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

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THE NEW APPROACH FOR ROBOTICS TRAINING

Abstract

Japanese Experiment Module Remote Manipulator System (JEMRMS) Training team has developed and provided the JEMRMS increment specific Training for ISS Expedition Crewmembers from Expedition 17. Since the last JEMRMS training at Tsukuba Space Center is scheduled in 4 to 6 months before their launch, maintaining the operational skill that they have learned is the key for safe and smooth robotics operation. For resolving this issue, we developed an Onboard Training (OBT) and started delivering OBT. Robotics Onboard Trainer (ROBoT), which was originally developed by NASA for Space Station Remote Manipulator System is the trainer for this training. Especially, for the crewmembers who have stayed onboard for a long time, the exercise of H-II Transfer Vehicle (HTV) Exposed Pallet handling and JEM Exposed Facility payload berthing for the purpose of recalling their JEMRMS operational skill. Also JEMRMS Small Fine Arm installation to the SFA Storage Equipment was conducted by using ROBoT, Training Material, and procedures. By adding Q A session after OBT, it has been successfully done up to now.

We decided to implement OBT according to the following concerns. - Crewmembers have to use the special coordinate frame to fly the arm as required. - Monitoring the close clearance to ensure the safety by using the exposed cameras was very critical. However, we recognized that requesting a lot of different types of OBTs, such as Emergency, robotics operation and a lot of unique science experiments.

Therefore, for reducing the Robotics OBT, we improved our training objectives for OBT by listing up the 1. Possible mistakes such as wrong hand-controller operation 2. Confusing operation from safety point of view 3. Forgettable 'must not do' operation by observing the students in our class room. And we attempted to stress crewmembers by providing the intentionally loaded training about the above three points. With this trial, we observed some students maintaining their skills better than providing students with normal training. This study and trial are going to be applied to the future manned mission to the moon because providing OBT is very difficult for a further long-duration expedition, because of the different environment or condition such as the delay of voice communication between the moon and the earth.