TABLE 2—AFFECTED AIRPLANES AND ROTORCRAFT

Manufacturer
Airbus.
ATR—GIE Avions de Transport Régional.
The Boeing Company.
Bombardier, Inc.
Cessna Aircraft Company.
Dassault-Aviation.
Empresa Brasileira de Aeronautica S.A. (EMBRAER).
Eurocopter Canada Limited.
Eurocopter Deutschland GMBH (ECD).
Eurocopter France.
McDonnell Douglas Corporation.

Subject

(d) Air Transport Association (ATA) of America Code 26: Fire Protection.

Reason

(e) The mandatory continuing airworthiness information (MCAI) states:

The Civil Aviation Authority of the United Kingdom (UK) has informed EASA [European Aviation Safety Agency] that significant quantities of Halon 1211 gas, determined to be outside the required specification, have been supplied to the aviation industry for use in fire extinguishing equipment. Halon 1211 (BCF) is used in portable fire extinguishers, usually fitted or stowed in aircraft passenger cabins and flight decks.

EASA published Safety Information Bulletin (SIB) 2009–39 on 23 October 2009 to make the aviation community aware of this safety concern.

The results of the ongoing investigation have now established that LyonTech Engineering Ltd, a UK-based company, has supplied further consignments of Halon 1211 (BCF) to SICLI that do not meet the required specification. This Halon 1211 has subsequently been used to fill P/N [part number] 1708337B4 portable fire extinguishers that are now likely to be installed in or carried on board aircraft.

The contaminated nature of this gas, when used against a fire, may provide reduced fire suppression, endangering the safety of the aircraft and its occupants. In addition, extinguisher activation may lead to release of toxic fumes, possibly causing injury to aircraft occupants.

For the reason described above, this EASA AD requires the identification and removal from service of certain batches of fire extinguishers and replacement with serviceable units.

Compliance

(f) You are responsible for having the actions required by this AD performed within the compliance times specified, unless the actions have already been done.

Actions

(g) Within 90 days after the effective date of this AD, replace all Type H1–10 AIR Halon 1211 (BCF) portable fire extinguishers manufactured by SICLI, having P/N 1708337B4 and having any serial number listed in Table 1 of this AD, with serviceable fire extinguishers.

(h) Within 90 days after doing any replacement required by paragraph (g) of this AD, return the affected fire extinguisher to: SICLI, ZI la Saunière, 89600 Saint Florentin, France; telephone: +33 (0)3 8643 7930; fax: +33 (0)3 8635 3632; e-mail *jerome.villette@sicli.com;* Web site: *http://www.sicli.com.*

(i) As of the effective date of this AD, do not install any SICLI fire extinguisher having P/N 1708337B4 and a serial number listed in Table 1 of this AD, on any airplane or rotorcraft.

FAA AD Differences

Note 1: This AD differs from the MCAI and/or service information as follows:

(1) EASA AD 2009–0278, dated December 22, 2009, specifies a time of 30 days to do the actions. This AD requires that the actions be done within 90 days. We have determined that a 90-day compliance time will ensure an acceptable level of safety.

(2) EASA AD 2009–0278 includes fire extinguishers having certain serial numbers in its applicability. The EASA AD also includes a requirement to inspect to determine if the fire extinguishers have those serial numbers and replacement if necessary. Since the affected fire extinguishers are part of the applicability, it is not necessary to also require inspecting for them. Therefore, this AD includes fire extinguishers having certain serial numbers in its applicability and does not include an additional requirement to inspect for serial numbers; this AD requires replacement of all affected fire extinguishers.

Other FAA AD Provisions

(j) The following provisions also apply to this AD:

(1) Alternative Methods of Compliance (AMOCs): The manager of the office having certificate responsibility for the affected product has the authority to approve AMOCs for this AD, if requested using the procedures found in 14 CFR 39.19. Before using any approved AMOC on any aircraft to which the AMOC applies, notify your principal maintenance inspector (PMI) or principal avionics inspector (PAI), as appropriate, or lacking a principal inspector, your local Flight Standards District Office. The AMOC approval letter must specifically reference this AD.

(i) For transport airplanes: Send information to ATTN: Dan Rodina, Aerospace Engineer, International Branch, ANM–116, Transport Airplane Directorate, FAA, 1601 Lind Avenue, SW., Renton, Washington 98057–3356; telephone (425) 227–2125; fax (425) 227–1149.

(ii) For small airplanes: Send information to ATTN: Leslie B. Taylor, Aerospace Engineer, Standards Staff, Small Airplane Directorate, FAA, 901 Locust Street, Room 301, Kansas City, MO 64106; telephone (816) 329–4134; fax (816) 329–4090.

(iii) For rotorcraft: Send information to ATTN: DOT/FAA Southwest Region, J.R. Holton, Jr., ASW–112, Aviation Safety Engineer, Rotorcraft Directorate, Safety Management Group, 2601 Meacham Blvd., Fort Worth, TX 76137; telephone (817) 222–4964; fax (817) 222–5961.

(2) Airworthy Product: For any requirement in this AD to obtain corrective actions from a manufacturer or other source, use these actions if they are FAA-approved. Corrective actions are considered FAA-approved if they are approved by the State of Design Authority (or their delegated agent). You are required to assure the product is airworthy before it is returned to service.

(3) Reporting Requirements: For any reporting requirement in this AD, under the provisions of the Paperwork Reduction Act (44 U.S.C. 3501 *et seq.*), the Office of Management and Budget (OMB) has approved the information collection requirements and has assigned OMB Control Number 2120–0056.

Related Information

(k) Refer to MCAI EASA Airworthiness Directive 2010–0278, dated December 22, 2009, for related information.

Material Incorporated by Reference

(l) None.

Issued in Washington, DC, on February 4, 2010.

Kalene C. Yanamura,

Acting Director, Aircraft Certification Service.

[FR Doc. 2010–3223 Filed 2–18–10; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 121, 125, and 135

[Docket No. FAA–2006–26135; Amendment Nos. 121–347, 125–59, and 135–120]

RIN 2120–AI79

Filtered Flight Data

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final rule.

SUMMARY: The FAA amends digital flight data recorder regulations affecting certain air carriers and operators. This final rule prohibits the filtering of some original flight recorder sensor signals unless a certificate holder can show that the data can be accurately reconstructed. This final rule improves the integrity and quality of the data recorded on digital flight data recorders while giving aircraft designers and operators more flexibility in system design and operation where allowable.

DATES: These amendments become effective April 20, 2010.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this final rule contact Brian A. Verna, Avionics Systems Branch, Aircraft Certification Service, AIR–130, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591;

telephone (202) 385–4643; fax (202) 385–4651; e-mail *brian.verna@faa.gov*. For legal questions concerning this final rule contact Karen L. Petronis, Senior Attorney for Regulations, Regulations Division, Office of the Chief Counsel, AGC–200, Federal Aviation Administration, 800 Independence Avenue, SW., Washington, DC 20591; telephone (202) 267–3073; fax 202–267–7971; e-mail *karen.petronis@faa.gov*.

SUPPLEMENTARY INFORMATION:

Authority for This Rulemaking

The FAA's authority to issue aviation safety rules 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 III, Section 44701. Under that section, the FAA is charged with prescribing regulations providing minimum standards for other practices, methods and procedures necessary for safety in air commerce. This regulation is within the scope of that authority since flight data recorders are the only means available to account for aircraft movement and flight crew actions critical to finding the probable cause of incidents or accidents, including data that could prevent future incidents or accidents.

I. Background

A. Statement of the Problem

During several aircraft accident investigations, the National Transportation Safety Board (NTSB) found that some flight data recorder systems were filtering flight recorder sensor signals before they were recorded. As a result, the recorded data did not accurately reflect the aircraft's performance or the movements of the flight control systems before and during the accident or incident under investigation. Such signal filtering both hampered and delayed the investigations. Throughout the investigation of American Airlines Flight 587 (Flight 587), which crashed after takeoff from John F. Kennedy Airport, Jamaica, New York in November 2001, the NTSB expended significant time and resources trying to recreate the performance and movements of the flight controls of the accident aircraft.

In November 2003, the NTSB issued three recommendations (NTSB Recommendations A–03–48/A–03–49/A–03–50, November 6, 2003) on digital flight data recorder (DFDR) recording requirements. The NTSB recommended that the FAA require all aircraft to have a DFDR system installed "capable of recording values that meet the accuracy requirements through the full dynamic range of each parameter at a frequency sufficient to determine a complete, accurate, and unambiguous time history of parameter activity, with emphasis on capturing each parameter's dynamic motion at the maximum rate possible, including reversals of direction at the maximum rate possible."

