ATTACHMENT A: SE CORE CAPABILITIES

A.1   SE CORE CAPABILITIES

The following are descriptions of the SE Core Capabilities:

A.1.1   Air Traffic Management (ATM) Automation:

Technical knowledge and experience in NAS ATM automation systems (e.g., Terminal Automated Modernization/Replacement (TAMR), Automated Radar Terminal System (ARTS), Standard Terminal Automation Replacement System (STARS), Common ARTS (CARTS), Terminal Flight Data Management (TFDM), Decision Support Tools (DSTs), Host Computer System (HOST), En Route Automation Modernization (ERAM), Traffic Flow Management System (TFMS), and Advanced Technologies and Oceanic Procedures (A-TOP)(Ocean 21)) to include awareness of international system development trends and latest developments.

A.1.2   Air Traffic Rules and Procedures:

Technical and operational knowledge and experience in current procedures and policies, and technical and operational experience in developing proposed rules and procedures related to Air Traffic operations in the NAS.

A.1.3   Airspace Design and Analysis:

Technical knowledge and experience in airspace analysis, design/redesign, test, procedure development and configuration recommendations.

A.1.4   Avionics Systems:

Technical knowledge and experience in the systems engineering and testing activities of avionics systems, their functions, capabilities and interface requirements, and associated standards compliance requirements.

A.1.5   Business Process Re-engineering:

Technical knowledge and experience in identifying inefficiencies, including duplication within an organization, making recommendations for improvement, and establishing relationships with other organizations.

A.1.6   Communications:

Technical knowledge and experience in ground-, air-, and satellite-based communication systems, standards, policies, and procedures.

A.1.7   Cost Benefit Analysis:

Capability to prepare rough order of magnitude cost-benefit analysis. Conduct lifecycle cost and benefit analyses for individual and grouping of concepts commensurate with the scope and level of maturity of the concept. Technical knowledge and experience in providing Investment Analysis cost and benefit studies for large scale government type programs.

A.1.8   Enterprise Architecture Products:

Technical knowledge and experience in the development of Enterprise Architecture products in the area of aviation.

A.1.9   Fast-Time Modeling and Simulation:

Technical knowledge and experience in the design, development, testing and execution of fast-time modeling and simulation using appropriate/validated tools. Developing foundational methods and tools for addressing problems characterized as system-of-systems. Establishment of an effective frame of reference, crafting of a common lexicon, and study of various modeling and simulation techniques, including probabilistic robust design (including uncertainty modeling/management), agent-based modeling, network theory, object oriented simulations, and tools for capturing the interaction of requirements, concepts, and technologies.

A.1.10   Human Factors:

Technical knowledge and experience to identify, analyze, model, and predict the physical, cognitive, and social behavior characteristics of human interactions within the aviation system environments.

A.1.11   Human–in-the-Loop Simulations:

Technical knowledge and experience to simulate and evaluate human interactions within aviation environments in dynamic situations.

A.1.12   Information Technology:

Technical knowledge and experience in the development, implementation, and lifecycle support of information systems used in NAS and non-NAS Systems.

A.1.13   Integrated Laboratories:

Technical knowledge and experience in the design, development, operation, and maintenance of integrated aviation laboratories and test beds.

A.1.14   Investment Analysis:

Technical knowledge and experience in providing Investment Analysis cost studies for large scale government type programs.

A.1.15   NAS Air Traffic Facilities:

Technical knowledge and experience in the operations, maintenance, and certification of various types, kinds, and functions of NAS Air Traffic facilities.

A.1.16   Navigation:

Technical knowledge and experience in ground-, air-, and satellite-based navigation systems, standards, policies, and procedures.

A.1.17   Operational Concept Development and Validation:

Technical knowledge and experience of the activities performed to support concept development and validation. Concept development is characterized as the process that

describes, evaluates, and prepares a proposed capability, technology or procedure. Validation activities help quantify and qualify the operational feasibility and expected benefits of the concept.

A.1.18   Program Management:

Technical knowledge, experience and activities in the management of scope, cost, schedule, risk, quality, and stakeholder requirements.

A.1.19   Program Planning & Financial Analysis:

Technical knowledge and experience in providing support to large organizational programs pertaining to planning and financial analysis.

