balancing available technology with the inevitable shifts in what governments will spend to achieve incremental gains, it’s tough to say what the air traffic management (ATM) environment of tomorrow will look like. Weren’t we all supposed to be living in a Free Flight utopia by now? Instead, little has changed in the way business aircraft pilots fly day to day—with the possible exception that the FAA finally decommissioned about 400 NDB approaches, shifting the money used to maintain them to a number of future-minded R&D projects.

The one causing the biggest stir these days is required navigation performance (RNP). Once thought of primarily as a specialized (not to mention pricey) option for airlines flying into hard-to-reach mountain airports like Juneau, Alaska, RNP is winning serious consideration among the aviation mainstream, and some say it could become an integral part of the future National Airspace System. The benefit of RNP is that appropriately equipped aircraft can shoot complex, curving approaches with needle’s eye accuracy to minimums thanks to the procedures’ precise path-keeping capabilities.

According to some experts, a host of “required performance” operating regimens could eventually come into existence, from required surveillance and communications performance to required environmental performance.

Under such a system, aircraft-handling priority would be given not to those arriving first but rather to those who best meet the performance criteria for a given airport or block of airspace.

It sounds alarming until you consider something truly disturbing: the introduction of military UAVs into the National Airspace System. These pint-size unmanned aerial vehicles in some cases will incorporate lethal firepower and cutting-edge spying capabilities, yet they won’t carry so much as a transponder to trigger a TCAS warning in the cockpit. The fact that most of these flying robot-soldiers will be quite small (arms-length wing spans will be about the norm for most military UAVs) provides scant comfort, but at least the day when UAVs and civil airplanes mix regularly is still many years away, according to experts.

Another interesting technology that could start appearing in headlines with more regularity is LAAS (local-area augmentation system). The FAA’s phased development contract intended to lead to initial LAAS Category I approach capability was canceled in 2004 due to signal integrity problems. LAAS development is moving slowly, but with the full commissioning of WAAS (LAAS’s wide-area counterpart) recently, many experts believe it is only a matter of time before the ILS replacement technology returns as an FAA priority.

Europe, meanwhile, continues to push ahead with its Single European Sky initiative to address long-term congestion and capacity issues. In the nearer term, the surveillance and spacing benefits afforded by ADS-B (automatic dependent surveillance-broadcast) are getting close look as a way to alleviate mounting delays. Even small increases in capacity can add up to big savings for European airlines, but it’s all a balancing act between costs and expected benefits.

The following series of articles dealing with future airspace initiatives takes a closer look at each of these important issues.

—Stephen Pope
RNP brings curved approach paths and ‘tunnels’ in the sky

Required navigation performance (RNP) approaches are attracting increased interest in the business aviation community, according to many of the attendees at this year’s NBAA Convention in Orlando. RNP experts cited three main reasons for this interest. First, after being promoted as a “coming concept” for some years, along with its well known pioneering use with Alaska Air-

lines, RNP has finally arrived in the lower 48. And not just at major airline hubs such as JFK and ORD, but also at airports such as Palm Springs, Calif., a frequent corporate destination.

Second, most of the larger airplanes now entering the business fleet are potentially capable of flying RNP’s unique, curved flight paths. Third, the FAA has launched a public RNP procedures program, as opposed to a previous number of “specials” for the “exclusive use of specific air-

lines.” According to many of the attendees, the FAA had published 28 public procedures, with a plan to issue at least 25 more a year hence.

This news doesn’t surprise Bob Lamond, NBAA’s director of air traffic services and a longtime advocate of RNP’s potential value to business aviation. “We were among the earliest support-

ers of the FAA’s RNP initiative, which will be especially benefi-

cial to our members operating into airports challenged by ter-

rain, obstacles, ATC or political boundaries, environmental issues and congestion,” he said.

So what exactly is RNP? Everyone knows about RNAV (area navigation), so the simplest explanation of RNP is that it’s RNAV with two additional, but es-

sential, requirements. These are the ability of your flight manage-

ment system to stay in a narrow, tightly defined tunnel of airspace and alert you immediately if you are drifting off it, and its ability to fly curved paths. The first cap-

ability is called containment, and the curved paths are called radius-to-fix turns. Neither of these requirements can be met by hand flying the airplane. This is one place where automation really shines.

