

**[4910-13]**

**DEPARTMENT OF TRANSPORTATION**

**Federal Aviation Administration**

**14 CFR Part 91**

**[Docket No. FAA-2007-29305; Notice No. 07-15]**

**RIN 2120-AI92**

**Automatic Dependent Surveillance – Broadcast (ADS-B) Out performance requirements to support Air Traffic Control (ATC) service**

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Notice of availability.

**SUMMARY:** This notice announces the availability of a revised Initial Regulatory Flexibility Analysis associated with the notice of proposed rulemaking entitled, “Automatic Dependent Surveillance—Broadcast (ADS-B) Out performance requirements to support Air Traffic Control (ATC) service.

**DATES:** The comment period for the Notice of Proposed Rulemaking (NPRM) published on October 5, 2007 (72 FR 56947) closes March 3, 2008.

**ADDRESSES:** You may send comments identified by Docket Number FAA-2007-29305 using any of the following methods:

- Federal eRulemaking Portal: Go to <http://www.regulations.gov> and follow the instructions for sending your comments electronically.
- Mail: Send comments to Docket Operations, M-30, U.S. Department of Transportation, 1200 New Jersey Avenue, SE, West Building Ground Floor, Room W12-140, Washington, DC 20590.

- Fax: Fax comments to Docket Operations at 202-493-2251.
- Hand Delivery: Bring comments to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

For more information on the rulemaking process, see the SUPPLEMENTARY INFORMATION section of this document.

*Privacy:* We will post all comments we receive, without change, to <http://www.regulations.gov>, including any personal information you provide. Using the search function of our docket web site, anyone can find and read the comments received into any of our dockets, including the name of the individual sending the comment (or signing the comment for an association, business, labor union, etc.). You may review DOT's complete Privacy Act Statement in the Federal Register published on April 11, 2000 (65 FR 19477-78) or you may visit <http://DocketsInfo.dot.gov>.

*Docket:* To read background documents or comments received, go to <http://www.regulations.gov> at any time or to Docket Operations in Room W12-140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE, Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

**FOR FURTHER INFORMATION CONTACT:** Thomas C. Smith, Regulatory Analysis Division, Office of Aviation Policy and Plans, APO-310, Federal Aviation Administration, 800 Independence Ave., SW, Washington, DC 20591; telephone number: (202) 267-3289; [thomas.c.smith@faa.gov](mailto:thomas.c.smith@faa.gov).

## **SUPPLEMENTARY INFORMATION**

### **Availability of Rulemaking Documents**

You can get an electronic copy of rulemaking documents using the Internet by—

1. Searching the Federal eRulemaking Portal (<http://www.regulations.gov>);
2. Visiting the FAA’s Regulations and Policies web page at [http://www.faa.gov/regulations\\_policies/](http://www.faa.gov/regulations_policies/); or
3. Accessing the Government Printing Office’s web page at <http://www.gpoaccess.gov/fr/index.html>.

You can also get a copy by sending a request to the Federal Aviation Administration, Office of Rulemaking, ARM-1, 800 Independence Avenue S.W, Washington, DC 20591, or by calling (202) 267-9680. Make sure to identify the docket number, notice number, or amendment number of this rulemaking.

### **Discussion**

On October 1, 2007, the Federal Aviation Administration (FAA) issued a notice of proposed rulemaking (NPRM) entitled, “Automatic Dependent Surveillance – Broadcast (ADS-B) Out performance requirements to support Air Traffic Control (ATC) service” (72 FR 56947; October 5, 2007). The comment period for the NPRM closes on March 3, 2007.

The Small Business Administration’s (SBA) Office of Advocacy has asked us to revise the Initial Regulatory Flexibility Analysis (IRFA) associated with the NPRM and to publish the revised IRFA in the Federal Register.<sup>1</sup> Specifically, the SBA was concerned that two tables that we included in the IRFA might be misleading. The tables

listed specific data on a sample of 34 U.S. part 91, 121, and 135 operators. We used data from the sample along with Census Bureau data to extrapolate the number of small entities in the U.S. that might be significantly affected by the proposed rule. We then concluded that the proposal would have a significant effect on a substantial number of small entities.

The SBA was concerned that inclusion of this table would cause companies to mistakenly conclude that the proposed rule would only have a significant impact on those companies that were listed. That conclusion would be erroneous because the companies on the list were only used as a sample from which to extrapolate to the rest of the industry. Therefore, we changed the IRFA by removing the tables and better explaining how we derived our results.

The analysis examines whether the proposed rulemaking would have a significant economic impact on a substantial number of small entities.

