IAA Study Group Status Report #11

Responsible Commission:

Commission 2

Study Number and Title:

2.12-Effectiveness of Countermeasures

Short Study Description (repeat from Study Group Proposal):

To collect and summarize evidence of effectiveness of physiological countermeasures for protection of human health in space and present a state of the art and needed forward work for future manned deep space exploration missions.

Progress in past six months (Meeting list)

A telecom meeting was held on 10-02-2018 in the Study Group and thereafter only bilateral meetings were held with individual members for completion of the document. The work progressed well, and the original scheduling plan was changed to finalize the document and have it export controlled by KBRwyle and NASA for submission to IAA on March 1st, 2019, before the IAA HQ spring meeting in Paris.

1. Forward Work: Evaluation and approval of the document as a deliverable to IAA.

2. Updated list of milestones (1 – 11):

   Milestone 1,
   February 2014:
   Establish a list of physiological countermeasures used in manned spaceflight programs divided up into short (<30 days) and long (>30 days) duration flights (A joint U. S./Russian publication in 5 volumes entitled “Space Biology and Medicine” edited by Nicogossian, Mohler, Gazenko and Grigoriev will be the basis of this work).

   Milestone 2,
   February 2014:
   Establish a method to score or evaluate the effectiveness of countermeasures based on previous U. S and Russian experience (2a) and score/evaluate previously used countermeasures based on milestone 1 (2b).

   Milestone 3,
   May, 2014:
Describe and evaluate countermeasures that have been tested during ground analog conditions, and which are not operational yet but have shown potentials for future use.

**Milestone 4.**
April 2015:
Describe and evaluate countermeasures that have been tested in a research setting in space, and which are not operational yet but have shown potentials for application.

**Milestone 5 - 6.**
April 2015:
Based on milestones 1 - 4, recommend the most efficient integrated countermeasure suite for investigation in space before the end of ISS and establish a vision for a future integrated human countermeasure suite during deep space exploration missions related to the most likely mission scenarios (e. g., divided into missions with or without planetary surface investigations and shorter or longer than 6 months and combinations thereof).

**Milestone 7.**
June 2015:
Describe the expected gaps of knowledge regarding countermeasure development from the end of ISS to the initiation of future deep space exploration missions

**Milestone 8.**
July 2015:
Discuss and describe the usefulness of artificial gravity for future deep space exploration missions and describe the advantages and disadvantages, and how use of artificial gravity during future exploration missions will influence the utilization of ISS.

**Milestone 9.**
July 30, 2015:
Presentation of Study Group work status at the International Countermeasures Working Group meeting in Prague.

**Milestone 10.**
July - December, 2015:
Draft report.

**Milestone 11.**
January 2016 – April 2017: Further iterations of report through bilateral interactions between Chairs/secretary and each agency representative for finalization before end of 2016.
Milestone 12,

Notes:

- Presentations on progress were delivered to IAA at their regular meetings when required.
- Each milestone was discussed and approved by the 2.12 Study Group at telecons closely related to the milestones, and for each telecon the secretary was responsible for presentation of a draft section of the report for discussion and comments.
- Inbetween milestones and telecons/meetings, email exchanges between IAA study group members on content of the document were conducted coordinated by the secretary as the basic working tool.

Website Study Information up to date? (Study Group Membership, Study Plan and Schedule):

Membership:

John B. Charles (NASA)
Inessa Kozlovskaya (IBMP)
Peter Norsk (BCM-NASA)
Jörn Rittweger (DLR)
Chiaki Mukai (JAXA)
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Patrik Sundblad
Natalie Hirsch (CSA)
Perry Johnson-Green (CSA)
Valerie Gil (CSA)
Hiroshi Ohshima (JAXA)
Nora Petersen (ESA)
Judith Hayes (NASA)
William H. Paloski (NASA)
Elena Fomina (IBMP)
Elena Tomilovskaya (IBMP)
Jonathan Scott (ESA-EAC)
Lena Norrbrand (Swedish Aerospace Physiology Centre)
Ronita Cromwell (USRA-NASA)
Yael Barr (Wyle-NASA)

Study Plan and Schedule: See above.
Next Meeting:
No further meetings planned.

Forward Work:
Awaiting IAA Commission 2 evaluation.

Issues requiring resolution? (Recommend approach):
None

Product Deliveries on Schedule? (If modified explain rationale):
Completion of the document was delayed, because further iterations were found necessary.

Study Team Member Changes? (List any Study Team Members that you wish to discontinue, and provide names plus contact coordinates of any Members you wish to add on the second page of this Study Update form.) Note: Complete contact information including email, tel. and fax must be provided for all additions. Only Members with complete contact information will be listed and receive formal appointment letters from the IAA Secretariat.)
None

Name of person providing Study Group Status (Study Group Chair or Co-Chair):
Study update:
   Peter Norsk, M. D., dr. med., Secretary (NASA)

Chairs:
   John Charles (NASA)
   Inessa Kozlovskaya (IBMP)

Status Report Date:
03/01/2019

Study Team Membership Changes:
None

Effective Date:
03/01/2019
IAA study group 2.12 - Effectiveness of Countermeasures

List of participants

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