The approach chart for Palm Springs shows what you get for your avionics investment. Instead of needing to see PSP from 1,850 feet over the beacon-the current nonprecision approach procedure—or diverting, RNP will take you safely down inside the valley to DAs of either 408 feet or 277 feet agl on final, depending on how much money you’ve spent. The minimums box shows that an RNP 0.17 capability gets you a lower DA than an RNP 0.3. That’s because the former capability will keep you within 0.17 nm of the required path for 95 percent of the time, while the latter will keep you within 0.3 nm.

And for safety, the RNP rules call for the flight paths to add an extra buffer of the basic RNP value to either side, to cover 99.99 percent assurance of ob-

stacle clearance. So in the case of RNP 0.3—which is the entry level for all new RNP users, regardless how well equipped they are—the pilot has 0.6 nm either side as he’s going around the mountain. On a VFR day, the view on this type of approach would be fantastic.

How to tell if you’re really ‘RNP-ready’

What avionics do you need for RNP? Unfortunately—or maybe that should be fortunately—there’s no simple answer. RNP is a “per-

formance-based” concept, under which the various performance levels and combinations of the airplane’s FMS, autopilot, altimeter, GPS, other nav aids, flight-

deck displays and several ad-

ditional factors are weighed against each other to determine its overall RNP capability.

How can you tell your aircraft’s capability? Some recent large aircraft have reportedly included their RNP category in the limitations section of their AFMs, but this is not at the beginning of public RNP practice. A recommended start could be to consult NBAA’s Operations Support Group since Bob Lamond, NBAA’s director of air traffic services, and other association specialists have been involved with RNP-related issues since they were first raised several years ago. But remember that while car-

riers such as Alaska Airlines have been flying RNP “specials” for quite a while, business aviation is at the beginning of public RNP operations, and there could still be issues that remain to be resolved.

Compliant avionics aren’t the only consideration for conduct-

ing RNP operations. The FAA’s public procedures are labeled SAAAR, for special aircraft and aircrew authorization required, which means both the aircraft and its pilots must pass muster. Advi-

sory Circular AC 90-101 spells out the details of pilot training and recurrent standards.

Before going that far, however, pilots looking for an introductory overview of what RNP and SAAAR are all about should get a copy of an easy-to-read, non-tech-
nical white paper by Rockwell Collins on the subject, with the re-

quest going to Pam Tvrdy at pjtvrdy@rockwellcollins.com. First distributed at an RNP session at the NBAA Convention in Orlando, the paper has become a runaway suc-

cess, garnering high praise from a number of FAA and other officials.

After that, they should review the FAA’s just released RNAV/RNP Roadmap, at www.faa.gov/ats/atp /rnp/rnav.htm. The document pro-

vides a glimpse of the expected progression of nationwide RNAV and RNP implementation from now through 2025. It clearly illu-

strates the increasing emphasis that will be placed on having ei-

ther, or both, of these capabilities, and the benefits they will offer. The roadmap covers en route, term-

inal and approach operations and spells out the proposed RNAV and RNP values that will apply in each of these environments.

Yet while the FAA is moving ahead with RNP, Canada has already stolen a march. Calgary-

based WestJet decided three years ago that since it couldn’t match Air Canada in size, it would have to beat the airline on schedule reliability.

With 63 Boeing 737NGs in operation and another 18 on order, the company opted for fleetwide RNP installation, and now has 140 Transport Canada (TC)-approved non-public procedures, providing approach and departure guidance at 70 runways across its domestic network of 20 airports, many of which are in or near the Canadian Rockies. That’s approaching four times as many as are approved in the U.S. for airlines and public use combined.

WestJet contracted a private company–Naverus of Seattle–to develop the procedures, which were then test flown and approved by TC flight inspectors, a proce-

dure different from the one the FAA uses. Naverus is also active in China, where three mountain airports, including at Lhasa, Tibet, have RNP approach and departure procedures, with as many as 50 more airports across China scheduled to have them in the next four years.