## **Initial Regulatory Flexibility Determination ADS-B**

### **Introduction and Purpose of this Analysis**

The Regulatory Flexibility Act of 1980 (Public Law 96-354) (RFA) establishes “as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration.” The RFA covers a wide-

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<sup>1</sup> The original IRFA can be found in the FAA’s Draft Regulatory Impact Analysis, Document ID FAA-

range of small entities, including small businesses, not-for-profit organizations, and small governmental jurisdictions.

Agencies must perform a review to determine whether a rule will have a significant economic impact on a substantial number of small entities. If the agency determines that it will, the agency must prepare a regulatory flexibility analysis as described in the RFA. However, if an agency determines that a proposed or final rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 1980 RFA provides that the head of the agency may so certify and a regulatory flexibility analysis is not required. The certification must include a statement providing the factual basis for this determination, and the reasoning should be clear.

The FAA believes that this proposal would result in a significant economic impact on a substantial number of small entities. The purpose of this analysis is to provide the reasoning underlying the FAA determination.

Under Section 603(b) of the RFA, the analysis must address:

- Description of reasons the agency is considering the action,
- Statement of the legal basis and objectives for the proposed rule,
- Description of the record keeping and other compliance requirements of the proposed rule,
- All federal rules that may duplicate, overlap, or conflict with the proposed rule,
- Description and an estimated number of small entities to which the proposed rule will apply,

- Analysis of small firms' ability to afford the proposed rule,
- Estimation of the potential for business closures,
- Conduct a competitive analysis,
- Conduct a disproportionality analysis, and
- Describe the alternatives considered.

### **Reasons Why the Rule is Being Proposed**

Public Law 108-176, referred to as “The Century of Aviation Reauthorization Act,” was enacted December 12, 2003 (Pub. L. 108-176). This law set forth requirements and objectives for transforming the air transportation system to progress further into the 21<sup>st</sup> Century. Section 709 of this statute requires the Secretary of Transportation to establish in the FAA a joint planning and development office (JPDO) to manage work related to the Next Generation Air Transportation System (NextGen). Among its statutorily defined responsibilities, the JPDO coordinates the development and utilization of new technologies to ensure that when available, they may be used to the fullest potential in aircraft and in the air traffic control system.

The FAA, the National Aeronautics and Space Administration (NASA) and the Departments of Commerce, Defense, and Homeland Security have launched an effort to align their resources to develop and further the NextGen. The goals of NextGen, as stated in section 709, are addressed by this proposal and include:

(1) improve the level of safety, security, efficiency, quality, and affordability of the NAS and aviation services;

(2) take advantage of data from emerging ground-based and space-based communications, navigation, and surveillance technologies;

(3) be scalable to accommodate and encourage substantial growth in domestic and international transportation and anticipating and accommodating continuing technology upgrades and advances; and

(4) accommodate a wide range of aircraft operations, including airlines, air taxis, helicopters, general aviation, and unmanned aerial vehicles.

The JPDO was also charged to create and carry out an integrated plan for NextGen. The NextGen Integrated Plan,<sup>2</sup> transmitted to Congress on December 12, 2004, ensures that the NextGen system meets the air transportation safety, security, mobility, efficiency and capacity needs beyond those currently included in the FAA's Operational Evolution Plan (OEP). As described in the NextGen Integrated Plan, the current approach to air transportation, i.e., ground based radars tracking congested flyways and passing information among the control centers for the duration of the flights, is becoming operationally obsolete. The current system is increasingly inefficient and large increases in air traffic will only result in mounting delays or limitations in service for many areas.

This growth will result in more air traffic than the present system can handle. The current method of handling traffic flow will not be able to adapt to the highest volume and density of it in the future. It is not only the number of flights but also the nature of the new growth that is problematic, as the future of aviation will be much more diverse than it is today. For example, a shift of two percent of today's commercial passengers to micro-jets that seat four-six passengers would result in triple the number of flights in order to carry the same number of passengers. Furthermore, the challenges grow as other

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<sup>2</sup>A copy of the Plan has been placed in the docket for this rulemaking.

non-conventional aircraft, such as unmanned aircraft, are developed for special operations, e.g. forest fire fighting.

The FAA believes that ADS-B technology is a key component in achieving many of the goals set forth in the plan. This proposed rule embraces a new approach to surveillance that can lead to greater and more efficient utilization of airspace. The NextGen Integrated Plan articulates several large transformation strategies in its roadmap to successfully creating the Next Generation System. This proposal is a major step toward strategically “establishing an agile air traffic system that accommodates future requirements and readily responds to shifts in demand from all users.” ADS-B technology would assist in the transition to a system with less dependence on ground infrastructure and facilities, and provide for more efficient use of airspace.

