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**14 CFR Part 108
Explosives Detection Systems for
Checked Baggage; Final Rule**

DEPARTMENT OF TRANSPORTATION**Federal Aviation Administration****14 CFR Part 108**

[Docket No. 25956; Amdt. No. 108-7]

RIN 2120-AD12

Explosives Detection Systems for Checked Baggage**AGENCY:** Federal Aviation Administration, DOT.**ACTION:** Final rule.

SUMMARY: The Federal Aviation Administration is amending the airplane operator security regulations to require U.S. air carriers to use explosives detection systems to screen checked baggage for international flights in accordance with their respective approved security programs. This action is intended to protect passengers and crewmembers from acts of sabotage directed against civil aviation and is responsive to recent legislation.

EFFECTIVE DATE: October 5, 1989.

ADDRESSES: The complete docket for this rule, including the Regulatory Impact Analysis, may be examined at the Federal Aviation Administration, Rules Docket (AGC-10), Room 915-G, 800 Independence Ave. SW., Washington, DC 20591, between 8:30 a.m. and 5 p.m. weekdays, except Federal holidays.

For copies of performance criteria and implementation procedures for explosives detection systems, prospective manufacturers may write to the Federal Aviation Administration, Director of Civil Aviation Security (Attn: ACS-200), 800 Independence Ave. SW., Washington, DC 20591.

FOR FURTHER INFORMATION CONTACT: Quinten T. Johnson, Civil Aviation Security Division (ACS-100), Office of Civil Aviation Security, Federal Aviation Administration, 800 Independence Avenue SW., Washington, DC 20591; telephone (202) 267-8058.

SUPPLEMENTARY INFORMATION:**Introduction**

On July 6, 1989, the Federal Aviation Administration (FAA) issued a Notice of Proposed Rulemaking (NPRM) to amend part 108 of the Federal Aviation Regulations (FAR) to require certain U.S. air carriers to use explosives detection systems (EDS's) to screen checked baggage on international flights in accordance with their respective security programs (54 FR 28985, July 10, 1989). This regulation was proposed on the FAA's own initiative and in

response to legislation because attacks against international civil aviation have increased in sophistication over the past decade. In recent years, explosive devices have been used to damage or destroy civilian aircraft resulting in the loss of many lives. For example, 259 people on board Pan American World Airways (Pan Am) Flight 103 plus 11 people on the ground in Lockerbie, Scotland, were killed by an explosion aboard that flight in December 1988. As a result of such incidents, security has become a greater concern of the aviation community, and more sophisticated measures are required to prevent recurrences of such incidents. Therefore, the regulation requiring U.S. air carriers to use EDS's to screen checked baggage for international flights in accordance with their respective security programs is adopted as final.

Background

FAR Part 108, promulgated in 1981 (46 FR 3782, January 15, 1981), is part of the FAA's Civil Aviation Security Program initiated in 1973. Section 108.9 requires certain U.S. carriers to conduct security screening of passengers and their baggage "to prevent or deter the carriage aboard airplanes of any explosive, incendiary, or deadly or dangerous weapon on or about each individual's person or accessible property, and the carriage of any explosive or incendiary in checked baggage."

For many years, this screening program was effective in countering the threat to domestic and international civil aviation, which came primarily from hijackers. In recent years an additional threat has come from persons seeking to bomb or sabotage aircraft. To counter this threat, improved methods of detecting explosives are needed.

The U.S. Government has actively supported research and development in explosives detection. For example, between fiscal years 1982 and 1989, the FAA spent over \$47 million on vapor detection and thermal neutron analysis equipment alone. In February 1989, the International Civil Aviation Organization (ICAO) convened a special session of its Council to discuss acts of sabotage directed against civil aviation and the need to expedite research and development on the detection of explosives. In March 1989, the ICAO held a meeting of world experts in explosives detection to address the issue. Similar discussions have taken place in European organizations as well.

The FAA has tested several explosives detection systems and has purchased six Thermal Neutron Analysis (TNA) units for initial

installation at selected airports. These units detect explosives using Californium-252 as a thermal neutron emitter to activate nitrogen atoms. Testing was performed over a period of several months during 1987 and 1988 at Los Angeles International and San Francisco International Airports. During these testing periods, over 40,000 actual passenger bags were subjected to TNA screening. This operational experience demonstrated that TNA is one technology that can be successfully deployed for the detection of explosives.

After the destruction of Pan Am Flight 103, the FAA conducted a comprehensive review of security procedures to determine where improvements or new procedures were needed. On April 3, 1989, Secretary of Transportation Samuel K. Skinner announced a number of aviation security initiatives. Among the most significant of these was the deployment of explosives detection systems being addressed in this rule, and the establishment of a Security Directive and Information Circular system, for which a regulation was promulgated on July 10, 1989 (54 FR 28982; July 10, 1989).

There has also been substantial Congressional interest in improving aviation security. One Congressional response was legislation (Pub. L. 101-45), signed by the President on June 30, 1989, that directs the FAA to require EDS's at airports where the Administrator of the Federal Aviation Administration determines the use of EDS's is necessary. This legislation provided that—

Not later than thirty days after the date of the enactment of this Act, the Federal Aviation Administrator shall initiate action, including such rulemaking or other actions as necessary, to require the use of explosive detection equipment that meets minimum performance standards requiring application of technology equivalent to or better than thermal neutron analysis technology at such airports (whether located within or outside the United States) as the Administrator determines that the installation and use of such equipment is necessary to ensure the safety of air commerce. The Administrator shall complete these actions within sixty days of enactment of this Act[.]

