

IAF/IAA SPACE LIFE SCIENCES SYMPOSIUM (A1)
Behaviour, Performance and Psychosocial Issues in Space (1)

Author: Ms. Natalya Supolkina
IBMP, Russian Federation

Dr. Angelina Chekalina
Institute of Biomedical Problems, Russian Academy of Sciences, Russian Federation

Dr. Vadim Gushin
Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

Dr. Dmitry Shved
Institute of Biomedical Problems (IBMP), Russian Academy of Sciences (RAS), Russian Federation

Dr. Anna Yusupova
Institute for Biomedical Problems, Russian Federation

Prof. Elena Fomina
State Scientific Center of Russian Federation, Institute of Biomedical Problems, Russian Academy of Sciences, Russian Federation

COMPARISON OF THE CREW-MCC COMMUNICATION PARAMETERS DURING ROUTINE AND
STRESSFUL DAYS

Abstract

The main method of inflight psychological monitoring in Russia is based on the expert assessments of cosmonauts' routine communications with Mission Control Center. It allows to identify negative psychological and psychiatric phenomena (signs of fatigue, etc.) in speech and to assess the level of stress as well as coping strategies by the crew. We developed a system of categories for the crew communication content analysis. The main group of categories describes stress coping strategies (Lazarus and Folkman) and the second one describes speech behavior of a person during routine performance inflight (e.g., "time", "informing", "claims", "humor", etc.) In this study, we compared our data with the psychiatric monitoring reports data provided by the Mission control work-rest regime specialists. We divided the flight days into 2 categories: routine (calm, without incidents) and problem (stressful) ones. Workload on problem days was mainly associated with complicated continuous works (for example, EVA), as well as with accidents, unexpected equipment breakdowns/ It might have been accompanied by work-rest regime changes - less sleep, no time for lunch, workload during nighttime or weekends. According to our hypothesis, such working conditions induce more psychoemotional stress than routine working conditions, and this stress may manifest itself in cosmonauts' communications with Mission control. Comparing content analysis categories used on routine and problem days, we identified signs of psycho-emotional stress in cosmonauts' speech behavior. We used Mann-Whitney criterion for statistical analysis of crew communication content analysis data for the period of 2015-2016. The statistical analysis showed that on problem days (compared with routine days), there was a more frequent occurrence of statements related to such categories as "negative emotions" ($U = 21253$; $p = 0.000$), "request / demand" ($U = 20192$; $p = 0.000$), "planning" ($U = 18105$; $p = 0.000$), "cognitive load" ($U = 17819$; $p = 0.000$), "time" ($U = 17244.5$; $p = 0.000$), "effort" ($U = 16702$; $p = 0.000$), "trust" ($U = 23869$; $p = 0.000$), "initiative" ($U = 19120.5$; $p = 0.000$), "humor" ($U = 22228.5$; $p = 0.004$), "accident / breakdown" ($U = 22377$; $p = 0.01$), "searches" ($U = 21662$; $p = 0.004$), "problem" ($U = 14059.5$; $p = 0.000$), "claim" ($U = 13307.5$; $p = 0.000$), "confrontation" ($U = 18932.5$; $p = 0.000$). On problem days, when the cosmonauts could not exchange information with the

MCC specialists in an effective way, “complaint” statements in cosmonauts’ speech also appeared more often.