

SPACE OPERATIONS SYMPOSIUM (B6)  
Training Relevant for Operations, including Human Spaceflight (3)

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FLIGHT CONTROLLER TRAINING FOR ISS "KIBO" MODULE

**Abstract**

The Japanese Experiment Module "KIBO" is operated as part of the International Space Station (ISS) by ground personnel called JFCT (JEM Flight Control Team) at Tsukuba, Japan. We began a full-scale training for JFCT in 2005 and we have trained nearly 80 flight controllers so far. It was the first attempt toward the human space flight operation in Japan. We developed a training program for JFCT at the start of its training and have been continuously improving it with our own approach alongside the establishment of training techniques.

The ISS is operated with a cooperation of crewmember on orbit and ground control centers which spread out over different countries. Therefore, the key success factors for KIBO operation are in effectively communicating/coordinating with crew and international partners in other control centers as a team while maintaining a good situational awareness and making timely decisions when needed with explicit technical background. As for the 1st generation of flight controllers which currently play primary roles in KIBO operation, we emphasized on a simulation training which exercises the handling of nominal and off-nominal situations in a simulated flight-like environment. We have conducted more than 200 simulations so far including an integrated training with crewmember and a joint training with international partners. Issues in JFCT performance not resolved by repeating simulations were also revealed through the simulations. Thus, we developed and provided additional training specialized in building up basic skills and strengthening the weak points found out during simulations as countermeasures. Although very challenging, we have worked with JFCT members so that they acquire and effectively use the necessary skills through these training.

As we approach the completion of KIBO assembly, the operation of it moves into a steady state operations phase. Since it also follows the operation with reduced number of flight controllers, we need to consider how to make the most of fewer resources function synergistically as a team to reinforce more effective coordination and communication. To achieve these objectives, it is important to maintain the motivation of flight controllers and provide periodic training to them by effectively incorporating the lessons learned from the past training and real time KIBO operation.

This paper summarizes the flight controller training we have accomplished so far as JFCT training team and also reports some of our new efforts and an outlook for the KIBO steady operations phase and beyond.