Proposed Rules

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This section of the FEDERAL REGISTER contains notices to the public of the proposed issuance of rules and regulations. The purpose of these notices is to give interested persons an opportunity to participate in the rule making prior to the adoption of the final rules.

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Parts 27 and 29

[Docket No. FAA–2009–0660; Notice No. 09–12]

RIN 2120–AJ52

Damage Tolerance and Fatigue Evaluation of Composite Rotorcraft Structures

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: This proposal would revise airworthiness standards for type certification requirements of normal and transport category rotorcraft. The amendment would require evaluation of fatigue and residual static strength of composite rotorcraft structures using a damage tolerance evaluation, or a fatigue evaluation, if the applicant establishes that a damage tolerance evaluation is impractical. The amendment would address advances in composite structures technology and provide internationally harmonized standards.

DATES: Send your comments on or before April 6, 2010

ADDRESSES: You may send comments identified by Docket Number FAA–2009–0660 using any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov* and follow the online instructions for sending your comments electronically.
- *Mail:* Send comments to Docket Operations, M–30; U.S. Department of Transportation, 1200 New Jersey Avenue, SE., Room W12–140, West Building Ground Floor, Washington, DC 20590–0001.
- *Hand Delivery or Courier:* Take comments to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* Fax comments to Docket Operations at 202–493–2251.

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

Docket: To read documents or comments received, go to *http://www.regulations.gov* and follow the online instructions for accessing the docket. Or, go to Docket Operations in Room W12–140 of the West Building Ground Floor at 1200 New Jersey Avenue, SE., Washington, DC, between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.

FOR FURTHER INFORMATION CONTACT: For technical questions concerning this proposed rule contact Sharon Y. Miles, Regulations and Policy Group, Rotorcraft Directorate, ASW–111, Federal Aviation Administration, 2601 Meacham Boulevard, Fort Worth, Texas 76137–0111; telephone (817) 222–5122; facsimile (817) 222–5961; e-mail *sharon.y.miles@faa.gov*. For legal questions concerning this proposed rule contact Steve C. Harold, Directorate Counsel, ASW–7G1, Federal Aviation Administration, 2601 Meacham Boulevard, Fort Worth, Texas 76137–0007, telephone (817) 222–5099; facsimile (817) 222–5945, e-mail *steve.c.harold@faa.gov*.

SUPPLEMENTARY INFORMATION: Later in this preamble under the Additional Information section, we discuss how you can comment on this proposal and how we will handle your comments. Included in this discussion is related information about the docket handling. We also discuss how you can get a copy of related rulemaking documents.

Authority for This Rulemaking

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

This rulemaking is issued under the authority described in Subtitle VII, Part A, Subpart III, Section 44701, ''General Requirements,'' Section 44702, ''Issuance of Certificates,'' and Section 44704, ''Type Certificates, Production Certificates, and Airworthiness Certificates.'' Under Section 44701, the FAA is charged with prescribing regulations and minimum standards for practices, methods, and procedures the Administrator finds necessary for safety in air commerce. Under Section 44702, the Administrator may issue various certificates including type certificates, production certificates, air agency certificates, and airworthiness certificates. Under Section 44704, the Administrator must issue type certificates for aircraft, aircraft engines, propellers, and specified appliances when the Administrator finds the product is properly designed and manufactured, performs properly, and meets the regulations and minimum standards prescribed under section 44701(a). This regulation is within the scope of these authorities because it would promote safety by updating the existing minimum prescribed standards, used during the type certification process, to address advances in composite structural fatigue substantiation technology. It would also harmonize this standard with international standards for evaluating the fatigue strength of normal and transport category rotorcraft composite primary structural elements.

Background and Statement of the Issues

The evolution of composite technology used in rotorcraft structures is advancing rapidly. These rapid changes with the increased use of composites in rotorcraft structures, issues discovered during certification of composite structures, and service experiences of composite rotorcraft structures over the last 25 years have caused us to reconsider the current regulations and guidance materials for damage tolerance and fatigue evaluation and to address the state of technology in composite structures. The current certification process is based on a broad interpretation of metallic fatigue

substantiation and the design and construction airworthiness standards. However, composite and metal structures are different. Composites are complex materials that have unique advantages in fatigue strength, weight, and tolerance to damage. The methodologies for evaluating metallic structures are not necessarily suitable for composite structures. Since composite structures differ from metallic structures, the current regulations, §§ 27.571 and 29.571, do not adequately provide the fatigue certification requirements for composite rotorcraft structures.

This may lead to inconsistent interpretations from one rotorcraft certification project to another, resulting in different burdens on industry to substantiate their composite rotorcraft structures. It has also caused confusion for some certification applicants. These applicants state there is no clear, complete guidance for certification of composite rotorcraft structures.

To address these concerns, the FAA tasked the Aviation Rulemaking Advisory Committee (ARAC) [1] through its Composite Rotorcraft Structure working group to provide advice and recommendations as follows:

- Recommend revisions to FAR/JAR 27 and 29 for composite structures that are harmonized.
- Evaluate and recommend, as appropriate, regulations, advisory material, and related guidance to achieve the goal of improved tolerance to flaws and defects in composite structure with methodology and procedures that are practical and appropriate to rotorcraft.

