

Military ATM:

Meeting Civil Standards

The U.S. Air Force and Navy are upgrading aircraft to meet air traffic management standards. The price is steep but continued access to airspace is worth the cost.

By David C. Walsh

As the civil air traffic management (ATM) infrastructure evolves to accommodate rapid traffic growth, military managers are rushing to meet changing coms, nav and surveillance (CNS)/ATM requirements. Otherwise, they risk penalties—from inefficient routings to denial of airspace.

Compliance involves Mode S-capable transponders, 8.33-KHz VHF radio channel spacing, and avionics for required navigation performance/area navigation (RNP/RNAV), reduced vertical separation minimum (RVSM) and automatic dependent surveillance (ADS).

"Modernization is important for the safety and economy of operation," says Paul Hogg, system chief engineer with the F-16 Systems Group of the Aeronautical Systems Center (ASC). As the airspace gets more crowded, "CNS/ATM initiatives attempt to better control the air traffic so our aircraft may fly safely, be efficiently handled at cluster points, and fly the most direct routes."

The Air Force and Navy began modernizing transport, tanker, VIP and utility aircraft first. Fighters, bombers and special mission aircraft were added to the list more recently, largely because of European mandates for VHF channel spacing and Mode S.

U.S./European talks have aimed at "equivalence," the use of equipment that is functionally equal, if not the same, as what is mandated. Eurocontrol welcomes this approach but insists on the deadlines.

The USAF and Navy both are well on the way to achieving 8.33-KHz spacing and



USAF KC-135s have undergone ATM interoperability upgrades, including automatic dependent surveillance and controller pilot data link communications. An earlier program added traffic and terrain warning. Old (top) and new cockpits are shown above.

are making good faith efforts to achieve Mode S. Soon-to-be retired aircraft, as well as trainers, which won't fly in European airspace, will be exceptions.

Information Challenge

The Air Force's Global Air Traffic Management (GATM) program helps acquire CNS/ATM gear for various aircraft.

Cargo carriers and tankers have been leading the pack since they're more closely associated with the commercial carriers, says Lt. Col. Mike Harrington, GATM

program chief. The program office assists Air Force units with their integration efforts. It also helps Air Mobility Command and Air Combat Command (ACC) determine the civil communications, navigation and surveillance capabilities that need to be integrated on their aircraft.

Harrington's shop provides services to aircraft acquisition sustainment groups. This includes understanding regional, national and international standards in airspace requirements. "We extract the relevant data from each document source

eventually many of the CNS/ATM initiatives will also be required in U.S. airspace."

Navy Upgrades

Chris Hoover, the Navy's CNS/ATM team lead at PMA 209, Air Combat Electronics, says the Naval Air Systems Command's (NAVAIR's) program focuses on 8.33-KHz channel spacing, Mode S, RNP/RNAV, and RVSM.

Hoover calls FMI "not really a capability but an improvement on a deficiency," dealing with ILS systems and FMI for radios' coms control. "We've taken

care of FMI for ILS systems for most of the platforms, and new radios being procured have FMI."

The goal for RNP/RNAV, he continues, was to "minimize surgery and downtime to the aircraft and go for RNP 0.3 with containment alerting, which encapsulates all the other RNP requirements, as well."

The P-3 and E-2C Hawkeye 2000—the only tactical naval aircraft without 8.33-KHz channel spacing—are being brought up to CNS/ATM standards. Beginning in FY07, P-3s will be upgraded for RNP/RNAV, channel spacing and

Mode S. Because the P-3, C-2 and E-2C do not fly above FL290, they do not require RVSM capability.

As to Eurocontrol's requirement for both elementary and enhanced Mode S (depending on aircraft performance requirements and platform characteristics), Hoover says, "Most NAVAIR platforms require enhanced surveillance, save for helicopters and fighters which can get by with elementary."

Now that the date for elementary and enhanced has shifted to March 2009, Hoover believes enough type/model series will be modified by then to "allow us to accommodate our missions in those airspaces that require Mode S."

The Navy also plans to leverage military avionics as much as possible to meet civil requirements. "We're not putting two transponders or different navigation systems into the aircraft to accommodate civil and military requirements. We're ensuring our solutions meet both civil and military capability requirements today and meet or support cost- and schedule-effective growth to civil and military requirements of the foreseeable future."

The F/A-18, for example, already has a combined interrogator/transponder that is being upgraded for Mode S. The Navy is integrating Mode S in the current block upgrade E/Fs.

"We surveyed all our avionics across the Navy to see if what was out there was upgradeable to meet the new civil interoperability requirements," Hoover says. "Where they were able to grow ... we've done so, such as [with] the embedded GPS/INS (EGIs) for RNP/RNAV."

Analog transponders like the APX-100s also are being replaced with existing APX-118s. "So we're not developing anything new," says Hoover. The Navy is leveraging existing avionics and upgrading where necessary.

Upgrades to the EA6-B Prowler electronic countermeasures platform for Mode S should commence in late FY06/early FY07, Hoover says. The aircraft already has 8.33-KHz spacing.

The Navy is doing a good job in meeting civil interoperability requirements, says Hoover. "Our GPS solutions aren't just going to meet RNP/RNAV in the civil requirements; they're going to support our future military GPS requirements for NavWar and Joint Precision Approach and Landing System (JPALS)." The Navy's Mode S architectures also will support not only civil requirements but future military IFF or surveillance requirements, he says. **BVS**

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