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DEPARTMENT OF TRANSPORTATION

Federal Aviation Administration

14 CFR Part 29

[Docket No. FAA-2016-6940; Notice No. 29-039-SW-SC]

Special Conditions: Bell Helicopter Textron, Inc. (BHTI), Model 525 Helicopters; Crew Alerting System (CAS)

AGENCY: Federal Aviation Administration (FAA), DOT.

ACTION: Final special conditions.

SUMMARY: These special conditions are issued for the BHTI Model 525 helicopter. This helicopter will have a novel or unusual design feature associated with the electronic CAS. The applicable airworthiness regulations do not contain adequate or appropriate safety standards for this design feature. These special conditions contain the additional safety standards that the Administrator considers necessary to establish a level of safety equivalent to that established by the existing airworthiness standards.

DATES: These special conditions are effective [INSERT DATE 30 DAYS AFTER DATE OF PUBLICATION IN THE FEDERAL REGISTER].

FOR FURTHER INFORMATION CONTACT: Martin R. Crane, Aviation Safety Engineer, Safety Management Group, Rotorcraft Directorate, FAA, 10101 Hillwood Pkwy, Fort Worth, TX 76177; telephone (817) 222-5110; email martin.r.crane@faa.gov.

SUPPLEMENTARY INFORMATION:

Background

On December 15, 2011, BHTI applied for a type certificate for a new transport category helicopter designated as the Model 525. The aircraft is a medium twin-engine rotorcraft. The design maximum takeoff weight is 20,000 pounds, with a maximum capacity of 16 passengers and a crew of 2.

BHTI proposes that the Model 525 use a novel and unusual design feature, which is an electronic CAS. Section 29.1322 of Title 14, Code of Federal Regulations (14 CFR), prescribes discrete colored lights for warning, caution, and advisory alerts. In this regard, § 29.1322 lacks adequate airworthiness standards for alerting messages and displays that do not use discrete colored lights, that include non-visual cues, that provide alerting information to the flightcrew, and that use integrated and multiple alerts concurrently.

The Model 525 CAS will have more effective integrated visual, aural, tactile, and alert messaging that will require special airworthiness standards, known as special conditions, to address crew alerting of failures or malfunctions in critical systems. These special conditions will add requirements from the airworthiness standards in § 25.1322 (Amendment 25-131) for advanced crew alerting systems in transport category aircraft.

Type Certification Basis

Under the provisions of 14 CFR 21.17, BHTI must show that the Model 525 meets the applicable provisions of part 29, as amended by Amendments 29-1 through 29-55 thereto. The BHTI Model 525 certification basis date is December 15, 2011, the date of application to the FAA.

If the Administrator finds that the applicable airworthiness regulations (i.e., 14 CFR part 29) do not contain adequate or appropriate safety standards for the BHTI Model 525 because of a novel or unusual design feature, special conditions are prescribed under the provisions of § 21.16.

Special conditions are initially applicable to the model for which they are issued. Should the type certificate for that model be amended later to include any other model that incorporates the same or similar novel or unusual design feature, the special conditions would also apply to the other model under § 21.101.

The FAA issues special conditions, as defined in 14 CFR 11.19, in accordance with § 11.38, and they become part of the type-certification basis under § 21.17(a)(2).

Novel or Unusual Design Features

The BHTI Model 525 helicopter will incorporate the following novel or unusual design features: an advanced CAS system. The novel design includes the integration of audio and visual alerts, tactical sensors, and CAS message consolidation. The new technologies associated with integrated visual, aural, tactile, and alert messaging are more effective in alerting the flightcrew and aiding them in decision-making than the discrete colored lights for warning, caution, and advisory alerts prescribed in § 29.1322 alone.

Discussion

The current 14 CFR part 29 standards do not provide adequate standards for the advanced CAS system of the Bell Model 525 helicopter due to the complexity of the aircraft systems and the modes of the fly-by-wire primary flight controls. The special condition will update definitions, define a prioritization scheme, expand color requirements, and address performance for flightcrew alerting to reflect changes in technology and functionality.

Comments

A notice of proposed special conditions for the BHTI Model 525 helicopter CAS was published in the Federal Register on June 3, 2016 (81 FR 35654). We did not receive any comments.

Applicability

As discussed above, these special conditions are applicable to the BHTI Model 525 helicopter. Should BHTI apply at a later date for a change to the type certificate to include another model incorporating the same novel or unusual design feature, the special conditions would apply to that model as well.

Conclusion

This action affects only certain novel or unusual design features on one model of helicopter. It is not a rule of general applicability.

List of Subjects in 14 CFR Part 29

Aircraft, Aviation safety, Reporting and recordkeeping requirements.

The authority citation for these special conditions is as follows:

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

The Special Conditions

Accordingly, the Federal Aviation Administration (FAA) issues the following special conditions as part of the type certification basis for Bell Helicopter Textron, Inc., Model 525 helicopters.

Flightcrew Alerting

(a) Flightcrew alerts must:

(1) Provide the flightcrew with the information needed to:

(i) Identify non-normal operation or aircraft system conditions, and

(ii) Determine the appropriate actions, if any.

(2) Be readily and easily detectable and intelligible by the flightcrew under all foreseeable operating conditions, including conditions where multiple alerts are provided.

(3) Be removed when the alerting condition no longer exists.

(b) Alerts must conform to the following prioritization hierarchy based on the urgency of flightcrew awareness and response.

(1) Warning: For conditions that require immediate flightcrew awareness and immediate flightcrew response.

(2) Caution: For conditions that require immediate flightcrew awareness and subsequent flightcrew response.

(3) Advisory: For conditions that require flightcrew awareness and may require subsequent flightcrew response.

(c) Warning and caution alerts must:

(1) Be prioritized within each category, when necessary.

(2) Provide timely attention-getting cues through at least two different senses by a combination of aural, visual, or tactile indications.

(3) Permit each occurrence of the attention-getting cues required by paragraph (c)(2) of these special conditions to be acknowledged and suppressed, unless they are required to be continuous.

(d) The alert function must be designed to minimize the effects of false and nuisance alerts. In particular, it must be designed to:

(1) Prevent the presentation of an alert that is inappropriate or unnecessary.

(2) Provide a means to suppress an attention-getting component of an alert caused by a failure of the alerting function that interferes with the flightcrew's ability to safely operate the helicopter. This means must not be readily available to the flightcrew so that it could be operated inadvertently or by habitual reflexive action. When an alert is suppressed, there must be a clear and unmistakable annunciation to the flightcrew that the alert has been suppressed.

(e) Visual alert indications must:

(1) Conform to the following color convention:

(i) Red for warning alert indications.

(ii) Amber or yellow for caution alert indications.

(iii) Any color except red, amber, yellow, or green for advisory alert indications.

(2) Use visual coding techniques, together with other alerting function elements in the cockpit, to distinguish between warning, caution, and advisory alert indications, if they are presented on monochromatic displays that are not capable of conforming to the color convention in paragraph (e)(1) of these special conditions.

(f) Use of the colors red, amber, and yellow in the cockpit for functions other than flightcrew alerting must be limited and must not adversely affect flightcrew alerting.

Issued in Fort Worth, Texas, on November 3, 2016.

Lance Gant

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Aircraft Certification Service

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