This proposed rule is based on the ARAC's recommendations to the FAA. The recommendations have been placed in the docket for this rulemaking.

Related Activity

At the same time the ARAC was tasked with providing advice and recommendations for composite rotorcraft structures, it was also tasked with providing advice and recommendations for metallic rotorcraft structures. Because of the unique characteristics and structural capabilities of composite structures, we believe a separate rule is needed for the damage tolerance and fatigue evaluations of rotorcraft composite structures. In response to the ARAC recommendations for improved standards for metallic structures, the FAA is developing an NPRM entitled Fatigue Tolerance Evaluation of Metallic Structures.

General Discussion of Proposals

Composite structures present unique material behaviors and react differently than metallic to damage and loading conditions. This separate rulemaking action for the damage tolerance and fatigue evaluation of composite structures is proposed to address the type certification requirements for substantiating and certifying composite rotorcraft structures including different aspects of the evaluation for the most critical issues for each class of materials. These proposals address the unique characteristics of composite materials and would enable applicants to evaluate these types of materials in a different manner from those of the traditional metallic materials.

The proposed changes would clarify the certification standards in areas of frequent non-standardization and misinterpretation. These proposals are intended to address fatigue damage tolerance conditions that can reduce structural strength. In composites, low cycle fatigue often yields minimal damage growth, whereas accidental damage from impact can immediately reduce residual structural strength. Conversely, in metals, any critical damage to the structure would be sensitive to cyclic fatigue loads.

These proposals also address material and process variability and environmental effects. The FAA proposes a strength requirement for ultimate loads that would be applied when maximum acceptable manufacturing defects and service damage are present. These proposals would provide an exception to a damage tolerance evaluation if the applicant establishes impracticability and, in that instance, would allow a fatigue evaluation for some rotorcraft structures and damage scenarios based on retirement times instead of inspection intervals more commonly associated with damage tolerance standards. Under this proposal, an applicant could demonstrate that certain damage would not grow or does not grow beyond a certain threshold or size, and that the damaged structure could still carry ultimate loads. In this instance, an inspection may not be necessary and the structure could be assigned a retirement life instead of a required inspection program. Further, this proposal would require an applicant to conduct a threat assessment, which is associated with the service history of composite structures.

The proposals consider varying types of damage, loading conditions, threat assessments, manufacturing defects, and residual strength associated with composite structures. In developing these proposals, we have recognized that it may be impractical within the limits of geometry, inspectability, or good design practice to evaluate all the composite structures of a rotorcraft using a damage tolerance evaluation. Therefore, this proposal allows for a fatigue evaluation of particular rotorcraft composite structures under §§ 27.573(e) and 29.573(e) where appropriate, instead of requiring a damage tolerance evaluation for particular structures if the applicant can establish that an impracticability exists. As part of the approval process for fatigue evaluation of a particular rotorcraft composite structure, the applicant would be required to identify the Principal Structural Elements (PSEs) and the types of damage considered, establish supplemental procedures to minimize the risk of catastrophic failure associated with those types of damage, and include procedures in the Airworthiness Limitation section of the Instructions for Continued Airworthiness. The proposed requirements would minimize the risk of catastrophic failure of composite structures used on rotorcraft certificated in accordance with part 27 and part 29 standards.

Key Provisions in the New Rule

Some of the proposed requirements for evaluating composite structures came from the current § 29.571 standards. These requirements in the evaluation process include certain steps, such as identification of the PSEs, the in-flight measurements of loads, and the use of loading spectra as severe as those expected in-service. This proposal adds more detailed steps and does not refer to the current flaw tolerant safe-life and fail-safe evaluations because there are more suitable ways of describing each approach under damage tolerance. Further, these proposals do not refer to the traditional safe-life method because composites have sensitivities to defects and damage that must be considered in design and certification testing that make the traditional safe-life method inappropriate.

These proposals would revise the standards for determining inspection intervals and retirement times based on results of damage tolerance and fatigue evaluation. Currently, the minimum residual structural strength requirement for any damage or defect that can be found by inspection is tied to limit loads (maximum loads to be expected in service). This proposal would link the required residual structural strength to

[1] Published in the **Federal Register**, April 5, 2000 (65 FR 17936).

the probability of a given damage type, inspection interval, and damage detectability. This link is necessary for at least two reasons. First, one of the more critical threats—impact damage—could immediately lower residual structural strength well below ultimate loads (limit loads multiplied by prescribed factors of safety) if it occurs. The proposal would ensure, as the residual structural strength is lowered, the earlier damage would be detected and repaired. Inspections would be required that would be frequent and comprehensive enough to reveal any damage or defect growth to minimize the time that the rotorcraft might be operated at less than an ultimate load capability. Second, this proposal would address rare damage (such as a high-energy, blunt impact) that is not detectable with the currently prescribed inspection schemes issued for aircraft in operational service. Although such damage may have a low probability of occurring, this proposal would require that sufficient residual structural strength exists to compensate for such damage.

These proposals would require that all PSEs, the failure of which could result in catastrophic failure of the rotorcraft, meet ultimate load residual structural strength requirements or require that a retirement time be established if there could be any damage that may not be found by a maintenance inspection. Under this proposal, an applicant would establish a retirement time to assess the damage that may not be found by inspection or to eliminate the burden of the repeated inspections by the rotorcraft owners. For damage detectable by inspection, the proposal would establish a limit load requirement to repair and restore the structure to its ultimate strength capability.

