



ACAST Workshop 2005

Space Based Technologies Project Chief Engineer

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Chief Engineer Review



- **Chief Engineer Overview**
 - Goals
 - Tasks
 - FY05 Accomplishments
 - FY06 Activities
- **ACAST Test and Demo Requirements Study**

Chris Wargo, CNS Inc.
- **Advanced Radio Guidance System**

Ed Heinzerling, ARGUS Avionics
- **Enhanced ADS-B Datalink Technology**

Ken Samuelson, Sensis Corp.
- **Advanced Wireless Communications Research**

Dana Hall, Sensis Corp.



Chief Engineer Overview

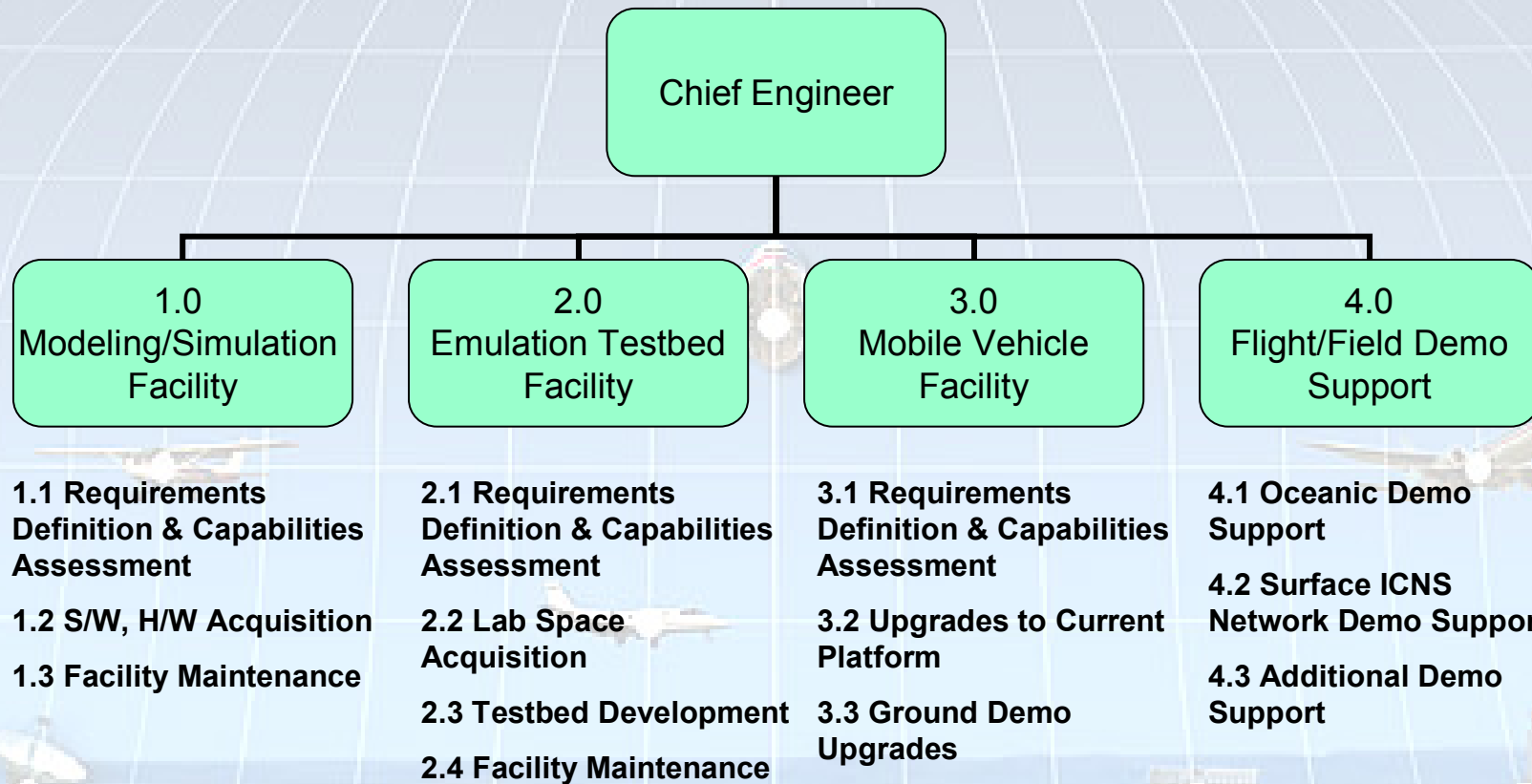
- **Role:**

- Provide a Modeling and Simulation / Test and Demonstration environment that supports the requirements of the SBT project
 - > Provide necessary facilities and toolsets
 - Software, Lab Space, Test Equipment
 - > Ensure coordination across technical subprojects
 - > Provide technology oversight
- Establish a CNS Test Bed Facility that serves as a resource for SBT project, GRC and others

- **Approach:**

- Evaluate use of new or external simulation tools
- Develop CNS emulation capabilities
- Partner with appropriate existing test and demo facilities
- Designate CE team members across each subproject

Tasks





FY05 Accomplishments



- **Initiated and Completed SBT Test and Demonstration Requirements Study**

- Subcontract with CNS Inc. and ViaSat Corp.
 - > Requirements assessment and systems engineering design study for the development of a CNS Test and Demonstration Facility (TDF)
 - > Survey of government and academia facilities

- **RFI conducted a survey of “Aeronautical MCNA CNS Modeling, Simulation and Demonstration Capabilities”**

- 10 responses from industry
- Results integrated into MCNA Simulation, Emulation and Demonstration roadmap plan





CNS Emulation Testbed Facility



- **Attributes:**

- Emulation of end-to-end system effects using real world NAS scenario and CNS equipage
- Able to generate CNS communication traffic loads and measure performance (throughput, latency, etc.)
- Must include complex RF environment, include interference, mixed usage transition, etc.
- Support Man-in-the-loop, and hardware interfaces

- **Leverage Prior Investments:**

- NASA Airspace Systems Program:
 - > ACES - Airspace Concept Evaluation System (VAMS Project)
 - > FASTE-CNS - Future Aeronautical Subnetwork Traffic Emulator for CNS (VAMS)
 - > VAC - Virtual Aircraft and Controller Communications Test System (AATT Project)
- DoD:
 - > JCS - Joint Communications Simulator (JSF/F-22 Programs)



FY06 Activities

- **Modeling and Simulation**
 - Maintain OPNET
 - Evaluate other tools (e.g. QualNet, OMNeT++)
- **Implementation of Lab Plan**
- **CNS Emulation Testbed**
 - Initiate development of CNS Emulation Testbed
- **Mobile Van Upgrades**
 - Power / rack reconfiguration
 - 802.xx equipment install
 - Satcom system installation (Iridium, Inmarsat)
- **Flight/Field Demo Support**
 - Coordinate with subprojects