CRITICAL TEAM COGNITIVE PROCESSES FOR LONG–DURATION EXPLORATION MISSIONS

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BACKGROUND

Teams conducting long-duration spaceflight missions face the pervasive risk of team performance decrements due to inadequate cooperation, coordination, communication, and psychosocial adaptation within the spaceflight crew itself, as well as between and across Mission Control teams. Future space exploration missions will be characterized by extended periods of isolation and confinement as well as communication constraints caused by the extreme distances involved. Accordingly, these teams will need to operate under a much greater level of autonomy than current spaceflight crews. Given that team cognition has been shown to be a significant predictor of team performance across a number of domains and tasks [1], it is critical to understand how team cognition occurs under these specific conditions [2], how it shifts over time, and how to implement countermeasures to improve team-level cognitive processes such as planning, decision-making, and collaborative problem solving. These team processes have generally been well studied; however, research into team processes under conditions of isolation, confinement, danger, high autonomy, and long durations is limited [e.g., 3].

PROJECT SUMMARY

In an effort to support the need for further understanding of the issues surrounding team cognition for future space exploration missions, this project is taking a multidisciplinary perspective, coupled with operational assessments to identify the key team cognition factors that are most likely to affect the maintenance of effective and adaptive team performance and overall, crew well-being. We address the research that has studied team cognition in long-duration spaceflight missions and appropriate spaceflight analogues [cf. 4] while recognizing that little research has been conducted on team cognition in this context. As such, we evaluate issues related to, or supporting, team cognitive processes, and current methods used to address these in other relevant domains (e.g., nuclear power, organizational settings). Results from our literature review and operational assessment are presented as initial operational recommendations for training, selection, composition, and monitoring as well as suggestions for future research.

REFERENCES