CYBERSECURITY CHALLENGES AS FAA IMPLEMENTS NEXTGEN
Two GAO Reports, Two Perspectives

INFORMATION SECURITY

FAA Needs to Address Weaknesses in Air Traffic Control Systems

AIR TRAFFIC CONTROL

FAA Needs a More Comprehensive Approach to Address Cybersecurity As Agency Transitions to NextGen
National Airspace System’s Transition to an Internet Protocol (IP)-Based Network

The National Airspace System (NAS) without NextGen technologies

- Terminal radar
- Control tower
- Airline operations and dispatch voice and data
- Flight services station
- Ground based navigation (legacy technology)
- Enroute radar
- FAA ground-base telecommunication lines provide point-to-point connectivity

The NAS with NextGen and legacy technologies

- Internet Protocol (IP)-based communications provide systemwide interconnectivity
- Improved routing
- Digital communication including text messages
- Interconnectivity via IP
- Satellite surveillance
- Automatic dependent surveillance – broadcast (ADS-B) equipped aircraft improve merging and spacing, and airborne and surface separation assurance

Examples of expected NextGen benefits:

- Reduced workload through digital communications and more precise surveillance and trajectories
- Increased terminal capacity using integrated ground-based traffic management and avionics technology
- Single weather source for flight planning and traffic flow information
- 4-D trajectories with fewer conflicts and more efficient routing using advanced probabilistic weather forecasting

Source: GAO | GAO-15-370
NextGen Transformational Programs

**Surveillance and Broadcast Services Subsystem (SBSS)**
A satellite-based information-broadcasting system to enable more precise control of aircraft

**Collaborative Air Traffic Management (CATM)**
Encompasses the development of systems to manage airspace and flight information

**Common Support Services—Weather (CSS—Wx)**
Provide real-time access to a unified aviation weather picture via SWIM

**Data Communications (Data Comm)**
Provides text communication transmissions directly to pilots and their flight management systems

**NAS Voice Switch (NVS)**
Replaces terminal and en-route voice-switching systems with a more flexible network

**System Wide Information Management (SWIM)**
The information management architecture for the national airspace system

Source: GAO | GAO-15-370
FAA Incorporates Cybersecurity Controls into NextGen Acquisitions
Traditional NAS ATC Systems Compared to Enterprise Approach

Legacy point-to-point system

NextGen IP-based system

External users

Security gateway

Certified software management

Internal policy enforcement

NAS IP Services

External boundary protection

Identity and key management

Incident detection and response

Continuous monitoring

Cybersecurity tools

Source: GAO | GAO-15-370
Basic Illustration of Aircraft Internet Protocol (IP) Connectivity Inside and Outside of Aircraft

Source: GAO | GAO-15-370
Thank you for your time today.
Questions?