B. Action by the FAA—Notice of Proposed Rulemaking

In 2006, the FAA issued a notice that proposed a prohibition on filtering certain original flight data sensor signals (November 15, 2006, 71 FR 66634). The 2006 NPRM contains a complete discussion of the proposal and the events leading up to it.

The comments received in response to the 2006 NPRM alerted the FAA to several features of the proposed prohibition that would have had significantly more impact than the agency had expected. The issue that produced the most comment was the proposed definition of filtering, which described filtering as a change to any original sensor signal for any reason other than the three specified in the proposal. The comments indicated that the level of signal processing that is in use on newer flight data systems no longer corresponds to more traditional concepts of filtering, and leaves in question whether current system designs would be considered to be filtering data before recording.

As the FAA considered changes to the definition of filtering, the agency continued studying what is quickly becoming the standard in electronic signal processing. Our intent in the 2006 NPRM was to prohibit the processing of certain flight data sensor signals that would result in inaccurate data being preserved, as happened with the rudder movement data on Flight 587.

The investigation following the crash of Flight 587 indicated that the issue was not that data were filtered, but that the actual rudder movement data could not be reconstructed once processed by installed filtering devices. While a prohibition like our 2006 proposal would solve the problem, current capabilities suggested that when properly processed and documented, data can be reconstructed from a system design that incorporates filtering.

C. Action by the FAA—Supplemental Notice of Proposed Rulemaking

The determination that flight recorder systems from which data may be reconstructed were acceptable exceeded the scope of the changes in the 2006 NPRM. Accordingly, the FAA issued a supplemental notice of proposed rulemaking (August 15, 2008, 73 FR 47857)(SNPRM). The SNPRM proposed that recording of filtered flight data be allowed if a certificate holder could demonstrate that the 'filtered' recorded data meet the recording requirements of the regulations, and that the original sensor signal data could be accurately reconstructed using a documented, repeatable process.

In the SNPRM, the FAA changed its position from a strict filtering prohibition to one of conditional allowance that distinguishes between two groups of flight recorder parameters. The first group contained those that are prohibited from being filtered unless a certificate holder can demonstrate that it has done the tests and analyses and maintains the procedures necessary to reconstruct the original sensor signal values from the filtered recorded data. The second group included those parameters whose signals may be filtered without further action as long as they meet the requirements of the regulations.

The option not to filter any or all parameters remained an acceptable means of compliance with the regulations. In all cases, the accuracy and all other requirements of Appendix M of part 121 (or Appendix E of part 125 or Appendix F of part 135) must continue to be met. The ability to reconstruct data would not forgive any appendix requirement for any parameter.

The proposed time for compliance in the SNPRM was four years after the effective date of the final rule. Within that four-year period, one of two things was to happen.

If an operating certificate holder elected not to filter any of the restricted parameters, it had four years to test its DFDR systems, verify that none of the restricted parameters are being filtered, or, if a restricted parameter is being filtered, modify that parameter to eliminate the filtering.

If a certificate holder chose to filter a restricted parameter and show by test and analyses that the originating signal can be reconstructed, the procedures for reconstruction would have to be submitted to the FAA after the next heavy maintenance check of an airplane (beginning six months after the effective date of the final rule), but not later than two years after the effective date of the final rule. If a certificate holder has several of the same make, model and series airplane (group) with the same certificated DFDR system installed, the

procedures need only be submitted once for the entire group of airplanes with identically installed systems. The compliance date for a group would be tied to the first airplane going in for a heavy maintenance check six months after the rule is final. Submission of the data to the FAA would be required no later than the time the first airplane of a group completes that heavy maintenance check.

This compliance schedule was intended to allow time for the FAA to determine that the submitted reconstruction procedures are repeatable, but still allow time for other compliance action (within the four years) if repeatability was not accomplished. A certificate holder that was unable to show repeatability for any restricted parameter would be required to modify the parameter to eliminate filtering before the four year compliance period ends.

We did not include in the rule text a time limit for submission of the reconstruction procedures to the NTSB following an accident or occurrence that requires the NTSB be notified. We presumed that the reconstruction data are included as part of the recorder and its data that are subject to § 121.344(i) and the NTSB's authority under 49 CFR part 830. We invited comment on whether a specific, brief time for submission needs to be included separately in the rule for the reconstruction procedure data.

The SNPRM contains a more complete discussion of the proposal.

Following publication of the SNPRM, industry members contacted the FAA indicating that the economic evaluation did not reflect the effect of the proposed rule language. The SNPRM stated that a certificate holder could not filter data unless the recorded values complied with Appendix M and the certificate holder possessed procedures to reconstruct original sensor signals. The FAA had intended to propose rule language that applies to certain parameters if the recorded values do not comply with Appendix M. If Appendix M requirements are not met, then the certificate holder would have the choice to either remove the filtering or show by test and analysis that the original, unfiltered values can be successfully reconstructed to meet the requirements of Appendix M. On November 13, 2008, we amended the SNPRM (73 FR 67115) by publishing a correction and extension of the comment period until December 29, 2008.

II. Discussion of Comments to the SNPRM

A. General Summary

The FAA received eight comments covering more than 30 issues in response to the SNPRM. The NTSB generally agreed with the proposed rule and urged adoption of a final rule. Airbus, Boeing Commercial Airplanes (Boeing), the Regional Airlines Association (RAA) and Astar Air Cargo, Inc. (Astar) agreed on the importance of recording unfiltered, accurate data, but did not agree with the SNPRM's approach to accomplish this goal. The General Aviation Manufacturers Association (GAMA) agreed with the rule as proposed and provided supplemental cost information. Two individual commenters expressed support for the rule as proposed.

B. Parameters Covered by the Filtering Prohibition

In the SNPRM, the FAA used the commenters' term "no filter list" to describe those parameters prohibited from being filtered. While not entirely accurate, the FAA continues to use "no filter list" when discussing these comments to prevent further confusion.

The SNPRM proposed the same "no filter list" as the 2006 NPRM with the addition of 14 parameters requested by the NTSB in its 2006 comment. The FAA included these additional parameters in proposed § 121.346(b)(1) because the NTSB stated that they would provide valuable data during accident investigation and should not be filtered.

Airbus and Boeing asked that the FAA remove all parameters from the "no filter list" except parameters 12–17 and 88 based on the complexity of current filtering techniques and the cost burden to industry associated with FDR system modifications. They cited specific cases where aircraft systems (such as an air data computer and an air data inertial reference unit) process data from multiple sources to be transmitted through an ARINC 429 data bus, and to be used by other aircraft systems, including the DFDR. Airbus identified parameters 2, 3, 4, 6, 7, 9, 26, 32, 42, 43, and 70 as coming from these multiple source systems. Boeing provided general information that supported the Airbus comment, and noted that significant cost and effort would be required to revise multiple aircraft systems to comply with the proposed rule. Airbus also raised the modification cost issue, although it did not provide any supporting cost data for the 11 parameters it suggested be removed from the proposed list. Boeing noted that it was not aware of any investigation that had been adversely affected by filtered data from the parameters it suggested be excluded, and thus could find no safety benefit that would balance the cost of the system revision.

Boeing provided specific information supporting its request to remove the parameters for heading (number 4) and engine thrust (number 9) from the "no filter list." Boeing noted that the Appendix M requirements for these two parameters indicate that the recorded values are to come from the primary flight crew reference. These data are smoothed for readability when displayed to the flight crew. Their being filtered is required in the appendices to parts 121, 125, and 135, and thus should not be included in the "no filter" list.

Boeing and Airbus stated that the acceleration outputs, parameters 5, 8, and 18, should not be included in the "no filter list." They argued that ARINC Characteristic 717 "Flight Data Recording and Recording Systems" specifies that accelerometer outputs be filtered in order to provide accurate and readable data to the DFDR. They stated that removing the ARINC-specified filtering would result in erroneous acceleration data due to aircraft vibration.