The FAA proposes to include all PSE assessments for damage threats, residual strength and fatigue characteristics to the list of requirements for inspection intervals or replacement times as stated in proposed §§ 27.573(d)(1) and 29.573(d)(1). As a minimum, the fatigue evaluation would include the PSEs of the:

—Airframe,
—Main and tail rotor drive systems,
—Main and tail rotor blades and hubs,
—Rotor controls,
—Fixed and movable control surfaces,
—Engine and transmission mountings (provided by the airframe manufacturer), and
—Landing gear and other parts; as well as performing damage tolerance evaluations of the strength of composite:
—Detail design points and
—Fabrication techniques considered critical by the FAA to avoid catastrophic failure due to static or fatigue loads.

The proposal would require consideration of the effects of fatigue damage on stiffness, dynamic behavior, loads, and functional performance of composite structures. In the existing rule, such requirements are limited to fail-safe evaluations. These characteristics are not considered to be a serious threat to residual structural strength.

The FAA recognizes there may be limited cases in which a damage tolerance evaluation may be impractical. In these rare cases, the applicant would be required to identify the nature of the evaluation and provide a justification to the FAA for the determination of its impracticality. The justification would support the specific types of damage to the PSE that would qualify for a fatigue evaluation. Finally, the proposal would require the applicant to establish replacement times, structural inspection intervals, and related structural inspection procedures to minimize the risk of catastrophic failure because of such damage. The required replacement times, inspection intervals, and structural inspections would be included in the Instructions for Continued Airworthiness as required by §§ 27.1529 and 29.1529.

Additionally, the FAA recognizes that rare types of damage, such as high-energy, blunt impacts may not be uncovered as part of a base field inspection during scheduled maintenance inspection intervals. This proposal would require that the applicant substantiate sufficient residual structural strength to maintain an adequate level of safety in the event of an occurrence of rare damage. Supplemental procedures may be required to adequately address rare impact damage.

Airworthiness Limitations Section (Appendix A to Parts 27 and 29)

This proposal would require the mandatory replacement times, structural inspection intervals, and related structural inspection procedures produced under the requirements of §§ 27.571 and 29.571, the new §§ 27.573 and 29.573, and any other similar requirement for type certification be included in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness.

Paperwork Reduction Act

This proposal contains the following new information collection requirements. As required by 44 U.S.C. 3507(d) of the Paperwork Reduction Act of 1995, as implemented by 5 CFR part 1320, the FAA has submitted the information requirements associated with this proposal to the Office of Management and Budget (OMB) for review.

Title: Damage Tolerance and Fatigue Evaluation of Composite Rotorcraft Structures.

Summary: This proposal would add new certification standards for normal and transport category rotorcraft to address advances in structural damage tolerance and fatigue substantiation technology for composite rotorcraft structures. These proposals would increase the current minimum safety standards to require compliance with certain current industry practices and FAA policies that would result in higher safety standards, and would result in harmonized international standards. These proposals would help ensure that if damage occurs to composite structures during manufacturing or within the operational life of the rotorcraft, the remaining structure could withstand fatigue loads that are likely to occur, without failure, until the damage is detected. The damaged structure must then be repaired to restore ultimate load capability, or the part must be replaced. Proposed §§ 27.573 and 29.573 would require that applicants get FAA approval of their proposed methods for complying with the certification requirements for damage tolerance and fatigue evaluation of composite structures.

Use of information: The required damage tolerance and fatigue evaluation information would be determined for principal composite structural elements or components, detail design points, and fabrication techniques and would be collected from rotorcraft certification applicants. The FAA would use the approval process for the Applicant's submitted compliance methodology to determine whether the proposed methods were sufficient to comply with the certification requirements for damage tolerance and fatigue evaluation of composite structures. The FAA also would use the approval process for the Applicant's submitted compliance methodology to determine if the rotorcraft has any unsafe features in the composite structures.

Respondents: The likely respondents to this proposed damage tolerance and fatigue evaluation information are applicants requesting type certification of composite structures. We anticipate about 10 normal and transport category rotorcraft certification applicants (including supplemental type certificate

applicants) over the 27-year analysis period or about 0.4 per year.

Frequency: The frequency of determining the damage tolerance and fatigue evaluation methodologies would depend on how often an applicant seeks certification of a composite structure. This compliance methodology would be provided during each certification. We anticipate 16.5 certifications over the 27 year analysis period or about 0.6 per year.

Annual Burden Estimate: The compliance methodology would be required to be submitted and approved during each certification of a composite rotorcraft structure. We anticipate there would be 0.6 certifications each year and it would take 182 hours to submit and approve the compliance methodology for each certification, for a total annual time burden of 109 hours. We anticipate that submitting and approving the compliance methodology for each certification would cost $100.00 per hour. Therefore, the estimated total annual cost burden would be $10,900.00.

The agency is asking for comments to—

(1) evaluate whether the proposed information requirement is necessary for the proper performance of the functions of the agency, including whether the information will have practical utility;

(2) evaluate the accuracy of the agency's estimate of the burden;

(3) improve the quality, utility, and clarity of the information to be collected; and

(4) minimize the burden of collecting information on those who are to respond, by using appropriate automated, electronic, mechanical, or other technological collection techniques or other forms of information technology.