Discussion of the Proposed Regulation

In its July 6, 1989, proposed rule, the FAA requested comments on three alternative plans for deploying EDS's. The alternatives identified in the NPRM were as follows:

I. Domestic and International Alternative—Install EDS's at 427 airports in the United States and 95 foreign airports over a 10-year phase-in period (100% checked baggage screening

of domestic and U.S. international flights, eventually requiring 1,250 EDS's by 1999).

II. International Alternative—Install only enough EDS's to screen U.S. carrier international flights at domestic and foreign airports over a three year phase-in period (100% checked baggage screening of all U.S. international flights, eventually requiring 400 EDS's by 1999).

III. Threat-Driven Alternative—Install 200 EDS's at an unspecified number of domestic and foreign airports over a three year phase-in period, based on the need to counter threats (100% checked baggage screening of all international flights at selected airports, eventually requiring 270 EDS's by 1999).

The FAA stated that, while comments were welcome on the feasibility of all three alternatives, it was proposing Alternative II. It proposed that for international flights each air carrier conducting screening under an approved security program use an EDS that has been approved by the Administrator to screen checked baggage. This proposal would enable the FAA to require air carriers to use EDS's for all international flights.

Thus, in the proposed rule, the FAA sought the authority to require EDS's for all international operations through subsequent amendments to each air carrier's security program, although initial deployment of EDS's would be limited to approximately 40 airports. The FAA stated that before extending EDS requirements to international locations beyond the initial deployment, it would consider a variety of factors such as successful consultation with foreign governments, level of vulnerability at the particular location, and the projected level of usage. The FAA also stated that it would look closely at benefits and costs.

Discussion of Comments

The FAA received comments from 28 individuals and organizations. Although the proposed rule addressed only the screening of international baggage, the FAA also invited comments on the feasibility of either requiring EDS's for domestic operations or requiring EDS's on a threat-driven basis. Several other issues were also raised by commenters, the major points of which are discussed below.

Domestic Application

Most commenters oppose any requirement for EDS's for domestic operations because, they believe, there is no significant domestic threat. In the absence of identifiable threat, they believe, the cost of these proposed systems is not warranted. The FAA

believes the current level of threat to domestic operations does not require EDS screening and that current security practices for countering threats to domestic operations are adequate. Therefore, the FAA intends to limit the scope of the rulemaking to international flights as originally proposed. The FAA will continue to review all threats against civil aviation, both domestic and foreign, and will take action to require use of EDS's for domestic operations if warranted. In the meantime, if there were a threat against a specific domestic flight at a specific airport that has an EDS in operation, the FAA would take that EDS into account when developing appropriate countermeasures.

Threat-Driven Approach

Some commenters believe that the practice of using EDS's only where known threats exist would satisfy the Congressional mandate in Public Law 101-45 and that carrier flights not operating from high threat locations would then be spared the expense of using an EDS to screen checked baggage. One commenter said that if terrorists didn't know where EDS's are, this approach would deter criminal acts. Other commenters said that the FAA should use mobile EDS's to counter site- or time-specific threats. The FAA believes that the value of widescale use of EDS's is in their general deterrence and not simply in response to specific threats. Moreover, the FAA does not believe it is presently feasible to employ mobile EDS's because of the large size of the EDS equipment currently available and because of the long lead times needed to acquire, install, and operate EDS's. However, as indicated elsewhere in this preamble, the FAA will carefully evaluate where to require the use of EDS's.

Cost

Some commenters believe that the FAA underestimated the costs of acquiring and operating EDS's. While some comments could not be evaluated because of lack of supporting data on underlying assumptions, the FAA acknowledges that a number of points raised by the comments are valid and has made adjustments in the cost estimates. The final rule cost estimates are considerably higher than those identified in the NPRM. The revised cost estimates, addressing such factors as cost of structures to house EDS's, number of systems needed, operator training, and maintenance are discussed later in this preamble under "Regulatory Impact Analysis Summary." The Regulatory Impact Analysis, not

published in the *Federal Register*, is part of the docket for this rule and contains a thorough analysis of costs. It may be examined at the location stated under **ADDRESSES**.

Some commenters express the opinion that the Government should fund implementation of this regulation since, they said, the U.S. Government, not the air carriers, is actually the terrorists' target. The FAA does not agree with commenters who say that the Government should fund EDS's. The FAA notes that the Federal government does not currently fund implementation of other mandatory security programs. The FAA recognizes that this rule will have a cost impact on air carriers, but it is projected to be modest on a per-passenger basis, and the FAA expects air carriers to recover the cost as they would other operational costs.

One commenter expresses concern that small carriers would be competitively disadvantaged in foreign operations if they had to pay for EDS equipment. Furthermore, the commenter points out that the larger carriers would be so overwhelmed by screening their own baggage that they would not be able to serve small carriers. The FAA recognizes that cooperation among air carriers in the use of available EDS equipment is critical to minimize costs and maximize EDS use. The FAA's cost estimates are predicated on cooperation that allows for maximum utilization of EDS equipment. Shared use of EDS equipment is also necessary to permit carriers with relatively low passenger volume from a given location to be competitive. It is expected that, as with other security equipment in the past, air carriers will enter into agreements among themselves to achieve shared use of EDS equipment. If unforeseen problems arise in specific situations, the FAA will work with the carrier involved to address appropriate checked baggage screening procedures.