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In ATC’s tomorrowland, ‘first come, first served’ could give way to ‘best equipped’

By 2025, air traffic across the globe is forecast to double, and possibly triple. Preparing for a busy tomorrow, international groups are developing ways to keep the system running as smoothly as possible.

Already, it’s recognized that the current ATC system will not be able to handle such volumes, so one future aim is to increase system capacity by having aircraft operate within tighter airspace tolerances while improving on today’s safety levels. In that future world, for example, ATC’s traditional “first come, first served” philosophy will be replaced in high-density areas by giving priority access and routings to the best equipped aircraft, with the less well equipped being directed to less busy, and probably more circuitous, flight paths. As a result, one set of standards will no longer fit all.

The admission ticket to given types of airspace will be keyed to performance-based aircraft standards in three classifications, the first of which is RNP. The other two are required surveillance performance (RSP) and required communications performance (RCP). When combined, the three become the required total system performance (RTSP) of the aircraft and its crew.

But RNP relies on self-contained cockpit systems, RSP and RCP will be strongly dependent on surface facilities. Consequently, there will be a parallel need for highly reliable ground-based surveillance and communications infrastructures, developed to meet Required Air Traffic Management Performance (RATMP) standards, currently under development. There will also be a need, for course, of money for to pay for it all.

Air traffic planners agree that establishing values for the RCP and RSP components of RTSP will be much more challenging than for RNP because any assessment of the TLS of communications and surveillance operations must balance the combined capabilities of the aircraft and the ground environment. Here, some aviation industry officials are already concerned that an unequalonus could be placed on the aircraft, to make up for shortcomings on the ground.

For example, the accuracy and capacity of today’s secondary radars are difficult to measure precisely, and that could result in a requirement for more advanced, and more costly, transponders to meet the TLS standard. On the other hand, because ATM capabilities can be less advanced in less developed parts of the world, even the most modern aircraft could find themselves operating in a much lower TLS environment than they were equipped for.

Pilots are just getting used to the term RNP, but the day could soon come when a whole host of required performance standards are adopted. Collectively known as Required Total System Performance, the new standards would cover navigation, communications, surveillance and possibly many other areas.

RTSP: the Future Performance-based Standard?

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RTSP (Required Total System Performance)

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<thead>
<tr>
<th>Classification</th>
<th>Technologies (potential)</th>
<th>Resources</th>
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<tbody>
<tr>
<td>RNP (navigation)</td>
<td>FMS, GPS</td>
<td>Self-contained cockpit systems</td>
</tr>
<tr>
<td>RCP (communications)</td>
<td>datalink, satcom</td>
<td>Surface facilities: ground-based surveillance and communications</td>
</tr>
<tr>
<td>RSP (surveillance)</td>
<td>ADS-B, mode-S, merging and spacing</td>
<td></td>
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</tbody>
</table>

Other Performance Measures

<table>
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<tr>
<th>Environmental</th>
<th>Trajectory prediction*</th>
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<tbody>
<tr>
<td>Automation</td>
<td>Conflict detection*</td>
</tr>
<tr>
<td>Weather</td>
<td>Distance vectorion*</td>
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<tr>
<td>Security</td>
<td>*Proposed by Boeing Phantom Works engineers</td>
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strict—often referred to as “gold plated”—agency specifications, which are fine for the feds but usually not up to the expectations of most others. Honeywell’s continuing work has therefore been aimed at meeting the less rigorous FAA FAR-171 specification for non-federal systems.

Both specifications call for the same quality of guidance signals to pilots, with the difference being the dramatic reduction in extra bells and whistles in the non-fed ground equipment. Honeywell told AIN that it expects to receive FAA type acceptance of its Memphis prototype as a “provable safe design” next year, after which the company expects to complete its FAR-171 qualification work using the Australian system, with a target date of December 2008. The Memphis, Bremen and Malaga systems will subsequently be FAR-171 certified by the FAA and the German and Spanish authorities, respectively.

At that point, Honeywell will be moving its international LAAS sales program into top gear, but under ICAO’s ground-based augmentation system (GBAS) Cerwin said he sees a large market for Category I GBAS, particularly in developing nations now considering upgrades to their less well equipped airports. “When you take the long view of the evolution of landing systems,” he said, “GPS has to be the next window of opportunity for precision approaches.”

