

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

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TRAINING CONCEPT OF THE COLUMBUS FLIGHT CONTROL TEAM

**Abstract**

The European science module Columbus was attached to the International Space Station in Febr 2008. The installation was the major purpose of the STS-122 flight of the Atlantis Space Shuttle (1E) and marks the transition of the Columbus Control Center, located on the DLR premises in Oberpfaffenhofen/Germany, into its operational phase.

While the activities prior to 1E were mainly focused on the preparation of the shuttle, the generation of the required products and the certification of the new control team, the orientation had to slightly be shifted afterwards. After a transition phase, during which Columbus was commissioned and checked out, the steady state operations phase was entered.

Beside the steady state operations of the Columbus platform subsystems (e.g. water refill, anomaly trouble shooting ...) the utilization of Columbus started and science related activities became major components of day-to-day operations. The flight control team was now facing a completely new situation in various areas. The increment based preparation schedule required new processes and new structures within the teams to cope with the challenge to run day-to-day operations in parallel with preparatory tasks. The steady state operations phase unveiled deficiencies in process definition and documentation, which turned out to be invaluable for smooth collaboration of all involved entities. The 24/7 shift work required new concepts of information exchange within the flight control team, fluctuations in the personnel were inevitable and had to be compensated and kept at a minimum level. The training concept had to be changed to make sure that the expertise which was built up during the years of ops preparation was kept within the team. In addition the documentation of this knowledge was identified as a key element. Also on the tool side several improvements could be implemented and innovative concepts for the future were developed.

This paper discusses the most important lessons learnt after more than three years of Columbus operations. It explains in more details the improvements already implemented at the Columbus Control Center and gives an overview of future ideas and plans.