The FAA agrees with Boeing and Airbus that the parameters covered by the prohibition should be limited to flight control surface positions, flight control input positions and flight control input forces. Since parameters 1 through 4, 6, 7, 9, 26, 32, 43, 68, 70, and 77 are non-flight control parameters and are slower-changing parameters sampled at less than 4 Hertz (Hz), they are not negatively affected by filtering. Additionally, the FAA agrees with Boeing and Airbus regarding parameters 5, 8, and 18. Although these are more quickly changing parameters, without the filtering specified by ARINC 717, the accelerometers would provide unreadable data. The FAA has determined that there is no safety benefit in requiring reconstruction of the original sensor signal values for these parameters, and that the impact on industry would have been significantly greater than the FAA anticipated when they were proposed for inclusion.

The FAA has not changed its position on parameter 42 (throttle lever angle). Although it is only required to be sampled at 1 Hz, parameter 42 is a critical flight control input position parameter and remains subject to the filtering restriction.

Accordingly, the final rule does not restrict the filtering of the non-flight control parameters as discussed above.

Further, the FAA agrees with Boeing regarding the recording of primary flight crew reference for parameters 4 and 9, and the two parameters are not included in the filtering prohibition in the final rule.

C. Filtered Flight Data Signal Definition

In the SNPRM, the FAA proposed that a flight data recorder signal is considered filtered when an original sensor signal is changed in any way, other than changes necessary to:

(1) Accomplish analog to digital conversion of the signal,

(2) Format a digital signal into a DFDR compatible format; or

(3) Eliminate a high frequency component of a signal that is outside the operational bandwidth of the sensor.

Boeing requested an expansion of this definition that would allow the averaging of two or more data samples acquired at the same point in time from different sensors, which would provide the best available representation of that parameter.

Boeing and Airbus each recommended changes to the term "original sensor signal." Airbus recommended replacing it with the term "signal output from the original sensor system." Boeing recommended defining a sensor as a device that perceives deviations from a reference and converts them into signals or information that can be used by systems on the airplane. Boeing added that a sensor can be a system that accepts information from multiple points of measurement and processes this information into data useable by other airplane systems.

While the FAA disagrees with Boeing's request to expand the definition of a filtered flight data signal, the agency agrees with Boeing and Airbus that the concept of what constitutes an original sensor signal can be expanded within the regulatory definition. To address these concerns, material from the commenters will be incorporated as examples in FAA Advisory Circular 20–141B "Airworthiness and Operational Approval of Digital Flight Data Recorder Systems."

The FAA agrees with Boeing and Airbus that an original sensor signal can come from either a single sensor or a system that accepts multiple sensor inputs to provide accurate information to other aircraft systems. For example, the FAA does not consider it necessary to record every ring laser gyroscope input into the electronic flight instrument system, nor to directly record the output of an unfiltered accelerometer. The signal conditioning and filtering techniques used to record parameters 2, 3, 4, 6, 7, 9, 26, 32, 43, and 70 are necessary to provide accurate data for several aircraft systems, only one of which is the flight recorder system. The redesigning of aircraft critical systems or the significant alteration of current instruments from which data are gathered was not the intent of the proposed rule, and would be outside the scope of this rulemaking.

D. Reconstruction of Filtered Data

Shortly after the close of the comment period for the 2006 NPRM, the FAA learned of technological developments that would allow the reconstruction of data that had been filtered before they were recorded. The FAA determined that this option should be made available to operators rather than the simple prohibition proposed in the 2006 NPRM. That decision led to the publication of the SNPRM in 2008, which proposed to allow filtering if data could be reconstructed, and requested comment on several issues related to the ability to reconstruct.

Boeing commented that, with regard to parameters that are sampled at one second or slower, reconstruction would be both "unrealistic and problematic" and suggested that the option of reconstruction not be included in the final rule. Boeing noted that for some parameters, the data are conditioned at the microsecond level. When sampled at once per second, the conditioned inputs are nonexistent and not subject to reconstruction.

The FAA understands Boeing's concern and agrees that, under the circumstances stated, the data would not be available for reconstruction. The agency presumes from Boeing's comment that its position is based on the assumption that the conditioned data would be considered filtered under the FAA's proposed definition, making it both subject to the prohibition yet impossible to reconstruct. However, from the examples presented to the FAA by Boeing, the type of conditioning taking place would not be considered filtering under the proposed definition, and thus not subject to the prohibition or the reconstruction option. The option to reconstruct filtered data remains in this final rule. The reconstruction of filtered flight data has been proven to be effective for rapidly changing parameters (sampled at four or more times per second).

Astar noted that the requirement to maintain DFDR data appears in § 121.344(i), while the filtering requirement is being moved to new § 121.346. Astar commented that the separation of the requirements makes the proposed language (including the phrase "of this section") inaccurate.

The FAA agrees. The new § 121.346(c)(2)(ii) references § 121.344(i) as a requirement for reconstruction documentation.

The GAMA requested that the FAA provide further guidance regarding the type of documentation an operator must possess to demonstrate compliance with the proposed regulation. The GAMA noted that part 135 operators generally do not operate large fleets of similar airplanes, and thus a simple approach to documentation is needed.

The FAA agrees on the need for simple compliance documentation. As discussed in more detail below, each operator will be responsible for creating a record for each of its airplanes indicating its compliance status with this rule, including a reference to any parameters being filtered. The FAA anticipates that much of this analysis will be available from the original equipment manufacturers. A record of each airplane's status regarding filtering is to be maintained as part of the flight data recorder correlation documentation already required. Compliance with the requirements for reconstruction data, including record maintenance, will be more complex if filtering is found and the reconstruction option is chosen. Detailed information regarding the content and maintenance of that data will be available in FAA Advisory Circular 20–141B "Airworthiness and Operational Approval of Digital Flight Data Recorder Systems."

E. Appendix M

1. Introductory Text

In both the 2006 NPRM and 2008 SNPRM, the FAA proposed the following language to clarify "dynamic condition" as used in the introductory text to part 121 Appendix M (and comparable appendices in other parts):

"Dynamic condition means the parameter is experiencing change at the maximum rate available, including the maximum rate of reversal."

In its comments on both proposals, the NTSB requested the language be revised to state the "maximum rate possible." The NTSB stressed the importance of having recording systems capable of accurately recording motion rates typically experienced during an accident sequence.

In its comment to the SNPRM, Boeing requested that the language be eliminated. Boeing stated that the prohibition in proposed § 121.346 eliminates the need for the introductory text in the appendices. In the alternative, Boeing suggested that the

introductory text be revised to read: "[d]ynamic condition means the parameter is experiencing change at the maximum rate the source system can cause by design, including the maximum rate of reversal." Boeing interprets dynamic condition to be both fundamental to the design of and unique to the function of each aircraft system.

Airbus requested that the introductory text be revised to read: "[d]ynamic condition means the parameter is experiencing change at the maximum rate under operational conditions, including maximum rate of reversal." Airbus was concerned that the proposed language went beyond the operational limits of actual systems, and further suggested that the language be moved from the appendix to § 121.344.

The FAA has decided that the introductory text of the appendices will refer to the "maximum rate attainable." Following much debate, the term attainable appears to satisfy the commenters' concerns, including the design limitations of a specific source system.

In the SNPRM, the FAA noted that the NTSB did not provide any rationale for its suggested change to "maximum rate possible" and the agency could not conclude that it was an improvement. Since the word "possible" could be interpreted to include states that are well beyond the operational range of equipment, the suggested change appeared inappropriate as a regulatory standard.

Additional guidance will be included in FAA Advisory Circular 20–141B "Airworthiness and Operational Approval of Digital Flight Data Recorder Systems."

Finally, the FAA does not agree that the introductory text should be relocated to § 121.344. The text refers to requirements for each parameter as listed in the appendix. Separating it from the appendix requirements would cause unnecessary confusion.

2. "Accuracy (Sensor Input)" Column in Appendix M

Boeing stated that the appendix column titled "Accuracy (Sensor input)" is ambiguous in terms of what constitutes accuracy and how accuracy is measured. Boeing submitted its own definition of the term "accuracy" based on its suggested definition of the term "sensor" (discussed above). Boeing described its understanding of accuracy as being the relationship between the actual entity being measured and the recorded position of that entity within a stated range.

Airbus requested that the FAA provide values for the maximum dynamic error allowable for each parameter in the appendices. Airbus added that the amount of dynamic error is dependent on the sampling rate and the operational condition of an individual aircraft.