One commenter suggests that foreign carriers should also be covered by this regulation since many Americans travel on foreign carriers. These travelers, the commenter said, should receive the same protection as those on U.S. carriers. The FAA believes that the aviation security threat is directed primarily at U.S. air carriers and not U.S. citizens per se. Should this situation change, the FAA will reconsider the applicability of the rule. Furthermore, it is important to work through the International Civil Aviation Organization to achieve unified, coordinated, worldwide improvements in aviation security. To this end the FAA is actively working with the member

states of ICAO to prevent and deter threats against all of civil aviation.

The same commenter adds that Americans might find it preferable to use foreign carriers in order to avoid check-in delays, and that this would worsen the trade deficit. The FAA believes it has adequately projected the number of machines that will be required to process passengers based on current check-in procedures and thus does not agree that there will be significant additional delays. In addition, the increased level of security recognized by the traveling public could work to the advantage of those carriers using EDS equipment to screen checked baggage.

Premature Adoption of EDS Requirement

Some commenters believe the FAA would discourage technological development by adopting an EDS rule at this time, since the FAA acknowledges that only one system, TNA, is currently available that can meet the performance criteria. Several commenters express concern that the TNA system is not ready for operational use and is being deployed too rapidly.

Not only has Congress directed the FAA to require explosives detection equipment, the FAA believes there is an urgent need to establish such requirements. The FAA decided to purchase TNA systems because, after operational testing, the TNA system proved to have the highest degree of explosives detection capability currently available. It is the FAA's belief that by implementing the first generation of EDS technology, it is creating an incentive for manufacturers to make technological advances and produce smaller, less costly equipment. Although one commenter advises the FAA to be certain that vendors will be able to produce EDS equipment quickly enough to meet any deployment schedules that may be established through amendments to air carriers' security programs, the FAA believes, based on consultation with the manufacturer of TNA, that there will be an adequate supply of machines. Also, deployment schedules will be subject to the manufacturers' ability to produce the equipment. The FAA recognizes that other systems are in development and welcomes the opportunity to test and approve them when they meet the performance criteria established by the Administrator. The phased-in implementation of EDS technology will facilitate further research and development of alternatives.

The FAA has established the following minimum performance criteria for all EDS's:

1. The systems must be automated.
2. They must detect defined quantities and configurations of FAA-defined explosives.
3. They must be safe for operators and baggage.

Some commenters remark that the FAA should have spelled out the performance criteria and described the method by which the Administrator will approve EDS technology. The rule, however, is not the means by which a manufacturer's equipment is approved; it is an enablement of the FAA to require EDS's. More detailed information about the capabilities, use, compliance dates, locations, and deployment schedules of the system will be incorporated into each air carrier's approved security program. Specific performance criteria will be made available to manufacturers upon request. However, in accordance with § 191.5 of the FAR, the FAA will not publish this information in any document generally available to the public. The Director of Civil Aviation Security has determined that disclosure of this information would be detrimental to the safety of the traveling public. For the same reasons, the specific locations and numbers of EDS units will not be made available to the public. Persons with an operational need to know may write to the Federal Aviation Administration, Director of Civil Aviation Security (Attn: ACS-200), 800 Independence Ave., SW., Washington, DC 20591, for further information.

Another issue raised by commenters is the ability to set TNA equipment to detect small enough levels of explosives to adequately ensure passenger safety. The current performance criteria are reflective of the amounts of various explosives which have been determined to pose a threat.

One commenter points out that the size of the opening of the FAA-purchased TNA precludes oversized bags. It should be noted, however, that the vast majority of passenger bags do fit into the opening of the TNA equipment, and air carriers may contract for different machines with larger openings if they wish. The FAA will address screening procedures for oversize bags in connection with the air carriers' security programs.

Alarm Resolution

Concern has been expressed over how alarms will be handled and the amount of time it will take to clear suspect baggage. Procedures that will take into account the type of threat, limitations on

terminal facilities, availability of law enforcement personnel, and explosives ordnance disposal support will be required under each air carrier's security program. While alarm resolution is not intended to be a wholly automated function of EDS's, as one commenter thinks, procedures appropriate to each type of technology and location will be developed. Alarm resolution may induce some operational difficulties, such as delays for individual passengers being unable to board their flights because of uncleared baggage. These operational difficulties will be addressed jointly by the FAA and the affected air carriers in the individual air carriers' security programs.

Delays

A number of comments address the concern that use of EDS equipment would lead to delays and disruptions. Some of this concern is over alarm resolution (discussed above), and some is related to the logistics of processing large amounts of baggage with a limited number of EDS's. In all locations, the FAA made careful estimates of how many EDS's will be needed to prevent delays at each airport based on the number of flights peaking and locations of the terminals. The FAA believes that EDS screening at foreign airports may actually reduce delays at locations where physical searches are now conducted, especially in Western Europe.

Carry-On Baggage

A few commenters state that carry-on baggage should be subject to EDS screening as well as checked baggage because dupes and suicidal individuals may carry their explosives aboard in hand baggage. While the FAA is actively looking at the carry-on baggage screening process, requiring EDS for carry-on baggage is beyond the scope of this rulemaking. Improvements in carry-on baggage screening requirements have already been instituted in a number of geographic locations, and other improvements are being considered as part of other FAA security initiatives. The FAA will continue to evaluate the feasibility of requiring that EDS screening be applied to carry-on baggage.