Individuals and organizations may submit comments on the information collection requirement by March 8, 2010, and should direct them to the address listed in the **ADDRESSES** section. Comments also should be submitted to the Office of Management and Budget, Office of Information and Regulatory Affairs, Attention: Desk Officer for FAA, New Executive Building, Room 10202, 725 17th Street, NW., Washington, DC 20053.

According to the 1995 amendments to the Paperwork Reduction Act and 5 CFR 1320.8(b)(3)(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 approval.

International Compatibility

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA's policy to comply with International Civil Aviation Organization (ICAO) Standards to the maximum extent practicable. The FAA has determined that the proposed rule is consistent with the ICAO standard in ICAO Annex 8, Part IV.

European Aviation Safety Agency

The European Aviation Safety Agency (EASA) was established by the European Community to develop standards to ensure safety and environmental protection, oversee uniform application of those standards, and promote them internationally. EASA formally became responsible for certification of aircraft, engines, parts, and appliances on September 28, 2003. The FAA and EASA are coordinating their rulemaking efforts to facilitate harmonized standards for evaluating the fatigue strength of composite rotorcraft structures.

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 (Public Law 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, this 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 summarizes the FAA's analysis of the economic impacts of this proposed rule. We suggest readers seeking greater detail read the full regulatory evaluation, a copy of which we have placed in the docket for this rulemaking.

In conducting these analyses, the FAA has determined that this proposed 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) Has been determined by the Office of Management and Budget to be a ''non-significant regulatory action;''

(4) Is not ''significant'' as defined in DOT's Regulatory Policies and Procedures;

(5) Would not have a significant economic impact on a substantial number of small entities;

(6) Would not have a significant effect on international trade; and

(7) Would not impose an unfunded mandate on State, local, or tribal governments by exceeding the monetary threshold identified.

These analyses are summarized below.

Total Benefits and Costs of This Rulemaking

The estimated total cost of this proposed rule is about $713,000 ($392,000 in present value, discounted at 7% for 27 years).

Who is Potentially Affected by this Rulemaking?

- Manufacturers of U.S.-registered part 27 and part 29 rotorcraft, and
- Operators of part 27 and part 29 rotorcraft.

Our Cost Assumptions and Sources of Information.

- Discount rate—7%
- Period of analysis of 27 years equals the 27 years of National Transportation Safety Board accident history. During this period, manufacturers will seek new certifications for 10.5 part 27 rotorcraft and six part 29 rotorcraft.

This proposed rule consolidates FAA and industry past activities including special conditions, advisory circulars, and industry practice regarding the use of composites on rotorcraft. The benefits of this action exceed the small costs of this proposed rule.

We estimate the costs of this proposed rule to be about $713,000 ($392,000 in present value) over the 27-year analysis period. Manufacturers of 14 CFR part 27 rotorcraft would incur costs of $101,000 ($55,000 in present value) and manufacturers of 14 CFR part 29 helicopters would incur costs of $612,000 ($337,000 in present value).

Regulatory Flexibility Determination

The Regulatory Flexibility Act of 1980 (RFA) establishes ''as a principle of

regulatory issuance that agencies shall endeavor, consistent with the objective of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the business, organizations, and governmental jurisdictions subject to regulation.'' To observe that principle, the RFA requires agencies to solicit and consider flexible regulatory proposals and to explain the rationale for their actions. 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 proposed or final 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 Act.

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

This proposed rule would affect rotorcraft manufacturers and rotorcraft operators. Therefore, the effect on potential small entities is analyzed separately for helicopter manufacturers and operators.

Part 27 Helicopter Manufacturers

Size Standards

Size standards for small entities are published by the Small Business Administration (SBA) on their Web site at *http://www.sba.gov/size.* The size standards used herein are from ''SBA U.S. Small Business Administration, Table of Small Business Size Standards, Matched to North American Industry Classification System Codes.'' The table is effective August 22, 2008 and uses the 2007 NAICS codes.

Helicopter manufacturers are listed in the above-referenced table under Sector 31–33—Manufacturing; Subsector 336—Transportation Equipment Manufacturing; NAICS Code 336411—Aircraft Manufacturing. The small entity size standard is 1,500 employees.

Table R1 shows there are six U.S. part 27 helicopter manufacturers that produce composite helicopters. MD Helicopters, with 400 employees, is the only part 27 helicopter manufacturer to qualify as a small entity. It is estimated that MD Helicopters has annual revenues of $175,000,000. The cost of this rule for one part 27 helicopter certification for a part 27 manufacturer is estimated to be $9,600 over 27 years, and the total number of such certifications is estimated at 10.5, if only one of these were performed by MD Helicopters, the cost would be equivalent to 0.005 percent of their total revenue, which would not represent a significant cost. Therefore, it is not anticipated that this proposed rule would have a significant economic impact on a substantial number of part 27 helicopter manufacturers.

