

# NextGen Integration and Evaluation Capability

## Location

The NextGen Integration and Evaluation Capability (NIEC) is located at the Federal Aviation Administration William J. Hughes Technical Center, Atlantic City International Airport, New Jersey.

## Description

The NIEC is the FAA's research platform to explore, integrate, and evaluate NextGen concepts through simulation activities resulting in concept maturation and requirements definition. The NIEC Display Area (NDA) complements the unique NAS facilities and aviation based equipment located at the WJHTC.

The NIEC leverages existing NAS operational systems and high fidelity, real-time simulation capabilities to create an integrated, flexible and reconfigurable environment that can be tailored for NextGen research as well as test and evaluation. The NDA can provide a futuristic NextGen gate to gate visualization environment with advanced data collection capabilities to support integration and evaluation of new technologies and concepts. The ability to provide a combined environment of legacy systems with future technologies and capabilities also enable the NIEC to support the transition to NextGen.

Characteristics of the NIEC include:

- A collocated NIEC display area to support Human-in-the-Loop simulations
- A real-time, rapid prototyping and simulation environment that simulates the NAS while integrating NextGen enabling components
- Technical Center and external laboratory integration capabilities
- Voice communications capabilities
- Audio, video, and data recording capabilities
- The flexibility to support multiple concurrent studies



Figure 1 NIEC display area floor plan layout

- Available 24 hours per day 7 days a week
- Certified ISO 9001:2008 laboratory

## Mission

The NIEC's mission is to foster the exploration, evaluation, and integration of NextGen enabling components within a rapid prototyping environment for concept validation and maturation.

## Purpose

The NDA collocates and integrates key air traffic components into a single environment at the Technical Center to address emergent research questions (see Figure 1). Existing Technical Center capabilities were leveraged for initial NIEC operation. Additional NextGen capabilities will also be obtained through partnerships with federal agencies, industry and academia. The NIEC platform will evolve as research requirements emerge.

## Special Features

The base components of the NDA can be tailored for NextGen research and simulation as well as test and evaluation. The base components featured in Figure 1 are an Air Traffic Suite, a Cockpit Simulator, an



Unmanned Aircraft System Suite, a Simulated Tower, and a multi-purpose area. The multi-purpose area can be used to display weather data, traffic management data, operate as a simulation monitoring station or simulate an airline operations center. Each of these NIEC components mirror key areas in the NextGen “Gate-to-Gate” spectrum.

The Target Generation Facility (TGF) and the Distributed Environment for Simulation, Rapid Engineering and Experimentation (DESIREE) are existing simulation engines that are key in conducting NIEC simulations. TGF is a crosscutting infrastructure that is capable of simulating air and ground traffic that drives terminal and en route laboratories as well as developmental laboratories. DESIREE emulates the Graphical User Interface used in most air traffic control systems. These simulators work together to immerse the subject into a realistic environment that can emulate the past, present, or future air traffic environments.

Figure 2, the NIEC Functional Block Diagram, shows the building blocks of the NIEC. The NDA capabilities are featured in the gray box on the diagram. The light blue area provides examples of external facilities that the NIEC can interface with via Aviation SimNet to access remote cockpit simulators and air traffic simulators. The dark blue area highlights the internal

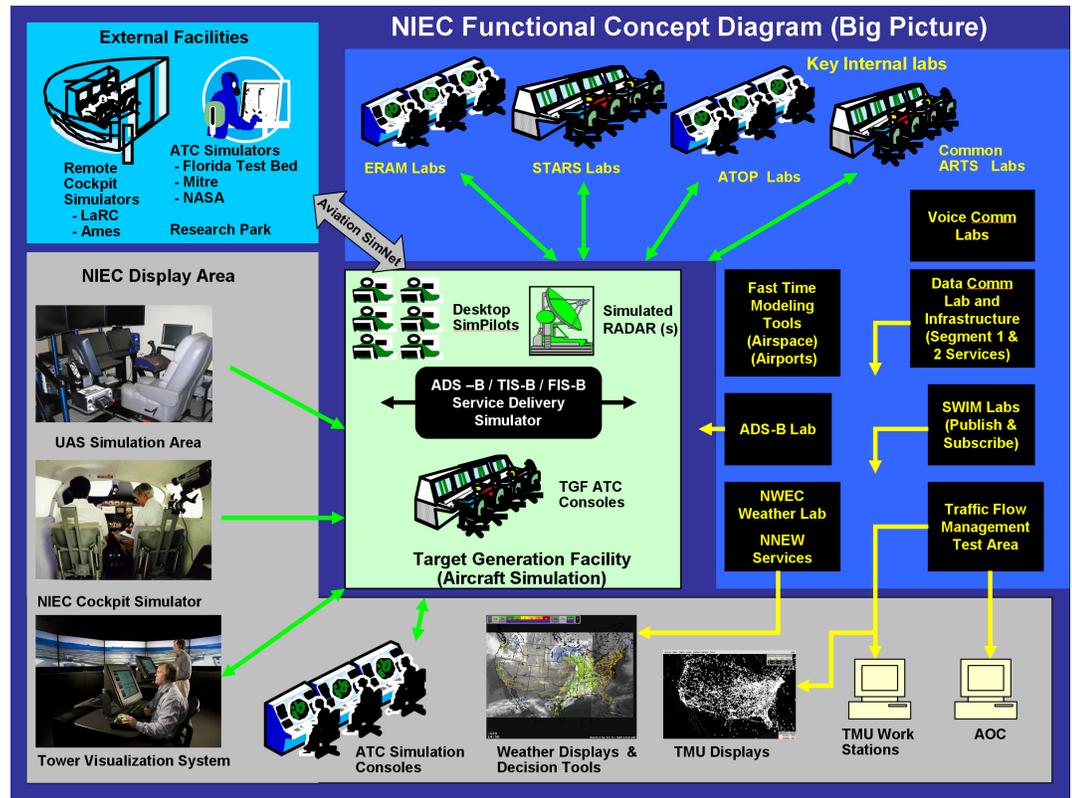


Figure 2 NIEC Functional Block diagram

NAS and Technical Center research facilities that the NIEC can interface with to support high fidelity simulations. The green box highlights the NIEC simulated capabilities for aircraft, pilots, radar, and Automatic Dependent Surveillance – Broadcast (ADS-B).

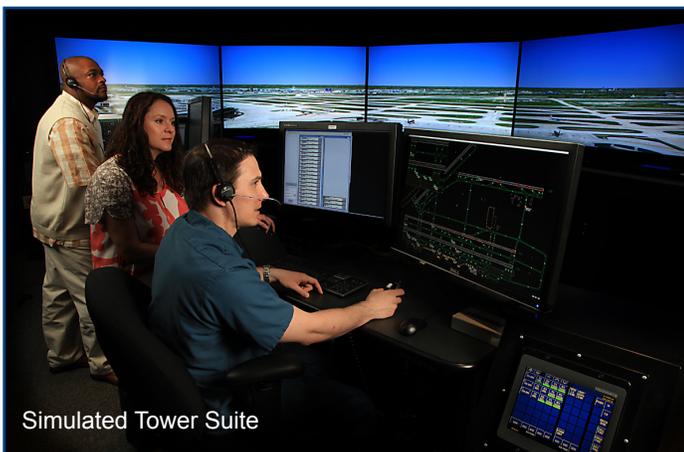
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