Potential Radiation Effects

Some commenters voice concern regarding possible radiation from the use of any EDS that uses a radioactive source. The commenters advise that baggage handlers and the public may suffer ill effects from exposure to the radiation emitted during the decay of

the induced radioactivity, and that the baggage may retain radioactivity after screening. Because of the possible effects of exposure, one commenter has suggested that the National Environmental Policy Act of 1969 requires an environmental impact statement for this rulemaking.

While this final rule regulates air carriers under part 108, it should be noted that the FAA has previously addressed the subject of security equipment in connection with the acquisition of such equipment by airports under part 107 of the Federal Aviation Regulations (14 CFR part 107). Such acquisition has been categorically excluded from environmental assessment under FAA Order 5050.4A, "Airport Environmental Handbook."

With respect to the use of security equipment, the key difference between part 107 and part 108 is that, under part 107 it is the airport that acquires the security equipment for installation and use, whereas under part 108 the air carrier does so. There are no differences between these regulations that suggest that the categorical exclusion under part 107 should not apply with respect to part 108. Nevertheless, because of particular concerns raised regarding EDS's that use radioactive sources, and since the Nuclear Regulatory Commission (NRC) determined that an environmental assessment (EA) was appropriate with respect to its role in licensing EDS's that use radioactive sources, an EA has been prepared to aid of the FAA's response to these docketed comments and has been included in the docket.

As stated in the FAA's EA, the NRC conducted its environmental review in amending the FAA's Materials License (which permits the use of equipment employing thermal neutron activation technology at John F. Kennedy International Airport) to authorize the FAA to install and operate this equipment at other airports. In an "Environmental Assessment and Finding of No Significant Impact" (published in the *Federal Register* at 54 FR 33636; August 15, 1989), the NRC examined the environmental impacts of installing and operating TNA devices at airports, including possible external exposure of workers and passengers, possible internal exposure of passengers or other members of the public who may consume irradiated food items packed in baggage, anticipated radiation doses, potential exposure due to malfunctions of the EDS, and several accident scenarios. The NRC concluded that the environmental effects of normal TNA use in baggage or cargo handling ramps will be insignificant. The NRC found

that while some short-term residual radioactivity is induced in baggage at the time of screening, by the time the baggage emerges from the machine, the radioactivity is negligible. The NRC further found that "the maximum unrestricted area concentrations are calculated to be well below the maximum permissible concentrations specified in 10 CFR 20.106 and 10 CFR part 20, appendix B."

The FAA's EA for this rulemaking adopts the NRC's "Environmental Assessment and Finding of No Significant Impact." It provides that, in order to assure that implementation of the new regulation through the air carrier security programs will not permit a degrading of the minimal radiation exposure described in the NRC's EA, the FAA will provide, in each security program covered by new § 108.20, that no EDS (using a specific radiation source such as californium-252 that is subject to NRC jurisdiction) will be finally approved by the FAA unless the carrier demonstrates to the FAA that—

(1) For systems intended for use in the U.S., the EDS is covered by a license issued by the NRC (as required by 10 CFR 30.3), or by the appropriate Agreement State (as also required by the NRC's regulations);

(2) For systems intended for use outside the U.S., the carrier demonstrates either that the system is the same as one that has been previously licensed under NRC requirements, or that the system is registered by the NRC under 10 CFR 32.210. This is in addition to any requirements imposed by the country of installation.

The EA also indicates that, for each EDS that is approved by the FAA under § 108.20, each security program will also require that the carrier continue to comply with all conditions imposed on the installation and operation of that system under the NRC licensing and registration process.

The purpose of these requirements is to provide additional assurance that there will be no significant exposure to radiation. For these reasons, the FAA's EA concludes that the implementation of this final rule with respect to the installation and use of EDS's involving radioactive sources will not cause a significant impact on the quality of the human environment.

In consideration of the foregoing, the FAA environmental assessment included in the docket for this final rule contains a finding of no significant impact.

Two commenters doubt whether certain foreign governments opposed to

the presence of nuclear materials would allow TNA machines to be installed. Where needed, the FAA will work to effect coordination with foreign governments. The FAA recognizes that it cannot require air carriers to comply with EDS regulations if they are precluded from doing so by a foreign government. Should such an instance arise, the FAA would require alternate procedures.

Miscellaneous

Wet leases—One commenter expresses concern over aircraft operated under wet leases. Wet leasing is the practice of air carriers leasing aircraft and flightcrews (except flight attendants) to foreign carriers. Usually foreign carriers paint the aircraft and operate them as though they were their own. The commenter feels that because the baggage on flights on such aircraft would be subject to EDS screening, the resulting delays would mean foreign carriers would want to avoid leasing U.S. aircraft and therefore be able to bid more successfully for wet leases among themselves.

Because wet leases may present special circumstances, especially where the aircraft is not readily identifiable as a U.S. aircraft, the FAA will work with carriers regarding the application of EDS requirements and consider the use of alternative procedures.

Insurance—One commenter believes the FAA should assume responsibility for obtaining adequate insurance for suppliers of EDS equipment. The FAA does not agree with this comment as suppliers of aircraft and other aviation products have the capability of building the price of insurance into their product costs.

Discussion of the Final Rule

The final rule is being adopted as originally proposed. Thus, the FAA will have the authority to amend each air carrier's approved security program to require use of EDS's to screen all checked baggage on all international flights by U.S. carriers for which screening is required.