TABLE R1—U.S. PART 27 HELICOPTER MANUFACTURERS

Manufacturer					Annual		
Number	Name	Ultimate owner	Employees	Small entity	Revenues (AR)	Proposal costs (PC)	% PC of AR
1	Agusta (A)	Finmeccanica	73,000	No	€15,037,000	N.A.	N.A.
2	Bell Helicopter (B)	Textron	42,000	No	$14,200,000,000	N.A.	N.A.
3	Eurocopter (C)	EADS	118,000	No	€43,3000,000,000	N.A.	N.A.
4	Kaman Aerospace (D)	Kaman Corp	4,000	No	$1,200,000,000	N.A.	N.A.
5	MD Helicopters (E)(F)	None	400	Yes	$175,000,000	$9,600	0.01%
6	Sikorsky (G)	UTC	223,100	No	$58,700,000,000	N.A.	N.A.
7	Robinson Helicopters (H).						

Notes:

(A) http://www.finmeccanica.com
(B) http://www.Textron.com/about/company
(C) http://www.eads.com
(D) http://www.kaman.com
(E) http://www.linkdin.com
(F) http://www.jigsaw.com/id55718/md—helicopters—company.xhtml (Average of range of $100–$250 million) Cost is based on one helicopter certifcation during the analysis period.
(G) http://www.utc.com/about—utc/fast—facts.Ihtml
(H) Robinson Helicopters is not included because it produces only metallic helicopters and is not expected to produce composite heliopters in the future.

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Part 29 Helicopter Manufacturers

Size Standards

Size standards for part 29 manufacturers are the same as the size standards for part 27 manufacturers.

Table R2 shows there are four U.S. part 29 helicopter manufacturers currently producing helicopters. None of these manufacturers qualifies as a small entity. Therefore, it is not anticipated that this proposed rule would have a significant economic impact on a substantial number of part 29 helicopter manufacturers.

TABLE R1—U.S. PART 29 HELICOPTER MANUFACTURERS

Manufacturer					Annual		
Number	Name	Ultimate owner	Employees	Small entity	Revenues (AR)	Proposal costs (PC)	% PC of AR
1	Agusta (A)	Finmeccanica	73,000	No	€15,037,000	N.A.	N.A.
2	Bell Helicopter (B)	Textron	42,000	No	$14,200,000,000	N.A.	N.A.
3	Eurocopter (C)	EADS	118,000	No	€43,3000,000,000	N.A.	N.A.
4	Sikorsky (F)	UTC	223,100	No	$58,700,000,000	N.A.	N.A.

Notes:

(A) http://www.finmeccanica.com
(B) http://www.Textron.com/about/company
(C) http://www.eads.com
(F) http://www.utc.com/about—utc/fast—facts.lhtml

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Part 27 and Part 29 Helicopter Operators

Size Standards

While there are only seven part 27 and four part 29 helicopter manufacturers in the United States, there are many small entities that are operators of part 27 and part 29 helicopters. Each of these operators may provide many services or only one. Such services include offshore transportation, executive transportation, fire-fighting, Emergency Medical Services (EMS), and training in maintenance, repair, and modification.

The SBA lists small entity size standards for air transportation under Sector 44–45, Retail Trade, Subsector 481, Air Transportation. The small entity size standards are 1,500 employees for scheduled and nonscheduled charter passenger and freight transportation. This standard is $28.0 million annually if the passenger or freight air transportation is offshore marine air transportation. Finally, the small entity size standard for other—non-scheduled air transportation is $7.0 million annually.

This proposed rule is not expected to increase the costs of part 27 or part 29 helicopter operators, because we believe the helicopter inspection time for a composite part will be the same as or less than for a metallic part inspection. We request comments regarding this assumption.

Consequently, the FAA certifies that this proposed rule would not have a significant economic impact on a substantial number of part 27 or part 29 rotorcraft manufacturers or operators.

International Trade Impact Assessment

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 standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, establishing standards is not considered an unnecessary obstacle to the foreign commerce of the United States, so long as the standard has a legitimate domestic objective, such as the protection of safety, and does 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 has assessed the potential effect of this proposed rule and determined that it would impose the same costs on domestic and international entities and thus has a neutral trade impact.

Unfunded Mandates Assessment

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) in any 1 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 threshold value of $141.3 million. This proposed rule does not contain such a mandate.

Executive Order 13132, Federalism

The FAA has analyzed this proposed 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, on the relationship between the national government and the states, or on the distribution of power and responsibilities among the various levels of government, and therefore, would not have federalism implications.

Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the Administrator, when modifying regulations in Title 14 of the CFR 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. Because this proposed rule would apply to the certification of future designs of rotorcraft and their subsequent operation, it could, if adopted, affect intrastate aviation in Alaska. The FAA, therefore, specifically requests comments on whether there is justification for applying the proposed rule differently in intrastate operations in Alaska.

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 proposed rulemaking action qualifies for the categorical exclusion identified in paragraph 312f and involves no extraordinary circumstances.

Regulations That Significantly Affect Energy Supply, Distribution, or Use

The FAA has analyzed this NPRM 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 regulatory action'' under the executive order because it is not likely to have a significant adverse effect on the supply, distribution, or use of energy.

Additional Information

Comments Invited:

The FAA invites interested persons to participate in this rulemaking by submitting written comments, data, or views. We also invite comments relating to the economic, environmental, energy, or federalism impacts that might result from adopting the proposals in this document. The most helpful comments reference a specific portion of the proposal, explain the reason for any recommended change, and include supporting data. To ensure the docket does not contain duplicate comments, please send only one copy of written comments, or if you are filing comments electronically, please submit your comments only one time.

