

**Before the United State House of Representatives  
Committee on Transportation and Infrastructure  
Subcommittee on Aviation**

**Testimony of Brad Thomann**

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**Hearing on NextGen: Area Navigation (RNAV)/Required Navigation Performance (RNP)**

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**About Jeppesen**

Jeppesen has a rich history in aviation that goes back to Captain Elrey B. Jeppesen who designed and produced aeronautical charts that would become the industry standard. Jeppesen learned to fly in 1927 and earned his pilot's license, signed by Orville Wright. During the winters of 1930 and '31 when he was an airmail pilot, many of his fellow pilots perished because there was no published aeronautical information. This started him on a lifelong endeavor to improve the safety of air navigation by conducting aerial surveys, creating aeronautical charts and establishing the first flight procedures that pilots could use to navigate in poor visibility. He founded Jeppesen & Company in 1934 and, for the past 75 years, pilots and airlines around the world have depended on Jeppesen for timely, accurate, and thorough flight information.

Today, those initial paper chart products have evolved into a variety of digital navigation solutions for pilots and airlines. Jeppesen is unsurpassed in the aviation industry for providing products, services and training that meet current needs, and for developing technologies to meet future needs for all segments of aviation. In addition to its aviation leadership, Jeppesen also provides essential navigational and logistical products and services to sea and rail operations across the globe. Jeppesen is a subsidiary of Boeing Commercial Aviation Services, a unit of Boeing Commercial Airplanes.

Jeppesen has been analyzing airspace and designing all types of procedures for over nine years and RNP procedures for five years. This includes procedures delivered in 15 different countries around the world. Jeppesen's staff of highly trained and experienced personnel is fully capable of designing all types of procedures to both FAA (TERPS) and International Civil Aviation Organization (PANS-OPS) criteria. Recent accomplishments include the creation of 21 RNAV procedures at Beijing and 14 RNP procedures at Linzhi and Lijiang, China. As a third-party

service provider, Jeppesen offers a full suite of RNP-related services, including consulting for operators who wish to get approved for RNP, as well as RNP data validation and flight validation services. In addition, Jeppesen provides aeronautical charts and digital navigation data for on-board navigation equipment to meet the needs of all types of airspace users, from general aviation to the airlines. These chart and navigation data services are essential to efficient, effective use of RNP. U.S. airlines and other airspace users rely heavily on Jeppesen for their navigation solutions, as do operators in countries around the world.

### **What is RNP?**

For decades, flight procedures have been built around ground-based navigation aids (navaids) which have limited flexibility and are expensive to install and maintain. Using ground-based navaids, aircraft are forced to fly from one specific fixed location to another specific fixed location. With the advent of satellite-based navigation, a new type of flexibility was introduced, and procedures are now developed using “points in space” rather than being tied to ground-based navaids. Area Navigation (RNAV) and Required Navigation Performance (RNP) take advantage of this satellite-based technology.

The significance of RNAV is that it enables aircraft to fly on any desired flight path within the coverage of ground- or space-based navigation aids. This provides the freedom to fly more efficient routes between airports as well as more efficient approach paths at the airport.

RNP is RNAV with the addition of an onboard navigational performance monitoring and alerting capability. The defining characteristic of RNP is the ability of the aircraft system to monitor the navigation performance and inform the flight crew whenever the specified navigational accuracy requirement is not met during an operation.

### **Importance of RNP**

The increased level of precision offered by RNP plus its ability to use constant radius curved flight paths provides flexibility in procedure design that can result in a variety of benefits. For example, it is green. RNP enables shorter routes, which reduces fuel usage and emissions, while driving down operating costs. It enables increased airport capacity, helping to mitigate congestion and delays while respecting the noise footprint of the surrounding communities. At some airports, it allows aircraft to land in lower visibility, enhancing the operational reliability for the operator. It also allows for avoidance of specified areas for national security or noise abatement, precise navigation through challenging terrain, and lower approach minimums which reduce diversions in poor weather.

Due to the higher levels of navigational accuracy that RNP brings, ATC separation standards can be adjusted to allow aircraft to fly closer to each other, which can increase capacity without sacrifice of current safety levels and requirements. RNP also brings higher levels of repeatability of flown flight path to the flight operation within the terminal airspace. Workloads on ATC controllers may be reduced due to less radar vectoring and predictable flight paths, resulting in fewer radio transmissions. Another benefit of RNP is the ability to use curved flight paths, which allow precision navigation in situations where the traditional straight flight paths cannot be used. These curved paths are important elements in serving airports which are located in challenging terrain, because they decrease the controlled flight into terrain probability. The use

of curved flight paths is also advantageous to airports which have complex noise abatement requirements or which require very flexible navigation paths to avoid areas where there are flight restrictions such as in the area of the White House.

