman Cabana: *If there are no further comments, I turn it back over to you, Dennis, to close out the meeting. Thank you all for your attention and support of the safe and successful operation of the ISS.*

Exec. Director McSweeney: *Thanks again to the Committee for all the hard work on this assessment. This meeting is adjourned.*

Attachment A

NASA International Space Station Advisory Committee

NASA Headquarters
Washington, DC
November 13, 2024

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.
Shannon Walker, Ph.D.

Technical Advisors

Col. Kevin Ford, USAF (Ret.)
Maj. Bob Maiberger, U.S. Army (Ret.)

Executive Director

Mr. Dennis McSweeney

Dep. Executive Director

Ms. Holly Stevens

Attachment B

NASA International Space Station Advisory Committee Meeting

NASA Headquarters
Washington, DC
November 13, 2024

Meeting Attendees

NASA International Space Station Advisory Committee

Robert D. Cabana, Chairman
William Vantine, Deputy Chairman
Frank Culbertson
Michael Greenfield
Daniel Heimerdinger
Ginger Kerrick
Harmony Myers
Josef Schmid
Nicole Stott
William Vantine
Shannon Walker

Executive Director
Dennis McSweeney
Holly Stevens

Technical Advisors
Kevin Ford

NASA

Nathan Boll
Kenneth Bowersox
Dina Contella
Greg Dorth
Mary Lawrence
David Petterson
Jimi Russell

Others

Bill Beckman
Stephen Clark
Matthew DeRossier
Miles Doran
Jeff Foust
Erin Kennedy
Adrianne Lewis
Gene Mikulka
Jose Ramos, Jr.
James Rice
Will Robinson-Smith
Marcia Smith
Jana Stoudemire
Johnathan Watts
Sarah Whiteley