

Orbital Sciences Corporation has been contracted to design, build, test, and deliver on-orbit a Geostationary Communication and Control Segment (GCCS) payload. The GCCS payload is a part of the Wide Area Augmentation System (WAAS) for the US Air traffic control. GCCS replaces the current VHF Omni-directional Range (VOR) system for routing aircraft between airports and allows for instrument landing of aircraft at 4000+ airports. Currently, aircraft use GPS navigation receivers to determine position and attitude which result in a nominal GPS accuracy of ~ 15 meters. Errors due to clock synchronization, satellite orbit knowledge, atmospheric distortion effects, multipath, etc are all part of the ~ 15 meter accuracy. GCCS broadcasts correction information to a geosynchronous satellite which then rebroadcasts corrected information to aircraft. Accuracy after the GCCS correction results in errors of ~1-3 meters which allows for precision approach. The GCCS payload will also be used as a ranging channel to further characterize atmospheric effects. The GCCS payload uses a C-Band uplink of 6639.27 MHz and 6690.42 MHz and an L1 and L5 downlink of 1575.42 MHz and 1176.45 MHz respectively.

Currently, Orbital Sciences Corporation is in the final phases of building and testing the satellite that contains both GCCS and C-Band payloads. One of the final test phases is the satellite self-compatibility test that is performed in Orbital's near field range. The self-compatibility test will power up both the C-Band and GCCS payloads in a nominal operational configuration and look for adverse spacecraft interactions. Instead of a rebroadcast of the GPS L1 and L5 actual data, Orbital intends to use a CW carrier at the L1 and L5 center frequency instead. The near field range anechoic absorber material will absorb nearly all of the transmitted energy. The metal building that the near field range is enclosed in will also provide shielding to eliminate stray radiation from the Orbital facility. Testing of the GCCS system in the near field range will need to be performed for a 12 –16 hour period sometime between June 1 and Aug 1. Currently our schedule shows that this test will need to be performed during the second week of June to maintain a current launch scheduled for early August.