International Commission on Radiological Protection

Task Group 115: Risk and Dose Assessment for Radiological Protection of Astronauts

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Previous ICRP Activities

Aspects of radiological protection of astronauts in space have been addressed by ICRP in Publication 123 “Assessment of Radiation Exposure of Astronauts in Space”, published in 2013.

This publication focused on the challenges in dosimetry related to the radiation fields in space which differ from those on Earth. It covered

- the radiation environment in space,
- quantities used in radiological protection,
- methods of measurement,
- radiation fields inside spacecraft and on planetary surfaces,
- radiation fields and doses in the human body,
- and a short section on operational radiological protection.

Recent Developments

The various space agencies involved in human spaceflight use

- a variety of methods to assess dose and risk to their astronauts, and
- a variety of risk and dose protection quantities and restrictions.

In 2018, the following space agencies involved in the International Space Station proposed collaboration with ICRP

- Canadian Space Agency - CSA,
- European Space Agency - ESA,
- Federal Space Agency of the Russian Federation - FSA,
- Japan Aerospace Exploration Agency - JAXA,
- National Aeronautics and Space Administration – NASA.

This prompted ICRP to establish TG115 with input from international experts in radiation risk and dosimetry.

The Task Group was approved in May 2019 at the meeting of the Main Commission in Houston, USA.

Goals of Collaboration between ICRP and Space Agencies

- to examine effects which may impact crew health and mission success, and
- to develop a common health risk assessment framework and recommendations on exposure limits for exploration-class human spaceflight missions.

Scope of Task Group 115

The current Task Group will build on the work in Publication 123, to develop a comprehensive framework for dose and risk assessment for radiological protection of astronauts, which might also be of relevance for space tourism. This will include:

- a set of basic objectives,
- a review of the current understanding of effects and risks from space radiation,
- a broadly-applicable risk and dose assessment methodology (noting that dose assessment has already been addressed in Publication 123),
- an assessment of the use of risk as a radiological protection quantity.

Planned TG 115 Work as Discussed in July 2019

- Review of relevant literature,
- Characterization of radiation fields,
- Dose assessment methodologies,
- Relevant health effects + reviews (focus on space),
- Risk assessment methodologies,
- Sources of uncertainty,
- Set ranges of reasonable and tolerable dose/risk for space exploration (implementation into ICRP RP system).