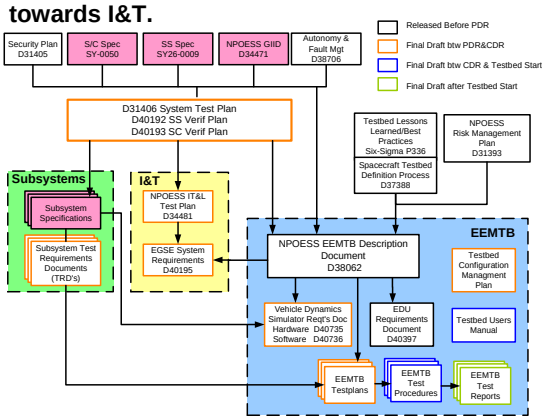
NPOESS Spacecraft - EEMTB

www.npoess.noaa.gov

Electrical Engineering Model Test Bed

The Electrical Engineering Model Test Bed (EEMTB) is an integral part of the Spacecraft and Space Segment Verification Plan, Flight Software Validation Plan, and a risk reduction tool to minimize the Integration and Test (I&T) schedule. The EEMTB is electrically equivalent to the satellite avionics, sensor interfaces and processing. The EEMTB will provide high-fidelity simulations of an on-orbit NPOESS satellite configurable to any of the three payload sensor suites (C1, C2, C3) in an effort to reduce risk as the program moves towards I&T.



EEMTB Retires Significant Risk Early, and Reduces I&T Costs

Subsystem
- Performance Verification by Analysis, Simulation, Breadboard Bench Test, or Acceptance test
- Unit/Module level EMI/EMC Tests
- Unit/Module Environmental Tests
- Workmanship Checkout
- Algorithm & Software Verification

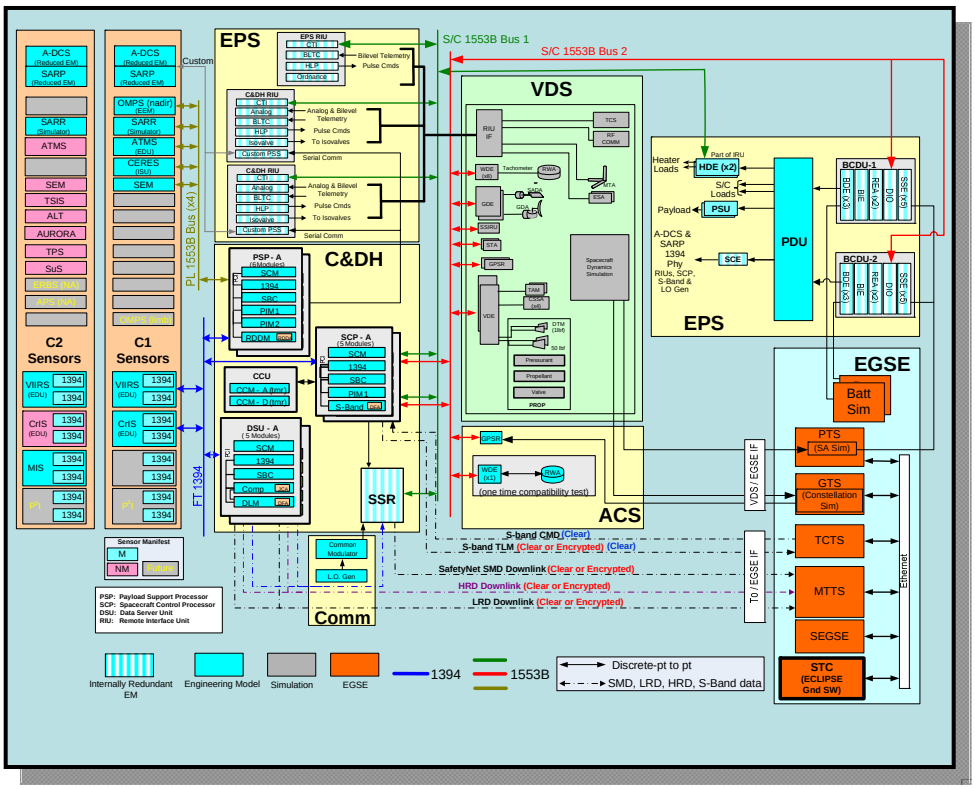
EEMTB
- Subsystem and System Level Functional Verification by Demonstration
- Flight Software Validation
- Risk Reduction Testing to I&T
- Fault Management Testing
- Database Verification
- Payload EDU Checkout

I&T
- System Level Workmanship and End to End Compatibility by Demonstration and Test
- System Level Acceptance Tests
- Satellite Environmental Testing
- Fault Management Regression Testing
- Satellite EMI/EMC Testing
- Mechanical Alignment

Risk
- Unit/Module Design
- Performance
- Workmanship
- Subsystem/System Interface
- Functional Verification
- Algorithms
- I&T Test Procedures
- System Level Workmanship
- System Level Environments
- Mechanical Integration

The approach and methodology for the Electrical Engineering Model Test Bed (EEMTB) takes into account lessons learned from EOS Aqua and Aura satellite systems, verifying interface compatibility between sensors and other satellite electrical components early in the program

EEMTB Architecture Block Diagram



EEMTB

- The EEMTB is a facility for flight software validation, subsystem test, and I&T checkout of procedures and test sets.
- The EEMTB used to simulate faults- not possible on safe to simulate on flight hardware.
- The EEMTB is the fully redundant electrical equivalent of the spacecraft avionics, sensor interfaces, and processing
- Uses selected engineering models or breadboards, flight like harness and sensor EDUs.
- It provides high fidelity hardware-in-the-loop, real time, closed loop simulations of the NPOESS satellite.
- Uses a subset of the Electrical Ground Support Equipment and ground software for telemetry and command used for SS level testing.
- Open loop tests will be run on the EEMTB to check out AI&T automatic test procedures (ATS) and integration procedures.
- The EEMTB will be maintained throughout the life of the Program as a real-time troubleshooting tool to investigate on-orbit anomalies.

Rev. 070108