In the overseas market, Honeywell has a marketing agreement with Airservices Australia, the country’s privatized ATC provider, which already has a large number of aviation support contracts in Asia and Africa, and which has made significant investments in the Australian GBAS evaluation and certification program. Australian airline Qantas has nine of its newest Boeing 737NGs equipped to use the Sydney system, with more aircraft installations planned.

Keith McPherson, Airservices GNSS manager, told AIN that SBAS would be essential at Sydney when Qantas starts operating the 20 Airbus A380s it has on order, since the guidance beams of the airport’s ILS systems risked being distorted when aircraft that large moved around its rather confined runway and taxiway layout.

Farther ahead lies the development of Category II and III systems, although these would involve substantial technical effort and a much more arduous certification process. Corwin allowed that these were challenging goals but was nevertheless optimistic that they could be achieved. All will depend on the rate of SBAS acceptance by airlines and airports.

Will LAAS return to the FAA’s list of future programs? It seems likely, but probably not until the system achieves Category III certification, which U.S. airlines have stated as necessary before they would be ready to transition from ILS.

LAAS development is stuck in neutral, but proponents are revving their engines

During the 1980s and 1990s, the wide-area and local-area augmentation systems (WAAS and LAAS) were under FAA development as methods of improving GPS accuracy. WAAS was aimed at providing a future nationwide replacement for NDBs and most VOR/DMEs, while LAAS was intended to replace ILS. WAAS would send accuracy corrections down to all GPS users from geostationary satellites high above the equator, while LAAS airport-based stations would transmit much finer corrections to the aircraft that large moved around its rather confined runway. WAAS went into a two-year hiatus in 2001 while its problems were sorted out but returned to full operation in 2003 and has seen a number of improvements since then. These culminated in the FAA’s announcement this summer that WAAS had achieved ILS equivalence for 200-foot DA precision approaches, and that public procedures were planned by late next year.

LAAS has moved more slowly. The FAA’s phased development contract with Honeywell, intended to lead to an initial Category I production run before NAS-wide implementation, was canceled in 2004 due to the system’s inability to achieve the required signal integrity level. The program was then relegated to a research-and-development activity, where it joined previous LAAS Category II and III efforts. In parallel, an FAA official told industry officials that “there was no business case” for LAAS Category I, since its benefits to both the FAA and to users were insufficient to justify the costs of switching from ILS.

However, the FAA did continue a lower level of financial support for further R&D work by Honeywell, along with company funding, and this has subsequently expanded to cooperative work with Australian, German and Spanish aviation authorities, as well as FedEx, which sees the system’s benefits at some of its less well equipped overseas stations.

Currently, prototype Honeywell LAAS systems are being tested overseas at Sydney, Bremen and Malaga and at the company’s main hub in Memphis, with FAA funding support limited to Memphis. Honeywell has already introduced to FAA planning manager Bill Corwin told AIN that results so far look promising, and that the earlier integrity problems have now been overcome.

Under Honeywell’s original FAA contract, the LAAS equipment was to be built to strict—often referred to as “gold plated”—agency specifications, which are fine for the feds but usually not up to the expectations of most others. Honeywell’s continuing work has therefore been aimed at meeting the less rigorous FAA FAR-171 specification for non-federal systems.

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The days of sharing the skies with UAVs are still a long way off

Conventional wisdom says that by 2020 the sky will be black with VJIs. That might or might not turn out to be so, but long before then it could become overcast if the Army’s plans to have 10,000 UAVs (unmanned aerial vehicles) by 2011 work out. The good news is that few of them are likely to be operating in or near civil controlled airspace. The bad news is that most of them are unlikely to carry transponders to identify themselves to controllers and civil aircraft.

This isn’t because the Army is playing hardball. It’s primarily because most of the Army’s UAVs will be small, with wingspans of less than four feet or so and little payload or electrical power to spare. In addition, they don’t expect to encounter civil traffic where they’ll be flying. For the most part, too, they’re expendable — although your airplane shouldn’t be the one they’re expended on. Staying well clear of their airspace is the safest option for civilian operators.