The FAA disagrees with adding a definition of accuracy or adding maximum dynamic error in the appendices. The accuracy column has been present in the regulation since its adoption in 1997 and has not been an identified source of confusion. Further, the FAA did not propose any changes to accuracy specifications, making these suggested changes outside the scope of this rulemaking. Except for the change to the term "maximum rate attainable" in the introductory text, no other changes to the appendices are being adopted in this final rule. The FAA will expand its discussion of how accuracy is measured in the update to the advisory circular material based on material submitted by the commenters.

3. Expansion of Appendix M

Boeing requested that Appendix M include a table defining each parameter's primary and secondary purposes, whether or not it should be filtered, and from what source it should be recorded.

The FAA considers an additional table in Appendix M to be inappropriate and beyond the scope of this rulemaking. Other than a clarification of the language in the introductory text, no changes to Appendix M were proposed. Compliance with Appendix M remains unchanged.

Astar requested that the parameters affected by this rule be identified by an additional column in the appendices. Astar also found the placement of the filtering prohibition in § 121.346 (rather than § 121.344) to be misleading.

The FAA does not agree with Astar that an additional column in the appendices is necessary. The filtering prohibition was moved to a separate regulatory section in order to highlight its importance and prevent it from being overlooked in the extensive requirements already present in § 121.344. No changes have been made based on this comment.

F. Applicability

1. Existing and Newly Manufactured Aircraft

In the SNPRM, we proposed that the filtered flight data prohibition apply to both existing and newly manufactured aircraft. Airbus and the RAA agreed with the approach to allow filtering if an operator can demonstrate accurate, repeatable reconstruction of an original sensor signal. However, they stated that any final rule should only apply to newly manufactured airplanes or airplanes on which Supplemental Type Certificate (STC) changes to the flight recorder system have been installed.

Airbus noted that such application of the rule would be less costly since manufacturers would be able to combine new designs into other flight recorder system improvements.

The RAA stated that the safety concerns raised by the FAA are issues applicable to the design and certification processes, making the solution better suited to be applicable only to newly manufactured airplanes.

As we stated in the 2006 NPRM and the SNPRM, the FAA considered the regulatory alternative of limiting the filtering prohibition to newly manufactured aircraft. While this approach is always less costly than a rule that affects the in-service fleet, it would also fail to address the aircraft currently operating with flight recorder systems that filter critical flight data before recording it. The FAA is also concerned that failing to cover in-service aircraft could lead to more filtering, which could result from future system modifications on in-service aircraft not subject to the prohibition.

Experience has shown that filtering has caused problems during accident investigations. The FAA disagrees that the reconstruction efforts during the investigation of Flight 587 had an acceptable outcome. The NTSB has not released any formal opinion that the results from the Flight 587 data reconstruction were satisfactory, or that the processes involved in that data reconstruction were acceptable. The FAA recognizes that data reconstruction, when satisfactory from an accuracy standpoint and shown to be repeatable, is an acceptable alternative and has included it in this final rule. However, the agency cannot conclude that the problems uncovered by the Flight 587 investigation have been solved. Allowing airplanes to remain in the fleet while filtering critical data is not an acceptable alternative. Without this rule, there would be no requirement to develop and maintain accurate, repeatable processes for reconstructing data that are filtered before being recorded.

2. A300/A310 Airplanes

Airbus stated that on its A300–600 and A310 airplanes, parameters 15, 16, 17, and 19 are filtered under our proposed definition. Airbus noted that the filter conversion algorithms have been solved for the A300/A310 airplanes, concluding that the problem

will not occur again, unless a customer has chosen to change the recording system through an STC.

Astar stated its understanding that the FAA's reference to the A300 in the SNPRM is to the A300–600 model. Astar added that it operates the A300–B4B model airplane and has not identified data filtering during its review of research and engineering documentation. Astar requested that the final rule include a list of those aircraft that are not covered by the rule.

The RAA stated that there had to be "a more cost effective way to identify the DFDR's of concern without having every certificate holder "recertify" their product." The RAA also stated that since "the FAA has the certification data for the DFDR systems for all airplane types in operation," the agency should be able to determine specific aircraft types that "need not be recertified to the new standards."

As discussed above, the FAA finds it unacceptable to limit the applicability of this rule as suggested. The FAA does not know the identity of all models or the total number of airplanes that may be recording filtered data, and thus has no rational basis to restrict applicability. The FAA does not possess the engineering documentation required to evaluate the DFDR systems of all airplanes currently in operation. The requirement for each operator to assess the function of its airplanes with regard to filtering is a critical facet of this rule. This effort is not a recertification, as suggested. It is first a determination of system function. Once that determination is made, and if filtering is found, the operator will have the choice of how to comply with this rule. The FAA cannot ignore the possibility of an in-service airplane filtering critical data simply because the model is no longer in production. Similarly, limited applicability leaves open the possibility of future filtering by modifications made on airplanes that were not filtering when the rule took effect. The applicability of this final rule is adopted as proposed.

3. Part 91 Airplanes

The GAMA stated that the proposed regulation would have a significant cost and burden impact on the owners and operators of aircraft that are equipped with DFDRs as required under § 91.609. The GAMA noted that it is typical for an aircraft that operates under part 135 to begin and end its operating life cycle under part 91. For aircraft equipped with a flight recorder operating under part 91 and 135, the GAMA estimated that between 1,125 and 5,600 aircraft could be affected, resulting in a $2,000,000 to $9,000,000 impact on the general aviation community for no measurable benefit.

Neither the 2006 NPRM nor the SNPRM proposed any changes to part 91 requirements. The FAA cannot predict and would not have any basis for presuming how many or which airplanes might change operating parts, or who would be operating them. In addition, the costs of complying with this rule would be minimal when compared to the significant differences between part 91 and part 135 operating requirements overall. No change to the regulations is being made based on this comment.

G. Compliance Time

The SNPRM included a compliance time from six months to two years for an operator to develop, validate, and submit filtered data reconstruction procedures to the FAA. The proposed rule included a final compliance time of four years for airplanes manufactured up to 18 months after the effective date of a final rule.

Astar commented that the compliance time in the 2006 NPRM appears to be different from that in the SNPRM, and suggests that the time for demonstrating that an airplane's flight data recorder system is not filtering data is confusing.

The FAA understands the commenter's concerns and has reconsidered the language of the compliance time paragraph. The final rule includes the following compliance requirements.

Operators will have 18 months from the effective date of this rule (referenced in this discussion as the reporting date) to review their DFDR systems and create a record that indicates whether the DFDR system on each airplane is filtering any of the parameters included in the "no filter list." If any of those parameters are being filtered, the record must also indicate which are affected. If no parameters are being filtered, that record entry should be made at the time of the determination, and an operator need take no further action unless a change is made to a DFDR system. Records of this action are to be maintained as part of the flight data recorder correlation documentation already required by the regulations.

Operators that identify filtered parameters will have two options. If an operator chooses to remove the filtering, it has four years from the effective date (thirty months after the reporting date) to make the system modifications. If an operator chooses to demonstrate by tests and analyses that filtered data can be reconstructed, the operator has up to 18 months from the reporting date to submit its reconstruction package to the FAA for approval. This submission date accounts for the time needed for the FAA to review the tests and analyses and verify their repeatability.

In all cases, compliance with the rule is required four years from the effective date. In no case will the submission of reconstruction tests and analyses be considered compliance until that submission is approved by the FAA. Operators that choose that method of compliance are cautioned to submit their tests and analyses as early as possible in case their submissions fail to be approved and other action need be taken.

Operators may submit material from manufacturers for all showings required. However, for all 'group' submissions (all airplanes of a particular model, for example), the operator must indicate in its records that the manufacturer's verifications apply to a particular airplane's DFDR system and that the airplane's DFDR system has not been modified to remove it from the group characteristics with regard to data filtering. Entries must be made for individual airplanes, not for models as a group. The record must be maintained as part of the flight data recorder correlation documentation already required by the regulations.

These compliance times provide ample opportunity for certificate holders to make choices about their equipment and conduct any necessary analyses during a regularly scheduled heavy maintenance visit, reducing potential impact on scheduled operations or additional out-of-service time. Much of the initial work in determining whether filtering is present on restricted parameters does not require physical access to airplane systems, but may be determined by reference to the airplane's DFDR system engineering and maintenance documentation.

H. Cost/Benefit Analysis

In the regulatory evaluation for the 2008 SNPRM, the FAA estimated it would cost certificate holders a total of $28,160 to undertake a review of DFDR systems documentation to determine whether filtering were taking place. The FAA stated that it was unable to estimate any further impact of the proposed rule, since we had no data indicating the number of airplanes in the fleet that were filtering data, nor how much it would cost in any instance to correct. Commenters provided some cost information, as discussed below, but none provided data related to developing reconstruction procedures.