In its initial exercise of its authority under this final rule, the FAA intends to require deployment of about 150 EDS's at approximately 40 international airports that are served by U.S. air carriers, taking current security procedures and threat information into account. The FAA has already issued a proposed amendment to the security programs of U.S. air carriers relating to the initial deployment. If the proposed amendment is adopted, the FAA projects that as many as 50 EDS's may

be in use by the end of 1990, and approximately 150 EDS's may be in use by the end of 1991. The FAA will work closely with the industry in the implementation of the rule and evaluate operational experience to determine whether changes to these projections are necessary. As indicated in the NPRM, the FAA intends to phase-in implementation of this rule and may later expand the deployment to international flights at additional locations.

As stated in the proposed rule, the FAA will carefully consider whether and when to require the installation of EDS's at locations beyond the initial deployment. Any further deployment would occur only after additional action by the FAA to amend air carriers' security programs. This amendment process is established in § 108.25 of the Federal Aviation regulations (14 CFR 108.25). The process provides the affected air carriers notice and an opportunity to comment before final action is taken. The amendment process will provide a mechanism to evaluate the need for EDS use at specific locations, projected level of usage, level of vulnerability, availability of alternative security procedures, and other relevant factors that may affect a decision to expand the use of EDS's to new locations.

Section 108.7(b)(8)

Section 108.7(b)(8) will require certificate holders (air carriers) to describe in their approved security programs the procedures, facilities, and equipment used to comply with the new EDS requirements.

Section 108.20

This new section will require that each certificate holder conducting screening under an approved security program use an approved EDS to detect explosives in checked baggage on international flights in accordance with its security program. The rule does not require each individual certificate holder to own an EDS, nor does it preclude use of a single EDS by several air carriers. Indeed, the FAA believes that cooperation among air carriers is critical to the effective implementation of this rule.

Regulatory Impact Analysis Summary

Executive Order 12291, dated February 17, 1981, directs Federal agencies to promulgate new regulations or modify existing regulations only if the potential benefits to society for the regulatory change outweigh the potential costs to society. The Order also requires the preparation of a

Regulatory Impact Analysis of all "major" proposals except those responding to emergency situations or other narrowly defined criteria. A "major" proposal is one that is likely to result in an annual effect on the economy of \$100 million or more, a major increase in consumer costs, or a significant adverse effect on competition.

This final rule is determined to be a "major" rule as defined in the Executive Order, so a full Regulatory Impact Analysis evaluating alternative approaches has been prepared. This analysis is included in the docket, and quantifies, to the extent practicable, estimated costs to the private sector, consumers, Federal, State, and local governments, as well as anticipated benefits and impacts.

A summary of the Regulatory Impact Analysis is contained in this section. For a more detailed analysis, the reader is referred to the full Regulatory Impact Analysis contained in the docket (see **ADDRESSES**).

This section summarizes the cost and benefit assessment of an amendment to Part 108 of the Federal Aviation Regulations which would require U.S. air carriers conducting screening under an approved security program to use an explosives detection system (EDS) approved by the Administrator to screen checked baggage on international flights. The addition of new § 108.20 will require affected air carriers to use explosives detection systems in accordance with the provisions established by the Administrator and contained in their approved security programs. In addition, the economic analysis also considers two other alternatives; these include the option of broadening the scope of coverage to include screening all domestic and international baggage with EDS, and one in which screening would be conducted only for international operations at airports selected on a threat-driven basis.

The primary objective of this rule is the prevention of criminal acts or acts of terrorism against U.S. air carriers by individuals using explosive devices. Toward this end, the FAA has conducted extensive research aimed at detecting explosives. This research has concentrated on explosives detection system devices, including the Thermal Neutron Analysis (TNA) system and vapor detection systems, as well as advanced x-ray systems. The TNA device is the most advanced explosives detection system now available. Its capabilities can be enhanced by equipping them with x-ray systems. Therefore, the FAA has elected to

analyze three alternative proposals for explosive detection using these enhanced TNA systems over the ten-year period of 1990 to 1999. These are—

I. *Domestic and International Alternative*. Install explosives detection systems at 427 airports in the U.S. and at airports in 88 foreign countries over a ten-year phase-in period (100% checked baggage screening of U.S. domestic and international flights, eventually requiring 1,825 explosives detection systems by 1999).

II. *International Alternative (The Final Rule)*. Install only enough explosives detection systems to examine U.S. carrier international flights at domestic and foreign airports over a five year phase-in period (100% checked baggage screening of all U.S. international flights, eventually requiring 860 explosives detection systems by 1999).

III. *Threat-Driven Alternative*. Install 200 explosives detection systems at an unspecified number of domestic and foreign airports over a three year phase-in period, based on a threat-driven approach (100% checked baggage screening of all international flights at selected airports, eventually requiring 300 explosives detection systems by 1999).

It is important to note that in the NPRM, Alternative II's phase-in period was three years, while here, it is five years. The number of TNA systems required to screen all international flights at current enplanement levels rose from 179 in the NPRM to 491 in the final rule. The production capacity does not exist to install this many systems within three years, but will exist within five years.

The methods and assumptions used in the analyses for the alternatives have been developed by the FAA. A major consideration guiding this analysis is the assumption that 100% screening of checked baggage on flights where passenger screening is currently required would be conducted under all three scenarios at those airports where EDS are to be used. The analyses assume enough systems to take into account peak hour travel, the projected growth in enplanements, and air carrier logistical difficulties. Preliminary cost factors were obtained from manufacturers and research organizations. Information for the formulation of benefits was obtained from the safety records of the International Civil Aviation Organization (ICAO) and the FAA. The costs and benefits of each of these alternatives have been analyzed over the ten-year span of 1990 to 1999.

