

June 9, 2006

Backup SATNAV Technology
STATEMENT OF WORK

The purpose of this task is to develop a set of potential “backup” **Area Navigation** solutions for NGATS. This solution set may include a broad range of possibilities including, but not limited to, a primary Satellite Navigation (SATNAV) system solution reliable and robust enough to not require a dedicated backup, and SATNAV based systems with dedicated backups ranging from inertial navigation systems onboard aircraft to alternative (non-satellite) navigation signals-in-space.

The results of this effort will be used to provide additional guidance for the development of a detailed NGATS Concept of Operations and NGATS architecture. The NGATS Institute shall assume that SATNAV is the primary means of navigation in NGATS.

Subtask 1:

The Institute shall provide a requirement analysis for any backup system, and articulate the basis for those requirements. As a part of this requirements analysis, the Institute shall consider the operational requirements for dependent position reporting (e.g. ADS-B). The institute shall also articulate and justify any assumptions made in the study, and provide a sensitivity analysis for those assumptions. This sensitivity analysis will be used to evaluate how a change in assumptions will affect potential solutions. The Institute shall consider the findings and recommendations of the 2001 Volpe study on GPS Vulnerability, and any subsequent related studies, as well as projected GPS/GNSS enhancements at the following points in time: years 2015, 2020 and 2025. This evaluation of projected enhancements to GPS/GNSS shall be used to aid in developing an implementation strategy for NGATS, which by necessity will include any required backups to SATNAV for years 2015, 2020 and 2025. The Institute shall consider the impact of the following documents/directives:

- U.S. Space Based Positioning, Navigation and Timing Policy; December 15, 2004, superseding Presidential Decision Directive/National Science and Technology Council-6, U.S. Global Positioning System Policy, March 28, 1996.
- The Federal Radio Navigation Plan (latest published revision)
- Homeland Security Presidential Directive/HSPD, Subject: Critical Infrastructure Identification, Prioritization and Protection; December 17, 2003.

The Institute shall include in its reports the results of any pertinent review of the above policies by any federal agency or federally-funded organization.

Subtask 2:

The Institute shall also provide a cost analysis to include the life-cycle costs for each proposed backup solution. This analysis shall also include a study of

June 9, 2006

the cost distribution among system participants, to include Commercial and Regional Airlines, Air Taxi services and general aviation aircraft and the air navigation service provider. The cost analysis shall also include assumptions on what portion of the cost might be borne by other elements of the transportation industry (e.g. maritime). Based on this research;

Subtask 3:

NGATS Institute shall develop a set of candidate solutions for an NGATS Navigation “Backup” System years 2015, 2020 and 2025. This set shall be accompanied by a detailed description of the strengths and weaknesses of each solution. In addition, all potential solutions shall be aligned with published JPDO/NGATS documentation including, but not limited to, the “Next Generation Air Transportation System Integrated Plan.”

Subtask 4:

The final report for this study shall include a set of alternative solutions, even if in the opinion of the Institute, one of the solutions is clearly superior to the others. At a minimum, the potential solutions shall include DME/DME, eLORAN, and aircraft resident Inertial Reference Systems.

Subtask 5:

The Institute shall conduct interviews with government, industrial, aviation organizations, and avionics vendors to identify alternative solutions and to gather information on operational and economic benefits of most interest to the commercial, business and general aviation communities. Interviews shall also be conducted with non-U.S. users and service providers to determine potential compatibility/redundancy issues that would result from non-U.S. preferred solutions. Interviews will be conducted on a face-to-face basis whenever practicable. Electronic means such as telephones or e-mail exchanges may be accomplished in order to minimize travel expenses.

Subtask 6:

The Institute study team shall conduct in-process reviews with the Agile IPT’s technical representative to ensure that study direction is consistent with on-going IPT planning information. The schedule for these reviews will be determined after task order award.