### **Statement of the Legal Basis and Objectives**

The FAA’s authority to issue rules regarding aviation safety is found in Title 49 of the United States Code. Subtitle I, Section 106 describes the authority of the FAA Administrator. Subtitle VII, Aviation Programs, describes in more detail the scope of the agency’s authority.

This rulemaking is promulgated under the authority described in Subtitle VII, Part A, Subpart I, Section 40103, Sovereignty and use of airspace, and Subpart III, section 44701, General requirements. Under section 40103, the FAA is charged with prescribing regulations on the flight of aircraft, including regulations on safe altitudes, navigating, protecting, and identifying aircraft, and the safe and efficient use of the navigable airspace. Under section 44701, the FAA is charged with promoting safe flight of civil

aircraft in air commerce by prescribing regulations for practices, methods, and procedures the Administrator finds necessary for safety in air commerce.

This proposal is within the scope of sections 40103 and 44701 since it proposes aircraft performance requirements that would meet advanced surveillance needs to accommodate the projected increase in operations within the National Airspace System (NAS). As more aircraft operate within the U.S. airspace, improved surveillance performance is necessary to continue to balance the growth in air transportation with the agency's mandate for a safe and efficient air transportation system.

### **Projected Reporting, Record Keeping and Other Requirements**

We expect no more than minimal new reporting and record-keeping compliance requirements to result from this proposed rule. Costs for the initial installation of new equipment and associated labor constitute a burden under the Paperwork Reduction Act. The Paperwork Reduction Act analysis was included in the full Regulatory Analysis that is included in the docket for this rulemaking. .

### **Overlapping, Duplicative, or Conflicting Federal Rules**

We are unaware that the proposed rule will overlap, duplicate or conflict with existing Federal Rules.

### **Estimated Number of Small Firms Potentially Impacted**

Under the RFA, the FAA must determine whether a proposed rule significantly affects a substantial number of small entities. This determination is typically based on small entity size and cost thresholds that vary depending on the affected industry.

Using the size standards from the Small Business Administration for Air Transportation and Aircraft Manufacturing, we defined companies as small entities if they have fewer than 1,500 employees.<sup>3</sup>

This proposed rule would become final in 2009 and fully effective in 2020. Although the FAA forecasts traffic and air carrier fleets to 2030, our forecasts do not have the granularity to determine if an operator will likely still be in business or will still remain a small business entity. Therefore we will use current U.S. operator's fleet and employment in order to determine the number of operators this proposal would affect.

We obtained a list of part 91, 121 and 135 U.S. operators from the FAA Flight Standards Service.<sup>4</sup> Using information provided by the U.S. Department of Transportation Form 41 filings, World Aviation Directory and ReferenceUSA, operators that are subsidiary businesses of larger businesses and businesses with more than 1,500 employees were eliminated from the list of small entities. In many cases the employment and annual revenue data was not public and we did not include these companies in our analysis. For the remaining businesses, we obtained company revenue and employment from the above three sources.

The methodology discussed above resulted in a sample of 34 U.S. part 91, 121 and 135 operators, with less than 1,500 employees, who operate 341 airplanes. Due to the sparse amount of publicly available data on internal company financial statistics for small entities, it is not feasible to estimate the total population of small entities affected by this proposed rule. These 34 U.S. small entity operators are a representative sample to assess

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<sup>3</sup>13 CFR Part 121.201, Size Standards Used to Define Small Business Concerns, Sector 48-49 Transportation, Subsector 481 Air Transportation

<sup>4</sup> AFS-260

the cost impact of the total population of small businesses, who operate aircraft affected by this proposed rulemaking. This representative sample was then applied to the U.S. Census Bureau data on the Small Business Administration's website to develop an estimate of the total number of affected small business entities. The U.S. Census Bureau data lists small entities in the Air Transportation Industry that employ less than 500 employees. Other small businesses may own aircraft and not be included in the U.S. Census Bureau Air Transportation Industry category. Therefore our estimate of the number of affected small entities affected by this proposed rulemaking will likely be understated. The estimate of the total number of affected small entities is developed below.

### **Cost and Affordability for Small Entities**

To assess the cost impact to small business part 91, 121 and 135 operators, we contacted manufacturers, industry associations, and ADS-B equipage providers to estimate ADS-B equipage costs. We requested estimates of airborne installation costs, by aircraft model, for the output parameters listed in the Equipment Specifications section of the Regulatory Evaluation.

