

SPACE OPERATIONS SYMPOSIUM (B6)
Training Relevant for Operations (3)

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FROM TRAINING TO REAL MISSION: SIMULATIONS SUPPORT DURING ATV OPERATIONS

Abstract

The importance of Simulations in the Training for Operations is widely recognised by the spacecraft operations community as a means to improve and evaluate the skills and the reactivity of the operators to conduct operations. This is shown both by the efforts put into the development of Simulators more and more accurately reproducing the real mission, and the time spent in Simulation exercises to prepare Operators before flight. Nevertheless there may be cases, especially when dealing with complex spacecraft, where the use of Simulations during the preparation of a mission may not be enough to cover all possible contingency situations that might be faced during the mission itself. The reactivity of a control centre to recover also from such contingencies is crucial for the achievement of the mission objectives. This is even more vital in Human Spaceflights where safety is also at stake and represents a major constraint for mission decisions. This is the case for the Automated Transfer Vehicle (ATV), the ESA vessel used for the resupply of the International Space Station (ISS), where, in order to improve the reactivity of the Control Centre (ATV-CC) to face unpredicted contingency situations, Simulations support is also employed during the critical phases of the Mission Operations, providing a bridge between Training and Operations support. Simulations support during ATV Operations is achieved in three different ways: 1- Providing in advance a portfolio of simulated mission scenarios and failures ready for use, likely to be the base to reproduce possible mission contingencies. This guarantees a timely readiness, but may not perfectly suit the specific occurrences of the real mission. 2- Preparing simulated mission scenarios and failures on the spot, on demand during the mission to reproduce the specific contingency experienced on the spacecraft. This approach aims at providing a scenario very close to the desired one, but its preparation may be more time consuming. 3- The third method represents a trade-off of the first two and consists in reproducing the ATV Mission in almost real time on the ATV simulator such to be able to provide simulated scenarios as close as possible to the real life, all the time and in a timely fashion, to improve accuracy and reactivity for ATV-CC in response to contingency situations. Many activities and deep coordination are needed between ATV-CC training and operational entities to efficiently implement this third approach, whose description is the scope of the present Paper.