The costs associated with the acquisition, installation, operation, and repair and maintenance of the TNA systems were difficult to quantify because these systems are still in an early stage of development. As such, there is limited experience on which to draw. At the present, there is only one manufacturer now capable of producing TNA systems. The FAA encourages other manufacturers to develop and produce explosives detection systems to meet the anticipated worldwide demand. In addition, the FAA believes that the entry of other manufacturers into the market would stimulate competition and would reduce costs. Thus, the unit costs used in the analysis assume that mass production techniques and the efficiency with which enhanced TNA and other EDS and x-ray systems are produced would reduce prototype and initial production cost estimates. The FAA assumes that production capacity in 1990, the first year that the rule would be in effect, could be as high as 50 units. Production capacity could increase to as many as 100 units in 1991 and could expand to an annual rate of more than 150 units thereafter.

The FAA has estimated costs for explosives detection system equipment, x-ray enhancement apparatus, equipment maintenance and repair, airport space rental, and labor; these have been used to estimate the cost of compliance with the three alternatives. The cost of a prototype TNA system is estimated to be \$1 million in 1990. Based on discussions with the manufacturer on a quantity purchase, the FAA projects that the acquisition cost of a basic EDS unit, including delivery, installation, and operator training, would be \$750,000 in 1990 and 1991. The FAA further believes that the effect of competition and the expected increases in the efficiency with which these units would be produced over time, which would yield economies of scale, would cause the cost of \$750,000 to decline to \$500,000 per TNA unit. On the basis of the limited operating history of the equipment and information furnished by the manufacturer, the annualized cost of maintenance and repair for an

explosives detection system is estimated to be \$26,200 per year. The FAA expects that the acquisition cost of x-ray enhancement units, including delivery and installation and training, is assumed to be \$150,000 per unit in 1990 and 1991 and fall to \$75,000 per unit in 1992 and the ensuing years. The estimated annual cost of maintenance and repair for the x-ray system is estimated to be \$15,000 per unit in 1990 and 1991, which would then decline to \$7,500 per unit per year in 1992 and the following years.

The FAA assumes for this analysis that airport space for the system would be rented at an estimated \$25 per square foot per year which would cover all costs for site preparations (such as floor reinforcing or new construction), electrical power availability, space rental, etc. Using the estimated rental rate of \$25 per square foot per year, this yields an average yearly rental fee of approximately \$19,000 per system. This stream of revenues is expected to enable the airport authorities to recover all capital expenses over time.

Operating a TNA system with an enhanced x-ray system would require a system-wide average of two technical operators per eight hour shift. The annual salary, including appropriate overhead rate, for this type of operator is estimated to be \$30,000. Accordingly, the direct labor cost to the affected air carriers is \$120,000 per year per unit. In addition, the FAA has determined that each operator would initially require eight weeks of training, and this cost of training would amount to approximately \$5,000 per operator per year or \$20,000 for the four operators who are needed per unit. The FAA assumes that the job turnover rate is 25%; thus, there would be a recurring training cost of \$5,000 per operator per year for each established system.

To estimate the potential benefits of this rule, and of the alternatives, the FAA reviewed the safety record for the ten year period between 1979 and 1988. This review reveals that 19 separate criminal acts and incidents of terrorism using explosives were perpetrated against U.S. air carriers during this period. The FAA has classified these

incidents into Class I and Class II categories. The Class I category includes those incidents, such as the explosion aboard Pan American (Pan Am) Flight 103, that involve the loss of an entire aircraft and a large number of fatalities. Class II accounts for all other incidents in which airplanes were only partially damaged or the incident was partially averted, such as explosions that occurred outside the aircraft (usually somewhere in the airport itself). These two types of incidents vary significantly both in terms of costs and their frequency. The FAA estimates that those Class II incidents that would occur over the ten years from 1990 to 1999 would result in a discounted cost of \$31.0 million.

The losses associated with Class I or major incidents would, of course, be substantially greater. For example, the loss in human life and property, and reduced revenues from the loss of U.S. carriers' market share associated with Pan Am Flight 103 are estimated to have a present value range of \$411.0 million to \$520.0 million depending on the extent of market reduction. It is difficult to predict the extent to which international terrorism will increase. Nevertheless, the FAA believes that in the absence of additional preventive measures, terrorist attacks against U.S. air carriers would continue. The FAA can not predict the number and severity of future incidents. The frequency of such incidents would depend on several factors, including, but not limited to, the world-wide political climate, the skill and technical sophistication of terrorist organizations, and the success of efforts to avert these incidents. Given the historical record of one such incident in each of the past two decades and the expectation that the general threat will increase, and moreover, that the specific threat of sabotage will also increase, the FAA estimates total benefits on the basis of two Class I incidents. Therefore, in this case, the present value of the benefit associated with the prevention of these incidents would be as high as \$1.071 billion. Table I of this summary shows the estimated costs and benefits of these alternatives:

TABLE I.—SUMMARY OF COSTS AND BENEFITS

[Net present value in millions of dollars]

| Options | Estimated costs | Percentage of total incidents avoided for breakeven ¹ | Calculations |
|--|-----------------|--|------------------------|
| Alternative I (Domestic and International Alternative)..... | \$1,420 | 133 | \$1,420/\$1,071 = 133% |
| Alternative II (International Alternative—The Final Rule)..... | 896 | 84 | 896/\$1,071 = 84% |

TABLE I.—SUMMARY OF COSTS AND BENEFITS—Continued

[Net present value in millions of dollars]

| Options | Estimated costs | Percentage of total incidents avoided for breakeven ¹ | Calculations |
|--|-----------------|--|-------------------|
| Alternative III (Threat-Driven Alternative)..... | 393 | 37 | 393/\$1,071 = 37% |

The sum of the total incidents is equal to two Class I incidents and all Class II incidents avoided. The discounted present value of these incidents avoided is \$1,071 million. The percentages do not represent a judgment of the relative effectiveness of each alternative.