A.1.20   Requirements Definition:

Technical knowledge and experience in defining requirements for aviation related systems and activities.

A.1.21   Security:

Technical knowledge and experience in researching, designing, and developing and implementing policies, procedures, standards, and systems to ensure the security (e.g., information, cyber, physical, and operational) of the NAS, including, but are not limited to:

1. NAS and relevant non-NAS information systems;
2. Air Traffic Management operations and crisis response (both internal and external to the FAA);
3. Technical knowledge of National Institute of Standards and Technology (NIST) federal and special publications; particularly those providing details for FAA compliance with the Federal Information Security Management Act of 2002;
4. Technical knowledge and experience in the control families defined in NIST SP 800-53;
5. Technical knowledge and experience in NIST Cybersecurity Framework; and
6. Technical knowledge and experience Computer Security as defined in NIST SP-800.12;
7. Guide for Security Certification and Accreditation of Federal Information Systems defined in NIST SP 800-37;
8. FISMA and OMB Circular A-130

A.1.22   Service-Oriented Architecture:

Technical knowledge and experience in designing and developing procedures and systems which provide network centricity and service orientation to NAS and non-NAS systems.

A.1.23   Standards Development:

Technical knowledge and experience in the development and implementation of both national and international technical aviation standards (e.g., FAA, RTCA and ICAO standards).

A.1.24   Surveillance:

Technical knowledge and experience in ground-based, air-based, and satellite-based surveillance systems, standards, policies, and procedures.

A.1.25   System Safety:

Technical knowledge and experience with FAA and International Safety Risk Management / Safety Management Systems (SRM/SMS).

A.1.26   Unmanned Aircraft Systems (UAS) Operations:

Technical knowledge and experience with UAS operations to facilitate their integration safely and efficiently into the NAS. This effort requires collaboration with a broad spectrum of stakeholders, which includes manufacturers, commercial vendors, industry trade associations, technical standards organizations, academic institutions, research and development centers, governmental agencies, and other regulators. Ultimately, technical knowledge and experience to support UAS integration into the NAS without reducing existing capacity, decreasing safety, negatively impacting current operators, or increasing the risk to airspace users or persons and property on the ground any more than the integration of comparable new and novel technologies. In those areas of the NAS that have demanding communications, navigation, and surveillance performance requirements, successful demonstration of UAS to meet these requirements will be necessary.

A.1.27   Weather:

Technical knowledge and experience associated with detection, collection, processing, analysis, and dissemination of weather data and the integration of weather data into automated decision-aiding systems to support weather avoidance.

A.1.28   Environmental Analysis:

Technical knowledge and experience in environmental analysis including baseline analysis, alternatives analyses, and the National Environmental Policy Act (NEPA) and the use of tools such as the FAA's Aviation Environmental Design Tool (AEDT). Proven skills in generating environmental analysis metrics (e.g., noise, emissions, fuel burn) from fast-time and human-in-the-loop simulations as well as historical data.

A.1.29   Commercial Space:

Technical knowledge and experience with types of travel in and out of Earth orbit; space tourism; NextGen Air transportation Systems links to commercial space; and the challenges of safely and efficiently integrating commercial space with current NAS operations. Evaluation of economic, technological, and institutional developments related to commercial space and advice on new ideas and approaches for Federal policies, standards, and programs.

A.1.30   Systems Engineering & Integration:

Technical knowledge and experience with Systems Engineering & Integration involving the design & development, testing, installation, implementation, integration and transition of systems & systems-of-systems, components and equipment as required by the FAA Systems Engineering Manual (SEM).

A.1.31   William J. Hughes Technical Center (WJHTC) Laboratory Operations:

Technical knowledge and experience with the FAA William J. Hughes Technical Center (WJHTC) Laboratory which is the nation's premier air transportation system laboratory in the

test and evaluation, verification and validation, and the sustainment of the FAA's full spectrum of aviation systems. WJHTC activities span the development of scientific solutions to current and future air transportation safety challenges by conducting applied research and development utilizing a robust, one-of-a-kind, world class laboratory environment to identify integrated system solutions for the modernization and sustainment of the NAS for delivering NextGen operational capabilities.