Accidents and incidents show that high workload-induced stress and poor teamwork skills lead to performance decrements and errors. Research on teamwork shows that effective teams are able to adapt to stressful situations, and to reduce workload by using successful strategies for communication and decision making, and through dynamic redistribution of tasks among team members. Furthermore, superior teams are able to recognize signs and symptoms of workload-induced stress early, and to adapt their coordination and communication strategies to the high workload, or stress conditions.

Mission Control Center (MCC) teams often face demanding situations in which they must operate as an effective team to solve problems with crew and vehicle during on-orbit operations. To be successful as a team, flight controllers (FCers) must learn effective teamwork strategies. Such strategies are the focus of Space Flight Resource Management (SFRM) training.

SFRM training in MOD has been structured to include some classroom presentations of basic concepts and case studies, with the assumption that skill development happens in mission simulation. Integrated mission simulations do provide excellent opportunities for FCers to practice teamwork, but also require extensive technical knowledge of vehicle systems, mission operations, and crew actions. Such technical knowledge requires lengthy training. When SFRM training is relegated to integrated simulations, FCers can only practice SFRM after they have already mastered the technical knowledge necessary for these simulations. Given the centrality of teamwork to the success of MCC, holding SFRM training till late in the flow is inefficient. But to be able to train SFRM earlier in the flow, the training cannot rely on extensive mission-specific technical knowledge. Hence, the need for a generic SFRM training framework that would allow FCers to develop basic teamwork skills which are mission relevant, but without the required mission knowledge.

Work on SFRM training has been conducted in collaboration with the Expedition Vehicle Division at the Mission Operations Directorate (MOD) and with United Space Alliance (USA) which provides training to Flight Controllers. The space flight resource management training work is part of the Human Factors in Training Directed Research Project (DRP) of the Space Human Factors Engineering (SHFE) Project under the Space Human Factors and Habitability (SHFH) Element of the Human Research Program (HRP). Human factors researchers at the Ames Research Center have been investigating team work and distributed decision making processes to develop a generic SFRM training framework for flight controllers. The work proposed for FY10 continues to build on this strong collaboration with MOD and the USA Training Group as well as previous research in relevant domains such as aviation.

In FY10, the work focuses on documenting and analyzing problem solving strategies and decision making processes used in MCC by experienced FCers.