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FEATURES OF COMMUNICATION OF A CREW OF MIXED NATIONAL AND GENDER  
COMPOSITION WITH THE CONTROL CENTER UNDER COMMUNICATION DELAY IN  
SIRIUS-18/19

**Abstract**

Studying the communication between cosmonauts and Mission Control Center is a standard procedure for the psychological monitoring of Russian space crews, allowing to assess the psycho-emotional state of crew members, as well as the effectiveness of their interaction with the MCC. Studying the dynamics of communication allows us to evaluate the processes of adaptation of crew members to the adverse factors of space flight (Gushin, 2003). In SIRIUS-19 120-day isolation experiment, we studied the features of communication between the crew of 6 subjects with mixed national and gender composition and the Control Center. The methodology of content analysis was similar to the previously described methodology used in the space experiment "Content" (Yusupova et al, 2019). It involves counting the statements reflecting coping strategies used by the subjects to resolve problems arising during isolation, made by the group of independent experts. In addition, methods of acoustic analysis of crew communication were used, as well as automated analysis of facial expressions during video contacts with the MCC. It was detected that during isolation there was a progressive decrease in the number of the crew-MCC communication sessions, their duration, as well as in the number and variety of statements within the studied categories. For instance, the number of statements about arising problems, as well as crew's requests decreased by several times in the second half of isolation compared to the first month. We suppose that, gradually adapting to the experimental conditions (including communication delay), the crew became significantly independent. They needed less recommendations and clarifications from the MCC, which reflects the crew's autonomy in conditions simulating interplanetary flight. These results confirm the communication patterns, previously identified in simulated study with high autonomy MARS-500 (Ushakov et al, 2014). We also found the influence of gender in crew communication patterns, which manifested despite the crewmembers' individual differences. At the beginning of the isolation the female part of the crew was more emotional in contacts with the MCC than males. However, as the crew adapted

to the experimental conditions, these differences between gender subgroups were mostly smoothed out. Emotional expressiveness of communication with MCC decreased in women, and the proportion of negative emotions increased in men. Thus, using complex analysis of crew communication in the relatively short isolation experiment, we were able to confirm the presence of specific changes in the crewmembers' psycho-emotional state characteristics associated with the crew autonomization, previously revealed in 520-day experiment MARS-500.