With the United States currently in the process of transforming its National Airspace System to meet the challenges of the 21st century through NextGen, there must be a fundamental change in philosophy by moving away from legacy ground-based navigation systems to performance-based navigation. In this new system, operators will navigate through our Nation's airspace according to pre-determined performance criteria rather than being rigidly held to specific avionics equipment. RNP is an important foundational element of this concept.

Even before NextGen capabilities are fully in place, RNP is a very attractive means of navigation for airspace users due to all the benefits mentioned earlier. While airlines led the way with RNP, business and general aviation are increasingly interested in utilizing the performance capabilities as well.

### **Current Status**

To date, the FAA has provided roughly 140 RNP procedures at 42 airports around the United States. Airspace users feel that some of these procedures do not provide the desired operational benefits, such as reductions in flight time, increases in capacity or lower approach minimums. Even if a selected procedure offers benefits in one or more of these areas, the usability of the procedure may be affected by aircraft, aircrew or air traffic control readiness at that location. Airspace users are calling for a substantial increase in introduction of new RNP procedures at locations which offer specific operational benefits, and where aircraft, aircrew and ATC are in a position to take advantage of these procedures.

To meet airspace user requirements for increased levels of capacity, efficiency, and safety the FAA will need to do several things to accelerate RNP implementation.

First, the FAA needs to make the commitment to move forward with RNP as the primary means of operations for the NAS and develop an aggressive implementation plan for RNP in all phases of flight. While RNP is recognized as a foundational element of NextGen, the transition plan to achieve this has not been adequately focused and resourced to accomplish the necessary safety assessments and operational implementation designs (For example, determining the adequate spacing between RNP tracks and allowing RNP approaches to be established on lateral approach tracks). Without this work on operational approvals, we will be unable to move beyond procedures that simply overlay today's flight paths or provide separation from terrain and fail to achieve the full potential of RNP.

Second, the FAA will need to supplement its capacity to develop procedures. This can be done through use of carefully selected and approved procedure design suppliers who can help fulfill this need. The FAA's program for 3<sup>rd</sup> Party RNP Other Transactional Authority (OTA) was designed for this purpose and ensures that only highly qualified companies can help with RNP procedure design. Jeppesen has consistently demonstrated to the FAA all of the necessary requirements for OTA certification, including our strong ATC experience, which helps ensure acceptance of procedures by air traffic controllers. Jeppesen and other like third-party providers

can successfully complement the work that the FAA does in RNP procedure design by providing shorter to-market time for RNP procedures, allowing customers to reap the benefits of RNP more quickly and to meet the needs of NextGen.

### **Procedure Maintenance**

The FAA has a long history of managing both procedure design and ongoing maintenance of those procedures. Currently FAA averages around 500 to 600 new or revised procedures per 56-day cycle. Ongoing surveillance and maintenance requires scrutiny of a variety of factors that can result in a procedure revision. This is a very large and complex task. The FAA has developed a core competency for this. While the OTA specifies that the private provider will conduct this ongoing maintenance, Jeppesen feels that task should reside with the FAA so there is a single source of knowledge about every public procedure in the national airspace system. This would allow a balance between the government role and that of private industry. In many countries around the world, the aviation authorities and air navigation service providers (ANSPs) contract with external companies for initial procedure design, then bring the ongoing surveillance and maintenance of those procedures inside, under the responsibility of the aviation authority or ANSP. Jeppesen feels the FAA should consider this model. The OTA third-party RNP authorization could help them select well-qualified companies for creation of the initial procedures, helping the FAA to increase capacity as needed.

### **Summary**

RNP is an important element of NextGen. It provides flexibility in procedure design that enables shorter routes, increased capacity, precise navigation through challenging terrain and fewer diversions in poor weather. It can help to increase capacity, bring higher levels of repeatability of flown flight paths and reduce ATC workloads. It allows the use of curved flight paths, which is important for airports located in challenging terrain that have complex noise abatement requirements or are in areas with significant flight restrictions.

Currently, airspace users feel that the FAA is not publishing enough new RNP procedures to meet requirements for increased levels of efficiency. To meet these requirements, the FAA will need to enhance its implementation efforts to gain approval of advanced RNP operations and supplement its procedure development capacity by using highly qualified procedure design suppliers. The FAA has a system in place to allow these suppliers to increase the availability of RNP procedures. Once the procedures are established, the FAA should retain ongoing surveillance and maintenance of the procedures, since it has a core competency in this discipline. This will provide one knowledge source for every public procedure.

By implementing these suggestions, the FAA can increase the capacity, efficiency and safety of NAS operations..