The far bigger problem lies with the expectation that larger UAVs, both military and, one day, civil, will need to fly in controlled airspace, with one study predicting that the world UAV market will exceed $54 billion over the next 10 years. The Navy and Air Force expect that by around 2020, almost half their aircraft will be unmanned. Lockheed Martin has already proposed an unmanned version of its Joint Strike Fighter.

Consequently, collision avoidance has become the UAV industry’s major challenge. But a full TCAS installation, for example, is too expensive and hungry for all but the largest and most sophisticated aircraft such as Northrop Grumman’s Global Hawk, which cruises at around 65,000 feet and climbs and descends mainly through military corridors.

But a growing number of midsize machines are being developed between the Global Hawk and the Army’s miniplanes, and FAA associate administrator for aviation safety Nick Sabatini told Congress in June, “There is currently no recognized technology solution that could make these aircraft capable of meeting regulatory requirements for see-and-avoid [maneuvering] and command-and-control.”

FAA experts predict that it could take eight to 10 years to obtain an acceptable see-and-avoid system for UAVs. The command-and-control requirements are better understood, since they must meet already established manned aircraft airworthiness standards to fly in civil airspace. Here, both the air vehicle and its ground control component are regarded as a single system, subject to the same airworthiness certification level. But much higher standards will be required for the radio communications links between the two, including the less widely mentioned need to prevent airborne takeovers by hackers or others with more serious intent.

Currently, every UAV flight in civil airspace — and there are very few — is closely managed under individual FAA certificates of authorization requiring 30 days prior notice, and, in some cases, a chase plane monitor. The agency’s Unmanned Aircraft Program Office, AFS-401, established these and other broad rules for UAV NAS operations under its Policy 05.01 but is considering relaxing them slightly for small experimental UAVs, although significant restrictions would still apply.

The FAA’s caution is understandable. So far, UAVs have not enjoyed a pristine safety record, and even smart machines such as the Global Hawk and the slightly smaller Predator have wriggled loose from their ground controllers and crashed, despite having built-in programs to return to base after, say, loss of communications. On a number of occasions, Army officials have requested local radio stations near their launch sites to ask listeners to look out for small UAVs that had disappeared.

The FAA appointed RTCA’s Special Committee 203 in 2004 to examine all aspects of UAV NAS Operations, and its report is expected this month. The report will recommend steps toward allowing UAVs to fly in civil airspace with an “equivalent level of safety” (ELOS) to manned aircraft. With ELOS, UAVs would appear to controllers as no different from regular traffic, requiring no special handling, and with controllers communicating with the UAV’s ground “pilots” over a VHF datalink. In parallel, several senior industry officials have formed a new non-government body, the Center for UAS Integration in the NAS, with broadly similar objectives.

Nevertheless, while UAVs will undoubtedly one day share civil airspace, that day still seems a long way away.

Europe’s challenge is to segregate its airspace by need, not national borders

An unforeseen consequence of the 1944 Chicago Convention that established the International Civil Aviation Organization and made states responsible for their own airspace was the inefficiency of air traffic management in Europe, where unit costs are nearly twice as high as in the U.S.

At the turn of the century the European Commission embarked on a concerted effort to streamline the continent’s convoluted airspace, instituting the Single European Sky (SES) program to eliminate the constraints imposed by the web of terrestrial borders. Instead, it wants the future air traffic management (ATM) system to be based on functional airspace blocks (FABS) structured to reflect operational needs rather than arbitrary administrative boundaries. Since then the project has steadily gathered momentum. The EC has forged a closer working relationship with Eurocontrol and has even become a member of the organization. In 2004 European Union legislation framed the regulations for creating the single sky, along with service provision, airspace and interoperability regulations.

The European Union endorsed the single sky in December 2003. And in November last year a 30-strong consortium formed by airspace users, airports, air navigation service providers (ANSPs) and industrial suppliers signed a contract covering the two-year definition phase of the SES implementation program.

The consortium is due to produce a series of documents culminating in a European ATM master plan for the air traffic system in 2020 and beyond, along with a work program for the first phase of implementation. The first, an analysis of the current air transport framework, appeared in July.

