

Paper Title: The Right Stuff: A Look Back at Three Decades of Flight Controller Training for Space Shuttle Mission Operations

Synopsis:

This paper will summarize the thirty-year history of Space Shuttle operations from the perspective of training in NASA Johnson Space Center's Mission Control Center. It will focus on training and development of flight controllers and instructors, and how training practices have evolved over the years as flight experience was gained, new technologies developed, and programmatic needs changed.

Abstract:

Operations of human spaceflight systems is extremely complex, therefore the training and certification of operations personnel is a critical piece of ensuring mission success. Mission Control Center (MCC-H), at the Lyndon B. Johnson Space Center, in Houston, Texas manages mission operations for the Space Shuttle Program, including the training and certification of the astronauts and flight control teams. This paper will give an overview of a flight control team's makeup and responsibilities during a flight, and details on how those teams are trained and certified. The training methodology for developing flight controllers has evolved significantly over the last thirty years, while the core goals and competencies have remained the same. In addition, the facilities and tools used in the control center have evolved. These changes have been driven by many factors including lessons learned, technology, shuttle accidents, shifts in risk posture, and generational differences. Flight controllers will share their experiences in training and operating the Space Shuttle throughout the Program's history. A primary method used for training Space Shuttle flight control teams is by running mission simulations of the orbit, ascent, and entry phases, to truly "train like you fly." The reader will learn what it is like to perform a simulation as a shuttle flight controller. Finally, the paper will reflect on the lessons learned in training for the shuttle program, and how those could be applied to future human spaceflight endeavors. These endeavors could range from going to the moon or to Mars. The lessons learned from operating the space shuttle for over thirty years will help the space industry build the next human transport space vehicle and inspire the next generation of space explorers.