The National Academies of
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HEALTH AND MEDICINE DIVISION
Board on Health Sciences Policy
Board on Health Care Services

Committee on Assessment of Strategies for Managing Cancer Risks Associated with Radiation Exposure During Crewed Space Missions

PUBLIC WEBINAR
Wednesday, April 14, 2021
1:00pm – 2:30pm ET

Objective:

1. Committee and ICRP's Task Group 115 on Risk and Dose Assessment for Radiological Protection of Astronauts discussion of international space radiation dose-limits.

PUBLIC WEBINAR

1:00 p.m. **Convening Public Webinar and Welcome**
Hedvig "Hedi" Hricak, Memorial Sloan Kettering Cancer Center, Committee Chair
Gayle Woloschak, Northwestern University, Committee Member

1:05 p.m. **Overview of the ICRP's Task Group 115**
Motivation, Agenda, and Future Plans

Werner Rühm, Helmholtz Zentrum München, Germany, Task Group 115 Chair

1:20 p.m. **Overview of International Space Agencies Assessment of Dose and Risk for Astronauts**
Marco Durante, GSI Helmholtz Center, Germany, Task Group 115 Member

1:40 p.m. **Discussion with Committee and ICRP's Task Group 115 Members**
Gayle Woloschak, Northwestern University, Committee Member

ICRP Discussants include*:*

- *Chunsheng Li*, Health Canada, Canada; TG115 member
- *Ulrich Straube,* ESA, Germany; TG115 member
- *Vyacheslav Shursahkov*, RSA, Russian Federation; TG115 member
- *Leena Tomi*, CSA, Canada; TG115 member
- *Alexander Ulanowski*, IAEA, Austria; TG115 member
- *Jing Chen*, Health Canada, Canada
- *Chris Clement*, ICRP Scientific Secretary
- *Mikhail Dobynde,* Institute of Biomedical Problem, RAS
- *Samy El-Jaby*, Canadian Nuclear Laboratory, Canada
- *Mark Shavers*, ISMT, USA
- *Guangming Zhou*, Suzhou University, China

2:30 p.m. **Adjourn Open Session**

Discussion Questions on Different Space Radiation Heath Standards

- Please provide an overview of the main characteristics of the standards set by the different space agencies (other than NASA). The committee is particularly interested in the following information
  - When were these standards developed?
  - Is there a publicly available report that describes the standard?
  - Is the standard risk or dose-based and what is the dose or risk value? If risk-based, is it based on cancer risk or on other end points as well? Is it based on disease incidence or mortality?
  - What epidemiological health data are part of the risk model that the standard is based on? For example, A-bomb survivor data or other occupational studies?
  - Do the different space agencies have separate standards depending on sex, age, or other factors of crew members?
  - How do the other agencies model the risk? What terms are in their risk models?
  - How do the other agencies model the uncertainty in the risk? How large are their estimates of the uncertainties and what does their distribution look like?
  - Do the other agencies base their standard on the mean risk, the median risk, or some upper percentile of the estimated risk?
  - Are space agencies considering re-evaluating their standard and if yes, for what reasons?
  - How do the agencies deal with crew members who are likely to exceed the standard? For example, is there a waiver process and if yes, what is the threshold for requiring that waiver (in terms of exceeding dose or risk)?
- To the extent possible, please provide information on how the space agencies communicate risks from radiation to crew members.
  - How do the other agencies communicate the risk to their astronauts and how do they communicate the uncertainty in their risk estimates?
  - Do they typically provide both dose and risk estimates? In what format(s)?
  - Do they typically provide individual risk assessments? If yes, what factors (age, sex, other) goes in the risk assessments?
  - Do space agencies use genetics or other factors to assess and provide astronauts' personal risk from radiation? If yes, how are genetics or other factors used for risk assessment. If not, why?
  - How do space agencies typically communicate with astronauts about various assessments of risk from radiation?
  - How, if at all, do space agencies evaluate the effects/effectiveness of their radiation risk communications with astronauts?
  - Are any reports available from space agencies about the communication of risks to astronauts from radiation, or about how astronauts perceive their risks from radiation?

- In your view, what are some of the challenges with existing standards as space missions become of longer duration?
- In your view what are the reasons that are driving the need for harmonization of standards?
- Please provide any additional information that the committee did not ask but you think is relevant to this committee's task.

Task Group 115

- Please describe the task group scope, process, and timeline.
- What is driving the need to harmonize the dose and risk across space crew members from different agencies?