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IBPP Research Associates: Space and Extreme Environments

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Per M. Ephimia Morphew. President of the Society for Human Performance in Extreme Environments at http://www.hpee.org, colleagues at the Institute of Biomedical Problems in Russia (IBMP) are engaged in an isolation experiment that is two months underway and preliminary findings are reported below. (Slightly edited by IBPP).

First Two Months of Simulated Isolation Passed

Experiment with 8-months isolation, SFINCSS-99, devoted to the simulation of International Space Station's flight started July 2-nd 1999. Crew 1, consisting of 4 subjects--including 2 members of Russian astronaut team--will spend 240 days in isolation. Isolation of Crew 2--also consisting of 4 subjects--began 3 weeks later and will last for 110 days. The complex scientific protocol of SFINCSS-99 includes 89 scientific experiments from Russia, Japan, US, Canada, and the European Community. As some preliminary results of the 2-months stay in hermetic chambers of Crew 1 and 40 days of Crew 2:

Crews completed 98% of the planned scientific protocol. The last 2% were not executed due to some problems with scientific equipment and software. Crews regarded as most remarkable experiments with joint group discussions. Crew 1 is also very much interested in growing plants in their chamber's green house.

As the Mission vividly demonstrated, some kinds of scientific equipment don't correspond to the reliability requirements for the space hardware and need additional improvement.

A lot of computers that are connected in the local network are used in SFINCSS-99. There were some breakdowns in the network functioning, mainly due to weather. But the crew members successfully coped with all the problems and repaired the network.

The simulator's service systems maintained environmental parameters in the chambers (temperature, pressure, humidity, etc.) according to Mir space station standards.

The state of health of the crews is regarded by medical authorities as good, without any unfavorable changes.

During the first 2 weeks of isolation, each crew spent time adapting to the confinement conditions and establishing a relationship with Mission Control. During this period both crews experienced a time deficit and complained about fatigue. But as far as adapting to the experimental Conditions, there are no more complaints about the work schedule and both crews manage to fulfil the daily schedule in time.

Interaction of the crews with Mission Control and among each other is good. But Crews are not communicating with each other as intensively, as we expected.

At the end of July, the 40th birthday of a Crew 1 member was celebrated. A psychological support group arranged a telecommunication session with his family and friends. Both crews celebrated this day during the joint dinner with singing.

Crews compensate for an informational deficit using E-mail and Internet. They also have 20 minutes each week for telephone communication.

IBPP Commentary. As opposed to traditional human factors Issues, more research needs to be carried out on the political psychological parameters of space. Topics should include power relations, ideology-behavioral consistency, political security Issues, political morality, and the study of all political subjects in the environment of space. These parameters can have as much or more effect on task performance than what has usually been studied in the ergonomics and human factors literature. (Keywords: Isolation, Society for Human Performance in Extreme Environments, Space Research)