We will file in the docket all comments we receive, as well as a report summarizing each substantive public contact with FAA personnel concerning this proposed rulemaking. Before acting on this proposal, we will consider all comments we receive on or before the closing date for comments. We will consider comments filed after the comment period has closed if it is possible to do so without incurring expense or delay. We may change this proposal in light of the comments we receive.

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, notice number, or amendment number of this rulemaking.

You may access all documents the FAA considered in developing this proposed rule, including economic analyses and technical reports, from the internet through the Federal eRulemaking Portal referenced in paragraph 1.

List of Subjects

14 CFR Part 27

Aircraft, Aviation safety.

14 CFR Part 29

Aircraft, Aviation safety.

The Proposed Amendment

In consideration of the foregoing, the Federal Aviation Administration proposes to amend parts 27 and 29 of Title 14, Code of Federal Regulations, as follows:

PART 27—AIRWORTHINESS STANDARDS: NORMAL CATEGORY ROTORCRAFT

1. The authority citation for part 27 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

2. Add a new § 27.573 to read as follows:

§ 27.573 Damage Tolerance and Fatigue Evaluation of Composite Rotorcraft Structures.

(a) Each applicant must evaluate the composite rotorcraft structure under the damage tolerance standards of paragraph (d) of this section unless the applicant establishes that a damage tolerance evaluation is impractical within the limits of geometry, inspectability, and good design practice. If an applicant establishes that it is impractical within the limits of geometry, inspectability, and good design practice, the applicant must do a fatigue evaluation in accordance with paragraph (e) of this section.

(b) The compliance methodology of each applicant, and the results of that methodology, requires FAA approval.

(c) Definitions:

(1) *Catastrophic failure* is an event that could prevent continued safe flight and landing.

(2) *Principal Structural Elements (PSEs)* are structural elements that contribute significantly to the carrying of flight or ground loads, the failure of which could result in catastrophic failure of the rotorcraft.

(3) *Threat Assessment* is an assessment that specifies the locations, types, and sizes of damage, considering fatigue, environmental effects, intrinsic and discrete flaws, and impact or other accidental damage (including the discrete source of the accidental damage) that may occur during manufacture or operation.

(d) Damage Tolerance Evaluation:

(1) Each applicant must show that catastrophic failure due to static and fatigue loads, considering the intrinsic or discrete manufacturing defects or accidental damage, is avoided throughout the operational life or prescribed inspection intervals of the rotorcraft by performing damage tolerance evaluations of the strength of composite PSEs and other parts, detail design points, and fabrication techniques. Each applicant must account for the effects of material and process variability along with environmental conditions in the strength and fatigue evaluations. Each applicant must evaluate parts that include PSEs of the airframe, main and tail rotor drive systems, main and tail rotor blades and hubs, rotor controls, fixed and movable control surfaces, engine and transmission mountings, landing gear and other parts, detail design points, and fabrication techniques deemed critical by the FAA. Each damage tolerance evaluation must include:

(i) The identification of all PSEs;

(ii) In-flight and ground measurements for determining the loads or stresses for all PSEs for all critical conditions throughout the range of limits in § 27.309 (including altitude effects), except that maneuvering load factors need not exceed the maximum values expected in service;

(iii) The loading spectra as severe as those expected in service based on loads or stresses determined under paragraph (d)(1)(ii) of this section, including external load operations, if applicable, and other operations including high-torque events;

(iv) A threat assessment for all PSEs that specifies the locations, types, and sizes of damage, considering fatigue, environmental effects, intrinsic and discrete flaws, and impact or other accidental damage (including the discrete source of the accidental damage) that may occur during manufacture or operation; and

(v) An assessment of the residual strength and fatigue characteristics of all PSEs that supports the replacement times and inspection intervals established under paragraph (d)(2) of this section.

(2) Each applicant must establish replacement times, inspections, or other procedures for all PSEs to require the repair or replacement of damaged parts before a catastrophic failure. These replacement times, inspections, or other procedures must be included in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by § 27.1529.

(i) Replacement times for PSEs must be determined by tests, or by analysis supported by tests, and must show that

the structure is able to withstand the repeated loads of variable magnitude expected in-service. In establishing these replacement times, the following items must be considered:

(A) Damage identified in the threat assessment required by paragraph (d)(1)(iv) of this section;

(B) Maximum acceptable manufacturing defects and in-service damage *(i.e.,* those that do not lower the residual strength below ultimate design loads and those that can be repaired to restore ultimate strength); and

(C) Ultimate load strength capability after applying repeated loads.

(ii) Inspection intervals for PSEs must be established to reveal any damage identified in the threat assessment required by paragraph (d)(1)(iv) of this section that may occur from fatigue or other in-service causes before such damage has grown to the extent that the component cannot sustain the required residual strength capability. In establishing these inspection intervals, the following items must be considered:

(A) The growth rate, including no-growth, of the damage under the repeated loads expected in-service determined by tests or analysis supported by tests;

(B) The required residual strength for the assumed damage established after considering the damage type, inspection interval, detectability of damage, and the techniques adopted for damage detection. The minimum required residual strength is limit load; and

(C) Whether the inspection will detect the damage growth before the minimum residual strength is reached and restored to ultimate load capability, or whether the component will require replacement.