1. Airbus A300/A310 Retrofit Costs

Airbus estimated that, for its A300/A310 fleet, the engineering costs to correct the recording of filtered data for parameters 12 through 17 and 88 would be about $750,000. In addition, equipment to make each airplane compliant with the rule would cost between $25,000 and $40,000 per airplane, for a total of $26 million to $46 million for the U.S. Airbus fleet. Airbus indicated that these were costs of this proposal.

The FAA reiterates the findings from the SNPRM that the cost to correct the DFDR systems on the Airbus A300/310 to comply with the existing Appendix M requirements is not a cost of this rule. Even though the 1997 regulations do not specifically prohibit filtering, the Flight 587 investigation discovered that the airplane's recorded data did not meet the accuracy performance requirements of Appendix M. Consequently, the compliance cost estimated by Airbus is the cost of complying with Appendix M, which has been in effect since 1997. This compliance cost would be incurred whether we had ever proposed a rule change regarding filtering because the aircraft did not comply with Appendix M. This rule does not change compliance with Appendix M. It simply provides an option of how compliance may be met: whether the data are recorded unfiltered or are filtered and can be reconstructed.

2. Original Equipment Manufacturer Versus Operator Costs

Boeing stated that many operators would not be able to determine which parameters are filtered. Boeing added that the operators depend on the manufacturer to identify conditioned parameters and provide reconstruction procedures, if applicable. Boeing requested that the FAA account for these costs in the regulatory evaluation.

The FAA agrees that operating certificate holders would be expected to consult with the original manufacturers of their equipment to identify which (if any) DFDR parameters are being filtered. The list of parameters that must be evaluated is now limited to flight control surface positions, flight control input positions, flight control forces, and throttle lever position. The effort needed to identify whether any of these eight parameters are being filtered under the regulatory definition is included in the regulatory evaluation. The cost is assessed on the operator.

I. Changes Made Through Operating Rules

Astar agreed with Air Tran's 2006 comment that it is improper to use the operating rules of part 121 to impose technical requirements unique to a specific model of aircraft or unique to the design of an aircraft system. Astar noted that operators are not typically involved with the engineering of aircraft systems, and usually do not install or alter components. It considers data filtering to be a function of the DFDR system design and not the responsibility of the operators.

The FAA's position has not changed since responding to AirTran's comment in the 2008 SNPRM. The DFDR requirements are part of the operating rules. The only effective way to implement changes to in-service aircraft is through the operating rules, since the certification rules generally are not retroactive and do not include the specific requirements. This rule makes specific changes to certain flight recorder parameters, and those parameters exist as part of the regulations in parts 121, 125, and 135. A change made to the certification rules would not affect aircraft in service.

J. Miscellaneous Comments

1. DFDR System Review

Astar noted that the SNPRM stated if a certificate holder elects not to filter any of the restricted parameters, it has four years to test its DFDR systems and verify that none of the restricted parameters are being filtered. Astar stated that § 121.346(c) does not indicate that a certificate holder should test the DFDR system to confirm whether a parameter is filtered or not. Astar requested that the FAA remove the explanation of a DFDR system test when a review of engineering and maintenance documentation could be used to identify parameters that are filtered.

The FAA agrees that the SNPRM did not include a requirement for a certificate holder to test its DFDR system to confirm whether a parameter is filtered. The final rule includes a requirement for operators to review their DFDR systems and create a record that includes each of its airplanes indicating whether and which parameters are being filtered. The system review information may be acquired from the equipment manufacturer and a physical system test may not be necessary. If filtering is found, the means of compliance with this rule is also the choice of the operator.

2. Compliance Decision Diagram

Airbus submitted a complex decision diagram that illustrates its understanding of the proposed rule. Airbus stated that if the FAA did not agree with the logic of the diagram, Airbus would be unable to provide cost information associated with each parameter.

The FAA does not agree with the logic that underlies Airbus's decision diagram. Moreover, changes adopted in this final rule significantly affect Airbus's decision diagram. As will be detailed in the FAA's decision diagram in AC 20–141B, there is a straightforward approach to evaluating the parameters. First, only those parameters listed in § 121.346(c) need be evaluated to determine whether they are being filtered under the regulatory definition. Next, the certificate holder must determine if the recorded data meet the accuracy requirements of Appendix M. If they do not, the certificate holder needs to decide whether to attempt data reconstruction, or alter the DFDR system to record unfiltered data.

III. Final Rule Language

The structure of the final rule language differs from the proposals. In the proposed rules, we differentiated the group of parameters that could be filtered from those that could not. That distinction is no longer relevant.

Using part 121 as the example, § 121.346(a) contains the definition of filtering. Paragraph (b) states that any parameter may be filtered as long as the recorded value meets all of the requirements of Appendix M. Paragraph (c) specifies the eight critical flight control parameters discussed, and indicates that if any of those parameters are filtered, and because of the filtering does not meet the requirements of Appendix M, then the compliance option of reconstruction described in (c)(1)–(2) is available. A critical parameter that fails to meet Appendix M for some reason other than filtering that can be rectified by reconstruction is considered a violation of Appendix M and is not allowed under any part of the regulation.

This means that if any of the critical parameters is being filtered but nonetheless meets the requirements of Appendix M, no action is required. This is true for all other parameters as well. The only parameters not required to meet the Appendix M requirements are the eight critical ones, and then only if they can be satisfactorily reconstructed as required under paragraph (c) to meet Appendix M requirements.

IV. Regulatory Notice and Analysis

Paperwork Reduction Act

As required by the Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)), the FAA has submitted the information requirements associated with this proposal to the Office of Management and Budget for its review. According to the 1995 amendments to the Paperwork Reduction Act (5 CFR 1320.8(b)(2)(vi)), an agency may not collect or sponsor the collection of information, nor may it impose an information collection requirement unless it displays a currently valid OMB control number. The OMB control number for this information collection will be published in the **Federal Register**, after the Office of Management and Budget approves it.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to comply with International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these regulations.

Regulatory Evaluation, Regulatory Flexibility Determination, International Trade Impact Assessment, and Unfunded Mandates Assessment

Changes to Federal regulations must undergo several economic analyses. First, Executive Order 12866 directs that each Federal agency shall propose or adopt a regulation only upon a reasoned determination that the benefits of the intended regulation justify its costs. Second, the Regulatory Flexibility Act of 1980 (Pub. L. 96–354) requires agencies to analyze the economic impact of regulatory changes on small entities. Third, the Trade Agreements Act (Pub. L. 96–39) prohibits agencies from setting standards that create unnecessary obstacles to the foreign commerce of the United States. In developing U.S. standards, the Trade Act requires agencies to consider international standards and, where appropriate, that they be the basis of U.S. standards. Fourth, the Unfunded Mandates Reform Act of 1995 (Pub. L. 104–4) requires agencies to prepare a written assessment of the costs, benefits, and other effects of proposed or final rules that include a Federal mandate likely to result in the expenditure by State, local, or Tribal governments, in the aggregate, or by the private sector, of $100 million or more annually (adjusted for inflation with base year of 1995). This portion of the preamble contains the FAA's analysis of the economic impacts of this rule.

In conducting these analyses, FAA has determined that this final rule: (1) Has benefits that justify its costs, (2) is not an economically "significant regulatory action" as defined in section 3(f) of Executive Order 12866, (3) is not "significant" as defined in DOT's Regulatory Policies and Procedures; (4) will not have a significant economic impact on a substantial number of small entities; (5) will not create unnecessary obstacles to the foreign commerce of the United States; and (6) will not impose an unfunded mandate on State, local, or Tribal governments, or on the private sector by exceeding the threshold identified above. These analyses are summarized as follows.

Total Benefits and Costs of This Rule

This rule allows certain sensor signals to be filtered only if either (1) the recorded data meet the requirements in the appropriate appendix, or (2) the certificate holder can show that the original sensor signal data can be reconstructed to meet those requirements. The final rule cost will be about $310,000, which has a present value of about $261,000 using a 7 percent discount rate and a present value of about $288,000 using a 3 percent discount rate. The benefits of this rule are that certificate holders will have an alternative means of compliance with the filtering regulations and that the NTSB will have more accurate DFDR data for its accident investigations.