Table I examines how many Class I and Class II incidents would have to be prevented by each alternative for the alternatives to be cost beneficial. The percentages in the table do not represent a judgment of the relative effectiveness of each alternative; they show the percentage of total incidents whereby each of the three alternatives will have different breakeven points so as to become cost beneficial. The costs associated with each alternative are compared with those benefits projected from avoiding two Class I incidents and a discounted present value of the \$31 million worth of projected costs from all Class II incidents. For the purposes of this analysis, this is the projected universe of incidents that these alternatives are designed to address.

For Alternative II to be cost beneficial, it would have to prevent roughly four-fifths (84%) of this projected set of Class I and Class II incidents. If EDS screening includes domestic operations (Alternative I), this option would have to prevent more than the entire set of projected Class I and Class II incidents to be cost beneficial; in other words, it is not cost beneficial. The costs associated with limiting installation of EDS to those international operations at locations selected on a threat-driven basis (Alternative III) are roughly one third of the assumed set of incidents.

Because the number and potential severity of future attacks and the scope and location of threats are difficult to predict, the FAA has elected not to attempt to quantify the percentage of possible attacks that would be prevented by each alternative. For similar reasons, the FAA will not assign values to the probabilities of a Class I or Class II event for each alternative scenario.

In addition to these quantifiable benefits, the FAA expects further significant unquantifiable benefits. The rule would result in public recognition of additional security measures implemented by U.S. air carriers. The public's subsequent higher confidence

levels should result in more passengers and higher revenues.

The deterrence of terrorist attacks against U.S. civil aviation also has significant public and foreign policy benefits. In addition to the tragic effects on those involved and their families and friends, an attack on an American aircraft disrupts the lives and plans of great numbers of people who have suffered no direct loss in the incident. (Indeed, this is presumably one of the goals of those who perpetrate terrorist attacks.) The FAA cannot calculate the cost of uncompleted business, disrupted education, and deferred vacations. Nevertheless, that cost is unquestionably significant, and it will be avoided if the public retains a high level of confidence in the safety of the civil air transportation system. Maintaining and improving the public's confidence, while at the same time reducing the threat to human life and property, is the central goal of this rulemaking.

Comments—A total of 12 commenters raise economic issues. Some of those comments that dealt directly with economic issues as described in the NPRM will be briefly summarized in this section.

Several of the comments point out that the NPRM analysis did not include the costs of constructing housing and/or supporting structures for those EDS's that would need them. The FAA specifically had requested comments on such costs, and, based on these comments, has added housing costs by means of the calculation of space rental data. It is the FAA's view that the costs involved would depend on the individual circumstances and that the actual location of each EDS would be determined by individual airport layout and other factors.

One commenter believes that the analysis seriously underestimates the number of systems needed at New York-Kennedy Airport and other similarly configured and heavily utilized airports. This commenter believes that 2400 systems would be needed under Alternative II, which is six times the number of systems estimated in the

NPRM. The assumption used in the commenter's analysis revolves around the belief that 30, instead of 5, systems would be needed for New York-Kennedy Airport. (Five TNA systems were assumed for New York-Kennedy Airport in the NPRM's Alternative II). Therefore, because six times as many systems would be needed for this airport, the commenter estimates that six times the number of systems would be needed at all airports, both now and through 1999. The commenter did not disclose the methodology by which it was calculated that 30 machines would be needed for this gateway airport, so it is impossible for the FAA to analyze these assertions. Very few other airports included in the FAA's analysis are similarly configured or as heavily utilized as New York-Kennedy Airport. Therefore, while the FAA recognizes that the NPRM analysis underestimated the EDS requirements at a few major airports, it does not follow that the agency's analysis underestimated such requirements at all airports. As is discussed in the following paragraph, the FAA has recalculated the number of required systems.

The analysis presented in the Regulatory Impact Analysis may address some of the assumptions that were inherent in this commenter's analysis. To obtain the daily average number of outbound passengers, the annual numbers of outbound passengers for each airport was divided by 312 days; 312 days was used instead of 365 days of reflect the fact that many flights do not operate 7 days a week. The international peak hour percentage was increased from 15% to a range of 25% to 50%, depending on annual passenger flow, to take into account the demands on such heavily utilized airports. The per hour baggage requirements on the systems was lowered to 540 an hour to take into account the fact that baggage probably will not always be able to be fed into the system at a steady stream. In addition, extra machines were added to the busiest domestic and foreign airports to account for airport layout and baggage interline and transfer

problems. For example, this analysis' estimate for the number of TNA systems required at New York-Kennedy is nineteen, which the FAA believes is realistic.

This commenter also believes that the annual maintenance and repair costs for the basic TNA unit was too low. The figure used (\$25,000 per year unit) was the data provided, based on the limited operating history of the equipment and on information furnished by the manufacturer. However, even if the costs were 60% higher (\$40,000 per year per unit), the overall effect on costs would not be greater; total discounted costs would rise by less than 5%.