To satisfy the manufacturer's request to keep individual aircraft pricing confidential, we calculated a low, baseline, and high range of costs by equipment class. The baseline estimate equals the average of the low and high industry estimates. The dollar value ranges consist of a wide variety of avionics within each aircraft group. The aircraft architecture within each equipment group can vary, causing different carriage, labor and wiring requirements for the installation of ADS-B. Volume discounting versus single line purchasing also affects the dollar value ranges. On the low end, the dollar value may represent a software upgrade or OEM option

change. On the high end, the dollar value may represent a new installation of upgraded transponder systems necessary to assure accuracy, reliability and safety. We used the estimated baseline dollar value cost by equipment class in determining the impact to small business entities.

We estimated each operator's total compliance cost by multiplying the baseline dollar value cost, by equipment class, by the number of aircraft each small business operator currently has in its fleet. We summed these costs by equipment class and group. We then measured the economic impact on small entities by dividing the estimated baseline dollar value compliance cost for their fleet by the small entity's annual revenue. Each equipment group operated by a small entity may have to comply with different requirements in the proposed rule depending on the state of the aircraft's avionics. In the [ADS-B Out Equipage Cost Estimate](#) section of the Regulatory Evaluation we detail our methodology to estimate operators' total compliance cost by equipment group.

The ADS-B cost is estimated to be greater than two percent of annual revenues for about 35 percent and greater than one percent of annual revenues for about 54 percent of the small entity operators in our sample population of 34 small aviation entities. Applying these percentages to the 2,719 firms with employment under 500 from the Air Transportation Industry category of the U.S. Census Bureau data<sup>5</sup> results in the estimated ADS-B cost being greater than two percent of annual revenues for at least 960 small entities and greater than one percent of annual revenues for at least 1,476 small entity operators.

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<sup>5</sup> [http://www.sba.gov/advo/research/us04\\_n6.pdf](http://www.sba.gov/advo/research/us04_n6.pdf)

Thus the FAA has determined that a substantial number of small entities would be significantly affected by the proposed rule. Every small entity who operates an aircraft in the airspace defined by this proposal would be required to install ADS-B out equipage and therefore would be affected by this rulemaking.

### **Business Closure Analysis**

For commercial operators, the ratio of present-value costs to annual revenue shows that seven of 34 small business air operator firms analyzed would have ratios in excess of five percent. Since many of the other commercial small business air operator firms do not make their annual revenue publicly available, it is difficult to assess the financial impact of this proposed rule on their business. To fully assess whether this proposed rule could force a small entity into bankruptcy requires more financial information than is publicly available.

The FAA seeks comment, with supportive justification, to determine the degree of hardship, and feasible alternative methods of compliance, the proposed rule will have on these small entities.

### **Competitive Analysis**

The aviation industry is an extremely competitive industry with slim profit margins. The number of operators who entered the industry and have stopped operations because of mergers, acquisitions, or bankruptcy litters the history of the aviation industry.

The FAA analyzed five years of operating profits for the affected small-entity operators listed above. We were able to determine the operating profit for 18 of the 34 small business entities. The FAA discovered that 33 percent of these 18 affected

operator's average operating profit is negative. Only four of the 18 affected operators had average annual operating profit that exceeded \$10,000,000.

In this competitive industry, cost increases imposed by this proposed regulation would be hard to recover by raising prices, especially by those operators showing an average five-year negative operating profit. Further, large operators may be able to negotiate better pricing from outside firms for inspections and repairs, so small operators may need to raise their prices more than large operators. These factors make it difficult for the small operators to recover their compliance costs by raising prices. If small operators cannot recover all the additional costs imposed by this regulation, market shares could shift to the large operators.

However, small operators successfully compete in the aviation industry by providing unique services and controlling costs. To the extent the affected small entities operate in niche markets enhances small entity's ability to pass on costs. Currently small operators are much more profitable than the established major scheduled carriers. This proposed rule would offset some of the advantages that these small operators have of using older aircraft that have lower capital cost.

Overall, in terms of competition, this rulemaking reduces small operators ability to compete. We request comments from industry on the results of the competitive analysis.

### **Disproportionality Analysis**

The disproportionately higher impact of the proposed rule on the fleets of small operators result in higher relative costs to small operators. Due to the potential of fleet discounts, large operators may be able to negotiate better pricing from outside sources for inspections, installation, and ADS-B hardware purchases.

Based on the percent of potentially affected current airplanes over the analysis period, small U.S. business operators may bear a disproportionate impact from the proposed rule.