The political and institutional efforts have helped accelerate a trend toward privatization and commercialization among the continent’s ANSPs. The UK’s NATS, privatized in 2001 with a 49-percent government holding, is the subject of takeover interest, as the seven-strong group of UK airlines that invested $95 million ($50 million) for a 46 percent stake in 2001 looks to unload the shares. The holding was reduced to 42 percent when airport operator BAA took a 4 percent stake to help bail out the company after its business was almost fatally wounded by the post-9/11 air traffic slump; losses totaled more than $190 million in the two years through March 2003. The picture has changed since, and the company earned nearly $315 million on revenues totaling $2.47 billion over the last two financial years. Analysts have estimated that the business could be worth $1.14 billion ($600 million).

NATS chief executive Paul Barron said, Continued on page 41
A ‘Single European Sky’ may work in 2020, but what about right now?

While the Single European Sky initiative is focused on the continent’s medium- and long-term capacity needs, there is a looming short-term capacity shortage in Europe that has to be addressed immediately, experts say. During the 1990s, as capacity growth lagged behind the increase in traffic, flight delays increased steadily. Since 1998 they have fallen by more than five minutes per flight to what George Paulson, Eurocontrol’s director of ATM programs, describes as the “economic optimum” of around one minute per flight. Capacity increased 45 percent between 1997 and 2005 while traffic grew at a rate of only 30 percent. Now traffic is growing faster than capacity: without a 20- to 25-percent increase in capacity, planners warn, delays are set to start climbing again in 2008.

Eurocontrol’s solution is the introduction of automatic dependent surveillance-broadcast (ADS-B) and expanded use of controller-pilot datalink communications (CPDLC). The agency’s Link 2000+ program has already introduced on route CPDLC, while mode-S enhanced surveillance brought downlink of aircraft parameters (DAP). Now Eurocontrol’s Cascade program, which deals with an array of datalink communications technologies, is coordinating the implementation of ADS-B surveillance, expanded use of CPDLC and additional datalink services.

Paulson said he sees Cascade as part of the foundation of a new ATM system featuring airborne self-separation. More immediately, he believes, it is Europe’s only hope of avoiding an imminent return to choking en route delays.

What the new services offer, according to program manager Alex Wandels, is cost-effective quality surveillance plus improved situational awareness in the cockpit in the case of ADS-B, and clear messages via CPDLC that will be quiet and non-intrusive

Technologies such as ADS-B and CPDLC could serve as a bridge to alleviate delays until the Single European Sky concept is introduced.

Europe faces tough business realities

The Single European Sky assessment describes the current European air traffic situation as a network of around 30,000 commercial flights per day operated by 5,000 aircraft flying among 100 main and many secondary airports. Currently services are provided, mainly on a cost-recovery basis, by national monopoly air navigation service providers. All are at least partially government owned and operate largely within national boundaries. Changing the institutional basis for their operation means confronting some daunting business realities.

Safety is the fundamental reason for ATC’s existence, but its place at the top of the priority list has an economic basis, too: the maximum exposure of an ANSP in the event of a midair is approximately $2.5 billion. And minor variations in demand or in ANSP performance have a dramatic economic effect on providers or users.

ADS-B a potential pill for cost cutting across Europe?

Last month Eurocontrol released the latest draft of its ADS-B policy, newly amended to incorporate comments from the stakeholder consultation group. The policy will form an input to Single European Sky ATM implementation (now known as Sesar), and will be altered where necessary to retain consistency with the program.

The agency sees its surveillance strategy is based on the three distinct but complementary techniques of primary and secondary radar: ADS-B using the 1090-MHz extended squitter (ES), datalink and multilateration. The choice of any technique or combination will be made on the basis of operational needs tempered by environmental and cost-benefit considerations.

ADS-B, of course, scores heavily under the last heading: not only are the ground stations a fraction of the cost of rotating radar installations, but the airborne mode-S transponders are widely installed as a result of the European TCAS and mode-S mandates.

Deployment, according to the revised policy, will start with “ADS-B out” to support ground surveillance applications. The first of three planned steps will be deployment from 2008 in non-radar areas or to supplement radar surveillance so that surveillance-based separation minimums can be introduced where there are none today. Secondary airports and other areas with no or poor surveillance will be the next candidates, and the third step will be to replace one layer of radar coverage with ADS-B when the opportunity arises so as to reduce surveillance costs.