Aviation Industry Affected

The rule applies to each aircraft operated under part 121, 125, or 135 that is required to have a DFDR system. These aircraft are operated primarily by scheduled air carriers and non-scheduled airplane and rotorcraft operators. Aircraft operated under other parts of Title 14 are not affected.

Assumptions

- Discount rate—7%. Sensitivity analysis was performed at 3% and 7% discount rates.
- Period of Analysis—2010–2011.
- Burdened labor rate for engineers and maintenance foremen—$83.12 per hour.[1]
- Rule issued on January 1, 2010.
- Costs are based on 2008 dollars.
- Manufacturers complete DFDR system analysis during 2010.
- Certificate holders report DFDR system information in each aircraft's correlation documentation during 2011.

Changes From the 2006 NPRM to the Final Rule

The 2006 NPRM had proposed to prohibit filtering certain original flight data sensor signals, which may have required certificate holders to redesign their DFDR systems to remove filtering. The final rule allows certain original flight data sensor signals to be filtered if the recorded data meet the accuracy requirements of the applicable appendix or, if they do not meet these requirements, that the certificate holder can show that the original flight data sensor signals can be reconstructed. The reconstruction procedures and test results must be submitted to the FAA and be validated to ensure that the required accuracy is being met and the process is repeatable.

Benefits of This Rule

The Flight 587 accident demonstrated the existence of a filtered data recording problem. The lack of accurate and complete recorded flight data hampered and delayed the accident investigation. The lack of data also introduced an element of uncertainty into the determination of the accident's cause.

Since the 2006 NPRM, comments received from the industry and our increasing understanding of the developments in data recording capability have led the FAA to conclude that data filtering, in and of itself, may not necessarily generate misleading or incomplete information that would inherently compromise an accident investigation. As long as the recorded sensor signal data meet the accuracy specifications, whether the data are filtered is not relevant to the progress of a subsequent accident investigation. However, as previously described, there are eight parameters that are too critical to accident investigation to allow them to be filtered freely. These recorded data may, if filtered, be misleading or incomplete and prevent a timely and thorough accident investigation. This final rule eliminates that possibility by requiring that, for those eight parameters, the aircraft DFDR system either (1) record unfiltered data, (2) record filtered data that meet the required accuracy specifications, or (3) record filtered data that can be reconstructed to recover the original unfiltered sensor signal values. So long as the applicable appendix requirements are met, this rule allows the certificate

[1] GRA, Incorporated, *Economic Values for FAA Investment and Regulatory Decisions, A Guide,* Final Report, September 30, 2008, Table 7–1A: 2008 Mean Burdened Hourly Labor Rates of Aeronautical Engineers and Aviation Mechanics, p. 7–3.

holder to select the lowest cost compliance alternative.

The primary benefit from this rule remains better, quicker, and less expensive accident investigations. Although the public comments provided no quantitative information about the possible benefits of this improved information, the NTSB believes that these benefits exist and the FAA agrees.

Costs of This Rule

Calculation of the costs of this rule begins with the presumption that each affected aircraft's DFDR system already records results that comply with the requirements in Appendix B or M of part 121, Appendix D or E of part 125, or Appendix F of part 135. These regulations were adopted in 1997, with compliance due no later than 2001. If an operator finds that it has aircraft that do not comply with the applicable 1997 appendix requirements, the costs to bring those aircraft into compliance would be a cost of the 1997 rule, not this final rule.

The initial action necessary to comply with this rule is an analysis of the aircraft DFDR system to determine whether data are being filtered. Most certificate holders do not have the technical capabilities to perform an engineering analysis of DFDR systems. However, aircraft manufacturers have the capability and the FAA anticipates that they will perform these analyses and provide the information to the certificate holders. The second action to comply with this rule will be for the certificate holder to create a report indicating the status of each airplane regarding filtering. That data must be maintained as part of the flight data recorder correlation data already required by the regulations.

Industry sources indicated to the FAA that these engineering analyses will require minimal time because most of the work was completed during the aircraft certification and is already in the possession of the manufacturers. For example, GAMA estimated that one of its operators would need 10 hours to complete this analysis for one of its aircraft models. The FAA determined that the average amount of time a manufacturer needs to gather the certification information, review it, complete an analysis and produce a service bulletin (or equivalent) is 25 hours for one aircraft model. Clearly, some of these analyses will take more than 25 hours while others (primarily those for more recently-certificated aircraft models) will simply require the manufacturer to review the results of these recent certification tests. Finally, for operators to comply with the 18-month requirement for reporting the DFDR system status to the FAA, the manufacturers will need to complete this process during 2010, which is the first year after issuing the final rule.

The FAA determined that there are 40 large transport category commercial airplane models affected by this rule. At a cost of $2,078 for each analysis (25 hours at $83.12 per hour), the total cost will be $83,120, which has a present value of $72,600 using a 7 percent discount rate, and a present value of $78,349 using a 3 percent discount rate.

There are 11 other jet airplane models certificated for 10 or more passengers that are used in part 135 non-scheduled operations. At a cost of $2,078 for an analysis, the total cost will be $22,858, which has a present value of $19,955 using a 7 percent discount rate, and a present value of $21,546 using a 3 percent discount rate.

There are 16 turboprop airplane models certificated for 10 or more passengers that are used in part 135 non-scheduled operations. At a cost of $2,078 for each analysis, the total cost will be $33,248, which has a present value of $29,040 using a 7 percent discount rate, and a present value of $31,339 using a 3 percent discount rate.

Finally, there are six rotorcraft models certificated for 10 or more passengers that are used in part 135 non-scheduled operations. At a cost of $2,078 for each analysis, the total cost will be $12,468, which has a present value of $10,890 using a 7 percent discount rate and a present value of $11,752 using a 3 percent discount rate.

Thus, as shown in Table 1, the total cost to manufacturers will be $151,694, which has a present value of $132,495 using a 7 percent discount rate and a present value of $142,986 using a 3 percent discount rate.

TABLE 1—TOTAL COSTS AND PRESENT VALUE COSTS FOR THE MANUFACTURER ANALYSES OF AIRCRAFT BY TYPE OF AIRCRAFT

[In 2008 dollars]

Type of aircraft	Total cost	Present value (at 7 percent)	Present value (at 3 percent)
Airplanes Used in Parts 121 and 125	$83,120	$72,600	$78,349
Jets Used in Part 135	22,858	19,965	21,546
Turboprops Used in Part 135	33,248	29,040	31,339
Rotorcraft Used in Part 135	12,468	10,890	11,752
Total	151,694	132,495	142,986

One issue that arose was the cost to perform these analyses for DFDR systems that have been sufficiently modified to require a supplemental type certificate. The FAA determined that this issue is not significant because such modifications are infrequent and generally do not provide any operational advantage.

However, each certificate holder has the ultimate responsibility to ensure that all of its aircraft DFDR systems are recording sensor signal data that meet the applicable range, resolution, and accuracy specifications. As discussed, although the manufacturer will provide its data to the certificate holder, each certificate holder must indicate, for each of its aircraft, the compliance status of that aircraft, including whether data from the manufacturer applies to individual aircraft. Thus, the certificate holder's incremental compliance cost is the paperwork cost to record the compliance status of its aircraft. The FAA anticipates that this notification will be made during the first half of 2011, the second year after the final rule is issued.

The FAA determined that, on average, it will take a certificate holder's maintenance foreman 15 minutes for a one-time total cost of $20.78 per aircraft to record in an aircraft's correlation documentation whether any data are being filtered.

There were 7,274 airplanes operated under parts 121 and 125 required to

have a DFDR system in 2008.[2] There were 43 jet airplanes, 269 turboprop airplanes and 37 rotorcraft operating in part 135 unscheduled service required to have a DFDR system in 2009.

On that basis, part 121 and 125 operators will incur recordation costs of $151,154, part 135 non-scheduled jet operators will incur recordation costs of $894, part 135 non-scheduled turboprop operators will incur recordation costs of $5,590, and part 135 non-scheduled helicopter operators will incur recordation costs of $769.

Thus, as shown in Table 2, the total cost to operators will be $158,406, which has a present value of $129,306 using a 7 percent discount rate, and a present value of $144,964 using a discount rate of 3 percent.

