

2011

**NASA Range Safety
Annual Report**

C. Johnson Space Center

1. Space Shuttle

As the Space Shuttle Program was expected to end in 2010, the Space Shuttle Range Safety Panel wrapped up almost all “new business” during that year. The only carryover from 2010 was the actual implementation of the new U.S. Air Force Launch Collision Avoidance (COLA) screening process, which the accomplished without incident during STS-133. There were no substantial range safety anomalies or incidents during any of the final three Shuttle flights in 2011. The Space Shuttle Program formally disestablished the Space Shuttle Range Safety Panel at “wheels stop” of STS-135, the 135th and last Space Shuttle mission.



FIGURE 17: STS-133 SPACE SHUTTLE LAUNCH

2. Morpheus

The Morpheus Project provides an integrated vertical test bed (VTB) platform for advancing multiple subsystem technologies. Morpheus (Figure 18) is designed to integrate and demonstrate two key technologies. The first is a liquid oxygen (LOX) / liquid methane propulsion system, and the second technology is autonomous landing and hazard avoidance. Although initial plans included free flight tests in 2010, only hot fire and tethered tests were conducted. The Range Safety plan is in work but has not been approved.



FIGURE 18: MORPHEUS TESTING

3. Multi-Purpose Crew Vehicle (MPCV) Exploration Flight Test 1 (EFT-1)

JSC provided range safety expertise to EFT-1 as the flight test team continued range safety work in 2011. JSC Range Safety personnel participated in the introduction with the Range and review of AFSPCMAN 91-710 tailoring. Additionally, FAA requirements were explored to provide an initial understanding of the required products. JSC Range Safety personnel also supported the regular EFT-1 safety meetings and provided expertise on trajectory analysis methodology. Recommendations were provided on debris catalog development and a peer review was conducted of the FTS determination analysis.

4. Human Exploration Range Safety Panel (HERSP)

With the emergence of the new NASA program structure for human exploration, a new range safety panel was established called the Human Exploration Range Safety Panel (HERSP). The HERSP is co-chaired by NASA and the Air Force 45th Space Wing. The HERSP will provide functions including approval authority for Range Safety System (RSS) products, independent review of the Flight Termination System (FTS) to ensure public safety during launch, and communicating with the NASA programs regarding the Range Safety System (RSS). The HERSP will work technical issues through its three associated working groups: Flight Analysis, Vehicle Flight Safety System (FSS), and KSC Ground Ops. An initial organizational HERSP was held in the fall 2011, with plans for more regular meetings in 2012.