(3) Each applicant must consider the effects of damage on stiffness, dynamic behavior, loads, and functional performance on all PSEs in establishing the allowable damage size and inspection interval.

(e) Fatigue Evaluation: If an applicant establishes that the damage tolerance evaluation described in paragraph (d) of this section is impractical within the limits of geometry, inspectability, or good design practice, the applicant must do a fatigue evaluation of the particular composite rotorcraft structure and:

(1) Identify all PSEs considered in the fatigue evaluation;

(2) Identify the types of damage for all PSEs considered in the fatigue evaluation;

(3) Establish supplemental procedures to minimize the risk of catastrophic failure associated with the damages identified in paragraph (e) of this section; and

(4) Include these supplemental procedures in the Airworthiness Limitations section of the Instructions for Continued Airworthiness required by § 27.1529.

Appendix A to Part 27 [Amended]

3. Amend the second sentence of section A.27.4 of Appendix A to Part 27 by removing the phrase ''approved under § 27.571'' and adding the phrase ''required for type certification'' in its place.

PART 29—AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY ROTORCRAFT

4. The authority citation for part 29 continues to read as follows:

Authority: 49 U.S.C. 106(g), 40113, 44701–44702, 44704.

5. Add a new § 29.573 to read as follows:

§ 29.573 Damage Tolerance and Fatigue Evaluation of Composite Rotorcraft Structures.

(a) Each applicant must evaluate the composite rotorcraft structure under the damage tolerance standards of paragraphs (d) of this section unless the applicant establishes that a damage tolerance evaluation is impractical within the limits of geometry, inspectability, and good design practice. If an applicant establishes that it is impractical within the limits of geometry, inspectability, and good design practice, the applicant must do a fatigue evaluation in accordance with paragraph (e) of this section.

(b) The compliance methodology of each applicant, and the results of that methodology, requires approval by the FAA.

(c) Definitions:

(1) *Catastrophic failure* is an event that could prevent continued safe flight and landing.

(2) *Principal Structural Elements (PSEs)* are structural elements that contribute significantly to the carrying of flight or ground loads, the failure of which could result in catastrophic failure of the rotorcraft.

(3) *Threat Assessment* is an assessment that specifies the locations, types, and sizes of damage, considering fatigue, environmental effects, intrinsic and discrete flaws, and impact or other accidental damage (including the discrete source of the accidental damage) that may occur during manufacture or operation.

(d) Damage Tolerance Evaluation:

(1) Each applicant must show that catastrophic failure due to static and fatigue loads, considering the intrinsic or discrete manufacturing defects or accidental damage, is avoided throughout the operational life or prescribed inspection intervals of the rotorcraft by performing damage tolerance evaluations of the strength of composite PSEs and other parts, detail design points, and fabrication techniques. Each applicant must account for the effects of material and process variability along with environmental conditions in the strength and fatigue evaluations. Each applicant must evaluate parts that include PSEs of the airframe, main and tail rotor drive systems, main and tail rotor blades and hubs, rotor controls, fixed and movable control surfaces, engine and transmission mountings, landing gear and other parts, detail design points, and fabrication techniques deemed critical by the FAA. Each damage tolerance evaluation must include:

(i) The identification of all PSEs;

(ii) In-flight and ground measurements for determining the loads or stresses for all PSEs for all critical conditions throughout the range of limits in § 29.309 (including altitude effects), except that maneuvering load factors need not exceed the maximum values expected in service;

(iii) The loading spectra as severe as those expected in service based on loads or stresses determined under paragraph (d)(1)(ii) of this section, including external load operations, if applicable, and other operations including high-torque events;

(iv) A threat assessment for all PSEs that specifies the locations, types, and sizes of damage, considering fatigue, environmental effects, intrinsic and discrete flaws, and impact or other accidental damage (including the discrete source of the accidental damage) that may occur during manufacture or operation; and

(v) An assessment of the residual strength and fatigue characteristics of all PSEs that supports the replacement times and inspection intervals established under paragraph (d)(2) of this section.

(2) Each applicant must establish replacement times, inspections, or other procedures for all PSEs to require the repair or replacement of damaged parts before a catastrophic failure. These replacement times, inspections, or other procedures must be included in the Airworthiness Limitations Section of the Instructions for Continued Airworthiness required by § 29.1529.

(i) Replacement times for PSEs must be determined by tests, or by analysis supported by tests, and must show that the structure is able to withstand the repeated loads of variable magnitude expected in-service. In establishing

these replacement times, the following items must be considered:

(A) Damage identified in the threat assessment required by paragraph (d)(1)(iv) of this section;

(B) Maximum acceptable manufacturing defects and in-service damage (i.e., those that do not lower the residual strength below ultimate design loads and those that can be repaired to restore ultimate strength); and

(C) Ultimate load strength capability after applying repeated loads.