TABLE 2—TOTAL COSTS AND PRESENT VALUE COSTS FOR OPERATORS TO REPORT COMPLIANCE TO THE FAA DURING 2011

[In 2008 dollars]

Type of certificate holder	Total cost	Present value (at 7 percent)	Present value (at 3 percent)
Parts 121 and 125 Operators	$151,154	$123,386	$138,327
Non-Scheduled Jet	894	729	818
Non-Scheduled Turboprop	5,590	4,563	5,115
Rotorcraft	769	628	704
Total	158,406	129,306	144,964

There is a potential compliance cost if a manufacturer informs an operator that some of its aircraft DFDR systems are recording filtered flight data for any of the eight critical parameters. The final rule requires that if an operator is so informed, then the operator must evaluate each filtered parameter to ensure that the recorded data meet the requirements of the appropriate appendix. The cost of this evaluation is a cost of this final rule. Based on an FAA determination that such an evaluation will take four labor hours at a cost of $83.12 an hour to complete, the cost for an operator to complete an evaluation for each affected parameter on each affected aircraft will be $332.48.

No manufacturer reported to the docket whether any of its aircraft DFDR systems were recording filtered data for any of these eight parameters. As a consequence, the FAA does not know whether there is any such filtered data recording, or the number of affected parameters or the number of affected aircraft DFDR systems.

Therefore, the FAA can only estimate that if there are DFDR systems recording filtered data, it will cost an operator $332.48 to evaluate each affected parameter on each affected aircraft.

Thus, the FAA calculated that, as shown in Table 3, the total cost to comply with this rule is $310,100, which has a present value of $261,801 using a 7 percent discount rate, and a present value of $287,950 using a discount rate of 3 percent.

TABLE 3—TOTAL COSTS AND PRESENT VALUE COSTS TO REPORT COMPLIANCE WITH THE FINAL RULE

[In 2008 dollars]

Type of entity	Total cost	Present value (at 7 percent)	Present value (at 3 percent)
Manufacturer	$151,694	$132,495	$142,986
Operator	158,406	129,306	144,964
Total	310,100	261,801	287,950

As previously discussed, this total cost does not include any potential operator costs to determine that any filtered data meets the requirements of the appropriate appendix because the FAA does not know whether or to what extent the DFDR systems are recording filtered data.

If a DFDR system is recording data for parameters 12 through 17, 42, or 88 that do not meet the requirements of Appendix M because of filtering, the certificate holder has the choice of two methods of compliance. One method would be to remove the filtering. The other method would be for the certificate holder to demonstrate that the original sensor signal data (values) can be acceptably reconstructed using a valid, repeatable procedure. The cost of either action is a cost to comply with the existing standard and, therefore, is not a cost of this rule.

In fact, this rule, by allowing an alternative to removing the filtering, may reduce the costs to bring out-of-compliance aircraft into compliance with the appropriate appendix. We asked for cost information for these actions in the SNPRM, but received no data.

Benefit Cost Analysis

The FAA believes that the rule will provide accident investigators with the more accurate and less ambiguous data necessary to determine the causes of aircraft accidents in a more timely and less expensive way. It also provides operators with a less costly means than the 2006 NPRM to comply with the applicable requirements. As a result, the FAA has determined that the benefits from this rule are greater than the costs.

Regulatory Flexibility Analysis

The Regulatory Flexibility Act of 1980 (Pub. L. 96–354) (RFA) establishes "as a principle of regulatory issuance that

[2] *FAA Aerospace Forecast Fiscal Years 2009–2025,* Tables 20, 21, and 26, pp. 79, 80, and 85.

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-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 rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 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.

In the SNPRM, the FAA requested information specific to small entities, but received none. In the regulatory evaluation, the FAA calculated that the cost to create a record of the compliance status of each aircraft would be $20.78, which is a minimal cost to a small entity. Subsequent costs to bring a non-compliant aircraft into compliance may be attributable to the 1997 regulation. This final rule may reduce some of those costs by allowing the certificate holder to select a compliance alternative that was not previously available.

Therefore, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

International Trade Analysis

The Trade Agreements Act of 1979 (Pub. L. 96–39), as amended by the Uruguay Round Agreements Act (Pub. L. 103–465), prohibits Federal agencies from establishing any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of standards is not considered unnecessary obstacles to the foreign commerce of the United States, so long as the standards have a legitimate domestic objective, such the protection of safety, and do not operate in a manner that excludes imports that meet this objective. The statute also requires consideration of international standards and, where appropriate, that they be the basis for U.S. standards. The FAA notes the purpose is to ensure the safety of the American public, and has assessed the effects of this rule to ensure it does not exclude imports that meet this objective. As a result, this final rule is not considered as creating an unnecessary obstacle to foreign commerce.

Unfunded Mandates Act

Title II of the Unfunded Mandates Reform Act of 1995 (Pub. L. 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 $136.1 million in lieu of $100 million.

This final rule does not contain such a mandate; therefore, the requirements of Title II of the Act do not apply.

Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action would not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have federalism implications.

Environmental Analysis

FAA Order 1050.1E identifies FAA actions that are categorically excluded from preparation of an environmental assessment or environmental impact statement under the National Environmental Policy Act in the absence of extraordinary circumstances. The FAA has determined this rulemaking qualifies for the categorical exclusion identified in Chapter 3, paragraph 312f and involves no extraordinary circumstances.

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this final rule under Executive Order 13211, Actions Concerning Regulations that Significantly Affect Energy Supply, Distribution, or Use (May 18, 2001). We have determined that it is not a "significant energy action" under the executive order because it is not a "significant regulatory action" under Executive Order 12866, and it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the FAA, when modifying its regulations in a manner affecting intrastate aviation in Alaska, to consider the extent to which Alaska is not served by transportation modes other than aviation, and to establish appropriate regulatory distinctions. In the NPRM, we requested comments on whether the proposed rule should apply differently to intrastate operations in Alaska. We did not receive any comments, and we have determined, based on the administrative record of this rulemaking, that there is no need to make any regulatory distinctions applicable to intrastate aviation in Alaska.

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/;* 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 SW., Washington, DC 20591, or by calling (202) 267–9680. Make sure to identify the docket number or amendment number of this rulemaking.

You may search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, *etc.*). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477–78) or you may visit *http://DocketsInfo.dot.gov.*

Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with

small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at *http://www.faa.gov/regulations_policies/rulemaking/sbre_act/*.

List of Subjects in 14 CFR Parts 121, 125, and 135

Air carriers, Aircraft, Aviation safety, Safety, Transportation.

The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of Title 14, Code of Federal Regulations, as follows:

PART 121—OPERATING REQUIREMENTS: DOMESTIC, FLAG, AND SUPPLEMENTAL OPERATIONS

■ 1. The authority citation for part 121 continues to read as follows:

Authority: 49 U.S.C. 106(g), 1153, 40101, 40102, 40103, 40113, 41721, 44105, 44106, 44111, 44701–44717, 44722, 44901, 44903, 44904, 44906, 44912, 44914, 44936, 44938, 46103, 46105.

■ 2. Revise § 121.344a(e) to read as follows:

§ 121.344a Digital flight data recorders for 10–19 seat airplanes.

* * * * *

(e) All airplanes subject to this section are also subject to the requirements and exceptions stated in § 121.344(g) through (k) and § 121.346.

* * * * *

■ 3. Add a new § 121.346 to read as follows:

§ 121.346 Flight data recorders: filtered data.

(a) A flight data signal is filtered when an original sensor signal has been changed in any way, other than changes necessary to:

(1) Accomplish analog to digital conversion of the signal;

(2) Format a digital signal to be DFDR compatible; or

(3) Eliminate a high frequency component of a signal that is outside the operational bandwidth of the sensor.

(b) An original sensor signal for any flight recorder parameter required to be recorded under § 121.344 may be filtered only if the recorded signal value continues to meet the requirements of Appendix B or M of this part, as applicable.

(c) For a parameter described in § 121.344(a) (12) through (17), (42), or (88), or the corresponding parameter in Appendix B of this part, if the recorded signal value is filtered and does not meet the requirements of Appendix B or M of this part, as applicable, the certificate holder must:

(1) Remove the filtering and ensure that the recorded signal value meets the requirements of Appendix B or M of this part, as applicable; or

(2) Demonstrate by test and analysis that the original sensor signal value can be reconstructed from the recorded data. This demonstration requires that:

(i) The FAA determine that the procedure and the test results submitted by the certificate holder as its compliance with paragraph (c)(2) of this section are repeatable; and

(ii) The certificate holder maintains documentation of the procedure required to reconstruct the original sensor signal value. This documentation is also subject to the requirements of § 121.344(i).

(d) *Compliance.* Compliance is required as follows:

(1) No later than October 20, 2011, each operator must determine, for each airplane on its operations specifications, whether the airplane's DFDR system is filtering any of the parameters listed in paragraph (c) of this section. The operator must create a record of this determination for each airplane it operates, and maintain it as part of the correlation documentation required by § 121.344(j)(3) of this part.

(2) For airplanes that are not filtering any listed parameter, no further action is required unless the airplane's DFDR system is modified in a manner that would cause it to meet the definition of filtering on any listed parameter.

(3) For airplanes found to be filtering a parameter listed in paragraph (c) of this section, the operator must either:

(i) No later than April 21, 2014, remove the filtering; or

(ii) No later than April 22, 2013, submit the necessary procedure and test results required by paragraph (c)(2) of this section.

(4) After April 21, 2014, no aircraft flight data recording system may filter any parameter listed in paragraph (c) of this section that does not meet the requirements of Appendix B or M of this part, unless the certificate holder possesses test and analysis procedures and the test results that have been approved by the FAA. All records of tests, analysis and procedures used to comply with this section must be maintained as part of the correlation documentation required by § 121.344(j)(3) of this part.

■ 4. Amend Appendix M to part 121 by revising the introductory text to read as follows:

Appendix M to Part 121—Airplane Flight Recorder Specifications

The recorded values must meet the designated range, resolution and accuracy requirements during static and dynamic conditions. Dynamic condition means the parameter is experiencing change at the maximum rate attainable, including the maximum rate of reversal. All data recorded must be correlated in time to within one second.

* * * * *

PART 125—CERTIFICATION AND OPERATIONS: AIRPLANES HAVING A SEATING CAPACITY OF 20 OR MORE PASSENGERS OR A MAXIMUM PAYLOAD CAPACITY OF 6,000 POUNDS OR MORE; AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

■ 5. The authority citation for part 125 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44705, 44710–44711, 44713, 44716–44717, 44722.

■ 6. Add a new § 125.228 in Subpart F to read as follows:

§ 125.228 Flight data recorders: filtered data.

(a) A flight data signal is filtered when an original sensor signal has been changed in any way, other than changes necessary to:

(1) Accomplish analog to digital conversion of the signal;

(2) Format a digital signal to be DFDR compatible; or

(3) Eliminate a high frequency component of a signal that is outside the operational bandwidth of the sensor.

(b) An original sensor signal for any flight recorder parameter required to be recorded under § 125.226 may be filtered only if the recorded signal value continues to meet the requirements of Appendix D or E of this part, as applicable.

(c) For a parameter described in § 125.226(a) (12) through (17), (42), or (88), or the corresponding parameter in Appendix D of this part, if the recorded signal value is filtered and does not meet the requirements of Appendix D or E of this part, as applicable, the certificate holder must:

(1) Remove the filtering and ensure that the recorded signal value meets the requirements of Appendix D or E of this part, as applicable; or

(2) Demonstrate by test and analysis that the original sensor signal value can be reconstructed from the recorded data. This demonstration requires that:

(i) The FAA determine that the procedure and the test results submitted by the certificate holder as its compliance with paragraph (c)(2) of this section are repeatable; and

(ii) The certificate holder maintains documentation of the procedure required to reconstruct the original sensor signal value. This documentation is also subject to the requirements of § 125.226(i).

(d) *Compliance.* Compliance is required as follows:

(1) No later than October 20, 2011, each operator must determine, for each airplane it operates, whether the airplane's DFDR system is filtering any of the parameters listed in paragraph (c) of this section. The operator must create a record of this determination for each airplane it operates, and maintain it as part of the correlation documentation required by § 125.226(j)(3) of this part.

(2) For airplanes that are not filtering any listed parameter, no further action is required unless the airplane's DFDR system is modified in a manner that would cause it to meet the definition of filtering on any listed parameter.

(3) For airplanes found to be filtering a parameter listed in paragraph (c) of this section, the operator must either:

(i) No later than April 21, 2014, remove the filtering; or

(ii) No later than April 22, 2013, submit the necessary procedure and test results required by paragraph (c)(2) of this section.

(4) After April 21, 2014, no aircraft flight data recording system may filter any parameter listed in paragraph (c) of this section that does not meet the requirements of Appendix D or E of this part, unless the certificate holder possesses test and analysis procedures and the test results that have been approved by the FAA. All records of tests, analysis and procedures used to comply with this section must be maintained as part of the correlation documentation required by § 125.226(j)(3) of this part.

■ 7. Amend Appendix E to part 125 by revising the introductory to read as follows:

Appendix E to Part 125—Airplane Flight Recorder Specifications

The recorded values must meet the designated range, resolution and accuracy requirements during static and dynamic conditions. Dynamic condition means the parameter is experiencing change at the maximum rate attainable, including the maximum rate of reversal. All data recorded must be correlated in time to within one second.

* * * * *

PART 135—OPERATING REQUIREMENTS: COMMUTER AND ON DEMAND OPERATIONS AND RULES GOVERNING PERSONS ON BOARD SUCH AIRCRAFT

■ 8. The authority citation for part 135 continues to read as follows:

Authority: 49 U.S.C. 106(g), 41706, 44113, 44701–44702, 44705, 44709, 44711–44713, 44715–44717, 44722.

■ 9. Add a new § 135.156 to read as follows:

§ 135.156 Flight data recorders: filtered data.

(a) A flight data signal is filtered when an original sensor signal has been changed in any way, other than changes necessary to:

(1) Accomplish analog to digital conversion of the signal;

(2) Format a digital signal to be DFDR compatible; or

(3) Eliminate a high frequency component of a signal that is outside the operational bandwidth of the sensor.

(b) An original sensor signal for any flight recorder parameter required to be recorded under § 135.152 may be filtered only if the recorded signal value continues to meet the requirements of Appendix D or F of this part, as applicable.

(c) For a parameter described in § 135.152(h)(12) through (17), (42), or (88), or the corresponding parameter in Appendix D of this part, if the recorded signal value is filtered and does not meet the requirements of Appendix D or F of this part, as applicable, the certificate holder must:

(1) Remove the filtering and ensure that the recorded signal value meets the requirements of Appendix D or F of this part, as applicable; or

(2) Demonstrate by test and analysis that the original sensor signal value can be reconstructed from the recorded data. This demonstration requires that:

(i) The FAA determine that the procedure and test results submitted by the certificate holder as its compliance with paragraph (c)(2) of this section are repeatable; and

(ii) The certificate holder maintains documentation of the procedure required to reconstruct the original sensor signal value. This documentation is also subject to the requirements of § 135.152(e).

(d) *Compliance.* Compliance is required as follows:

(1) No later than October 20, 2011, each operator must determine, for each aircraft on its operations specifications, whether the aircraft's DFDR system is filtering any of the parameters listed in paragraph (c) of this section. The operator must create a record of this determination for each aircraft it operates, and maintain it as part of the correlation documentation required by § 135.152 (f)(1)(iii) or (f)(2)(iii) of this part as applicable.

(2) For aircraft that are not filtering any listed parameter, no further action is required unless the aircraft's DFDR system is modified in a manner that would cause it to meet the definition of filtering on any listed parameter.

(3) For aircraft found to be filtering a parameter listed in paragraph (c) of this section the operator must either:

(i) No later than April 21, 2014, remove the filtering; or

(ii) No later than April 22, 2013, submit the necessary procedure and test results required by paragraph (c)(2) of this section.

(4) After April 21, 2014, no aircraft flight data recording system may filter any parameter listed in paragraph (c) of this section that does not meet the requirements of Appendix D or F of this part, unless the certificate holder possesses test and analysis procedures and the test results that have been approved by the FAA. All records of tests, analysis and procedures used to comply with this section must be maintained as part of the correlation documentation required by § 135.152 (f)(1)(iii) or (f)(2)(iii) of this part as applicable.

■ 10. Amend Appendix F to part 135 by revising the introductory text to read as follows:

Appendix F to Part 135—Airplane Flight Recorder Specifications

The recorded values must meet the designated range, resolution and accuracy requirements during static and dynamic conditions. Dynamic condition means the parameter is experiencing change at the maximum rate attainable, including the maximum rate of reversal. All data recorded must be correlated in time to within one second.

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Issued in Washington, DC, on February 5, 2010.

J. Randolph Babbitt,

Administrator.

[FR Doc. 2010–3321 Filed 2–18–10; 8:45 am]

BILLING CODE 4910–13–P