In the medium term, based on the availability of capable aircraft, will come applications for airborne surveillance requiring air-to-air communications, or “ADS-B in.” Airborne traffic situational awareness will be the first, probably starting in non-continental airspace. That is due to be followed by more complex space applications such as the in-trail procedure and ultimately the transfer of responsibility for separation to the pilot. The timetable aims for standardization by 2009, certification the following year and implementation beginning in 2011.

Interoperability is another consideration. The U.S., Canada and Australia have all opted for 1090 ES-based ADS-B, and where VHF digital link Mode 4 is used (Sweden is deploying a surveillance network based on this technology), Eurocontrol says its implementation must respect the requirement for interoperability.

The U.S. also plans to use the universal access transceiver datalink for general aviation because of fears that the 1090-MHz frequency band will be overloaded. UK research firm Qinetiq, whose Quadrant combined ADS-B and multilateration receiver is currently being commercialized in partnership with German ATC specialist Comsoft, says those fears are unfounded.

Robbin Garrity, Qinetiq’s head of ATM, said that as soon as secondary radars start to be retired, the radio frequency environment begins to improve dramatically. In fact, the company has modeled ADS-B activity in the UK with a volume of traffic 10 times the maximum expected today: “We found it still had negligible effect on the spectrum,” he said. “Old secondary radars are by far the most damaging.”

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he sees his company as a standard-bearer for the future of air navigation service provision. “The UK has proved that change can be achieved and NATS is proving that it works,” he told a recent industry gathering. And he predicted a rash of business realignment as ANSPs are exposed to industrial reality: “The single European sky will be realized only by mergers, acquisitions and joint ventures. Efficiency will be achieved only by closing centers, sharing technologies and rationalizing functions. This is common language in the industrial world but is still whispered in corridors in the ATC industry.”

The whispers are growing louder. NATS itself has been quick to explore the potential for FABs, commissioning a feasibility study in partnership with the Irish Aviation Authority on an FAB combining the two providers’ airspace. It has also formed a joint venture company with its Spanish counterpart, Aena, to develop an air traffic management system based on Spain’s existing system that is intended to be capable of handling the complexities of UK airspace. The new-generation system is scheduled to be introduced initially in Gran Canaria next year and subsequently at the UK’s new ATC center at Prestwick and its existing center at Swanwick.

NATS and Aena are also working with Germany’s DFS on an evaluation of next-generation flight data processing systems (FDPS), a field that had already spawned a partnership between Europe’s two main ATC equipment suppliers, Thales of France and Italy’s Selex, to develop the Coflight FDPS. The project was initiated by the French and Italian ANSPs DSNA and ENAV in 2003; Switzerland’s Skyguide joined in 2004. As it is developed, the new FDPS should support future functions such as trajectory negotiation by datalink and ultimately conflict detection as well.

At the same time, Skyguide and DSNA are exploring the creation of a FAB, with ENAV as an observer to the discussions. Four Nordic countries—Denmark, Finland, Norway and Sweden—had already initiated the NUAC project to look at unifying their upper airspace, with additional studies focused on Danish airspace and part of Sweden’s southern airspace below FL 285. Sweden’s LFV and Denmark’s Naviair subsequently agreed to expand the NUAC program to include all Danish and Swedish airspace. One of the options under consideration is a merger of the two ANSPs.

The Netherlands, which houses the Maastricht center that controls upper airspace over the Benelux countries and southern Germany, is examining possibilities for a Europe Central FAB covering the four countries. And the southeast Europe FAB approach program is exploring an initiative to create one or more FABs covering nine Balkan states.

So is RNP the way to go for everyone? Probably not, unless an operator has to get in to some of the “difficult” locations such as Palm Springs, Calif., right away, or expects to do so fairly often. For most, early compliance will be a cost versus benefit calculation until a significant number of airports offer the capability. On the other hand, getting the chairman of the board to his destination while others must divert and rent cars to get there could be a wise investment. Eventually, however, the answer will probably be yes, since advanced Rnav and RNP are unquestionably the way of the future for most of us. —J.S.