Comments received and final rule changes on regulatory flexibility issues will be addressed in the statement of considerations for the final rule.

## **Analysis of Alternatives**

### ***Alternative One***

The status quo alternative has compliance costs to continue the operation and commissioning of radar sites. The FAA rejected this status quo alternative because the ground based radars tracking congested flyways and passing information among the control centers for the duration of the flights is becoming operationally obsolete. The current system is not efficient enough to accommodate the estimated increases in air traffic, which would result in mounting delays or limitations in service for many areas.

### ***Alternative Two***

This alternative would employ a technology called multilateration. Multilateration is a separate type of secondary surveillance system that is not radar and has limited deployment in the U.S. At a minimum, multilateration requires upwards of four ground stations to deliver the same volume of coverage and integrity of information as ADS-B, due to the need to "triangulate" the aircraft's position. Multilateration is a process wherein an aircraft position is determined using the difference in time of arrival of a signal from an aircraft at a series of receivers on the ground. Multilateration meets the need for accurate surveillance and is less costly than ADS-B (but more costly than radar), but cannot achieve the same level of benefits that ADS-B can. Multilateration

would provide the same benefits as radar, but we estimate that cost to provide multilateration (including the cost to sustain radar until multilateration is operational), would exceed the cost to continue full radar surveillance .<sup>6</sup>

### ***Alternative Three***

This alternative would provide relief by having the FAA provide an exemption to small air carriers from all requirements of this rule. This alternative would mean that the small air carriers would rely on the status quo ground based radars tracking their flights and passing information among the control centers for the duration of the flights. This alternative would require compliance costs to continue for the commissioning of radar sites. Air traffic controller workload and training costs would increase having to employ two systems in tracking aircraft. Small entities may request ATC deviations prior to operating in the airspace affected by this proposal. It would also be contrary to our policy for one level of safety in part 121 operations to exclude certain operators simply because they are small entities. Thus, this alternative is not considered to be acceptable.

### ***Alternative Four***

This alternative is the proposed ADS-B rule. ADS-B does not employ different classes of receiving equipment or provide different information based on its location. Therefore, controllers will not have to account for transitions between surveillance solutions as an aircraft moves closer or farther away from an airport. In order to meet future demand for air travel without significant delays or denial of service, ADS-B was found to be the most cost effective solution to maintain a viable air transportation system.

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<sup>6</sup> However, the cost to operate and maintain the multilateration facilities and equipment is less than the cost to continue full radar surveillance.

ADS-B provides a wider range of services to aircraft users and could enable applications unavailable to multilateration or radar.

### **Trade Impact Assessment**

The Trade Agreements Act of 1979 (Public Law 96-39) prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Legitimate domestic objectives, such as safety, are not considered unnecessary obstacles. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards.

ICAO is developing a set of standards that are influenced by, and similar to, the U.S. RTCA developed standards. Initial discussions with the international community lead us to conclude that U.S. aircraft operating in foreign airspace would not have to add any equipment or incur any costs in addition to what they would incur to operate in domestic airspace under this proposed rulemaking. Foreign operators may incur additional costs to operate in U.S. airspace, if their national rules, standards and, current level of equipage are different than those required by this proposed rule. The FAA is actively engaged with the international community to ensure that the international and US. ADS-B standards are as compatible as possible. For a fuller discussion of what other countries are planning with regards to ADS-B, see Section VII of the preamble. By 2020 ICAO standards may change to harmonize with this proposed rule and foreign operators will not have to incur additional costs.

## **Unfunded Mandates Assessment**

Title II of the Unfunded Mandates Reform Act of 1995 (Public Law 104-4) requires each Federal agency to prepare a written statement assessing the effects of any Federal mandate in a proposed or final agency rule that may result in an expenditure of \$100 million or more (adjusted annually for inflation with the base year 1995) in any one year by State, local, and tribal governments, in the aggregate, or by the private sector; such a mandate is deemed to be a “significant regulatory action.” The FAA currently uses an inflation-adjusted value of \$128.1 million in lieu of \$100 million. This proposed rule is not expected to impose significant costs on small governmental jurisdictions such as state, local, or tribal governments but the FAA calls for comment on whether this expectation is correct. However, this proposed rule would result in an unfunded mandate because it would result in expenditures in excess of an inflation-adjusted value of \$128.1 million. We have considered three alternatives to this rulemaking, which are discussed in section 4.0 and in the regulatory flexibility analysis in section 7.

Issued in Washington, DC on

Pamela Hamilton-Powell  
Director, Office of Rulemaking