Another commenter interprets the FAA's statement in the NPRM that "in the absence of additional preventive measures", terrorist attacks against U.S. carriers will continue, and that this implied that the FAA considers that the proposed EDS is "the ultimate security solution." The FAA has never stated that EDS is the ultimate security solution; rather, the FAA believes it to be one of many security improvements which will be needed.

Several commenters stated that alternative EDS technologies exist that are less expensive than TNA. Currently, the TNA is the only explosives detection system that has been approved for use by the FAA. The FAA welcomes other EDS technology that will be less expensive than the TNA. TNA costs are used in the FAA's analysis because it is the only existing, proven system.

Several commenters raise environmental concerns with respect to the potential radiation effects of TNA systems. One comment called for the FAA to prepare an environmental impact statement with respect to this potential impact. In response to these comments the FAA has prepared an environmental assessment. This assessment has resulted in the conclusion that the adoption and implementation of this final rule will not have an adverse impact on the quality of the human environment. The assessment and Finding of No Significant Impact are included in the docket.

Several commenters state that since terrorism is being perpetrated against the U.S. government and not the air carriers, the government should pay for these systems. The U.S. government has traditionally not funded security measures needed to protect passengers on privately owned air carriers and does not intend to do so in this instance.

There has been concern expressed that requiring all U.S. air carriers to purchase EDS equipment would be an unrealistic drain on many of them, especially small carriers and those with

unscheduled service. The rule does not require carriers individually to purchase EDS systems for their own private use. Such carriers have the commonly used option of renting the use of such facilities from other carriers.

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) was enacted by Congress to ensure that small entities are not unnecessarily and disproportionately burdened by Government regulations. The RFA requires Federal agencies to review rules which may have a "significant economic impact on a substantial number of small entities." Issuance of the amendment to part 108 of the FAR will affect some small air carriers. The FAA's Order prescribing small entity size standards identifies a small air carrier as one with nine or fewer operating aircraft. According to FAA data for the period ending December 31, 1988, there were 54 air carriers subject to the rules of part 121 that operated nine or fewer airplanes. These 54 carriers are the entities affected by the rule.

The criteria for a "substantial number of small entities" is one-third of the small firms subject to the final rule, but no fewer than 11 firms. A review of the 54 small carriers engaged in scheduled and unscheduled service shows that only 10 firms would be subject to this rule. Therefore, it is certified that the amendment to Part 108 would not have a significant economic impact on a substantial number of small entities. In any event, if unforeseen problems arise in specific situations, the FAA will work with the air carrier involved to address appropriate checked baggage screening procedures.

Trade Impact Statement

The FAA finds that this rule will only impact part 121 operators and thus it is not likely to affect international trade. This final rule is expected to have no impact on trade opportunities for either U.S. firms doing business overseas or foreign firms doing business in the United States. While there will be an increased cost to U.S. air carriers as a consequence of this rule, these increased costs will be offset by the increase in public confidence, the avoidance of incidents, and by the ability to reduce the use of certain costly security procedures now required of U.S. air carriers.

Paperwork Reduction Act

The FAA finds that this final rule will not result in an additional burden under the Paperwork Reduction Act.

Federalism Implications

The regulations adopted herein will not have substantial direct effects on the States, on the relationship between the national Government and the States, or on the distribution of power and responsibilities among the various levels of government. Therefore, in accordance with Executive Order 12612, it is determined that these rules will not have sufficient Federalism implications to warrant the preparation of a Federalism Assessment.

Conclusion

For the reasons discussed above, the FAA has determined that this regulation is major under Executive Order 12291. In addition, the FAA certifies that this rule will not have a significant economic impact, positive or negative, on a substantial number of small entities under the criteria of the Regulatory Flexibility Act. This final rule is considered significant under the Regulatory Policies and Procedures of the Department of Transportation (44 FR 11034; February 26, 1979) because of its cost and the substantial public interest in aviation security. A Regulatory Impact Analysis of this rule, including a Regulatory Flexibility Determination and a Trade Impact Analysis, has been placed in the docket. A copy may be obtained by writing to the Director of Civil Aviation Security (see ADDRESSES).

List of Subjects in 14 CFR Part 108

Air carriers, Aircraft, Airmen, Airports, Arms and munitions, Explosives, Law enforcement officers, Reporting and recordkeeping requirements, Security measures, X-rays.

The Amendment

In consideration of the foregoing, the Federal Aviation Administration amends part 108 of the Federal Aviation Regulations (14 CFR part 108) as follows:

PART 108—AIRPLANE OPERATOR SECURITY

1. The authority citation is revised to read as follows:
 Authority: 49 U.S.C. 1354, 1356, 1357, 1421, 1424, and 1511; 49 U.S.C. 106(g) (revised, Pub. L. 97-449, January 12, 1983).
2. Section 108.7 is amended by adding a new paragraph (b)(8) to read as follows:

§ 108.7 Security program; Form, content, and availability.

* * * * *

(b) * * *

(8) The procedures and a description of the facilities and equipment used to comply with the requirements of § 108.20 regarding explosives detection systems.

3. Section 108.20 is added to read as follows:

§ 108.20 Use of Explosives Detection Systems.

When the Administrator shall require by amendment under § 108.25, each certificate holder required to conduct screening under a security program shall use an explosive detection system that has been approved by the Administrator to screen checked baggage on

international flights in accordance with the certificate holder's security program.

Issued in Washington, DC, on August 30, 1989.

James B. Busey,
Administrator.

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