(ii) Inspection intervals for PSEs must be established to reveal any damage identified in the threat assessment required by paragraph (d)(1)(iv) of this section that may occur from fatigue or other in-service causes before such damage has grown to the extent that the component cannot sustain the required residual strength capability. In establishing these inspection intervals, the following items must be considered:

(A) The growth rate, including no-growth, of the damage under the repeated loads expected in-service determined by tests or analysis supported by tests;

(B) The required residual strength for the assumed damage established after considering the damage type, inspection interval, detectability of damage, and the techniques adopted for damage detection. The minimum required residual strength is limit load; and

(C) Whether the inspection will detect the damage growth before the minimum residual strength is reached and restored to ultimate load capability, or whether the component will require replacement.

(3) Each applicant must consider the effects of damage on stiffness, dynamic behavior, loads, and functional performance on all PSEs in establishing the allowable damage size and inspection interval.

(e) Fatigue Evaluation: If an applicant establishes that the damage tolerance evaluation described in paragraph (d) of this section is impractical within the limits of geometry, inspectability, or good design practice, the applicant must do a fatigue evaluation of the particular composite rotorcraft structure and:

(1) Identify all PSEs considered in the fatigue evaluation;

(2) Identify the types of damage for all PSEs considered in the fatigue evaluation;

(3) Establish supplemental procedures to minimize the risk of catastrophic failure associated with the damages identified in paragraph (e) of this section; and

(4) Include these supplemental procedures in the Airworthiness Limitations section of the Instructions for Continued Airworthiness required by § 29.1529.

Appendix A to Part 29 [Amended]

6. Amend the second sentence of section A.29.4 of Appendix A to Part 29 by removing the phrase ''approved under § 29.571'' and adding the phrase ''required for type certification'' in its place.

Issued in Washington, DC, on December 18, 2009.

K.C. Yanamura,

Acting Director, Aircraft Certification Service.

[FR Doc. E9–31381 Filed 1–5–10; 8:45 am]

BILLING CODE 4910–13–P

DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 39

[Docket No. FAA–2009–0674; Directorate Identifier 2009–NE–25–AD]

RIN 2120–AA64

Airworthiness Directives; Rolls-Royce plc RB211–Trent 500, 700, and 800 Series Turbofan Engines

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Notice of proposed rulemaking (NPRM).

SUMMARY: The FAA proposes to supersede an existing airworthiness directive (AD) for Rolls-Royce plc RB211–Trent 800 series turbofan engines. That AD currently requires replacing the fuel-to-oil heat exchanger (FOHE). This proposed AD would require replacing the FOHE on the RB211–Trent 500 and RB211–Trent 700 series turbofan engines in addition to the RB211–Trent 800 series turbofan engines. This proposed AD results from mandatory continuing airworthiness information (MCAI) issued by an aviation authority of another country to identify and correct an unsafe condition on an aviation product, and results from the risk of engine FOHE blockage. The MCAI describes the unsafe condition as:

In January 2008, a Boeing 777 powered by RB211–Trent 800 engines crashed short of the runway as a result of dual loss of engine response during the final stages of approach. The investigation of the incident has established that, under certain ambient conditions, ice can accumulate on the walls of the fuel pipes within the aircraft fuel system, which can then be released downstream when fuel flow demand is increased. This released ice can then collect on the FOHE front face and limit fuel flow through the FOHE. This type of icing event was previously unknown and creates ice concentrations into the fuel system beyond those specified in the certification requirements.

In May 2009, an Engine Indicating and Crew Alerting System (EICAS) surge message was set following a successful go-around maneuver on a single RB211–Trent 700 engine of an A330 aircraft. Subsequent analysis concluded the likely cause to be temporary ice accumulation causing fuel flow restriction in the FOHE. The incident has indicated the potential susceptibility to ice blockage for Airbus aircraft in combination with Rolls-Royce engines that feature similar fuel systems to the RB211–Trent 800.

We are proposing this AD to prevent ice from blocking the FOHE, which could result in an unacceptable engine power loss and loss of control of the airplane.

DATES: We must receive comments on this proposed AD by February 5, 2010.

ADDRESSES: You may send comments by any of the following methods:

- *Federal eRulemaking Portal:* Go to *http://www.regulations.gov* and follow the instructions for sending your comments electronically.
- *Mail:* Docket Management Facility, U.S. Department of Transportation, 1200 New Jersey Avenue, SE., West Building Ground Floor, Room W12–140, Washington, DC 20590–0001.
- *Hand Delivery:* Deliver to Mail address above between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays.
- *Fax:* (202) 493–2251.

Contact Rolls-Royce plc, P.O. Box 31, DERBY, DE24 8BJ, UK; telephone 44 (0) 1332 242424; fax 44 (0) 1332 249936, for the service information identified in this proposed AD.

Examining the AD Docket

You may examine the AD docket on the Internet at *http://www.regulations.gov;* or in person at the Docket Operations office between 9 a.m. and 5 p.m., Monday through Friday, except Federal holidays. The AD docket contains this proposed AD, the regulatory evaluation, any comments received, and other information. The street address for the Docket Operations office (telephone (800) 647–5527) is the same as the Mail address provided in the **ADDRESSES** section. Comments will be available in the AD docket shortly after receipt.

FOR FURTHER INFORMATION CONTACT: James Lawrence, Aerospace Engineer, Engine Certification Office, FAA, Engine and Propeller Directorate, 12 New England Executive Park, Burlington, MA 01803; e-mail: *james.lawrence@faa.gov;* telephone (781) 238–7176; fax (781) 238–7199.

SUPPLEMENTARY INFORMATION: