

DISPOSITION OF PUBLIC COMMENTS

DRAFT AC 25.851-X, *Built-in Fire Extinguisher/Fire Suppression Systems in Class C and F Cargo Compartments*

Prepared by Steve Happenny, ANM-112

No.	Comment	Requested Change	Disposition
Commenter: Roger Aubert, Bell Helicopter Textron Inc.			
1	In 5. Definition: I would recommend to expand on the sentence “Systems that are located in remote (e.g., inaccessible) areas are not required to extinguish a fire in its entirety”. It should be described that fire defense is normally a two-step process: 1) Eliminate the source of the fire by isolating flammable fluids, electrical power, air supply, and 2) extinguish the fire. In the case of inaccessible cargo compartment, it is not always possible to eliminate the source of fire.		<p>The Federal Aviation Administration (FAA) disagrees. The FAA acknowledges that engine and auxiliary power unit (APU) fire protection do follow a process that involves isolating flammable materials. An example of this is via the use of a fuel shutoff valve that prevents fuel from continuing to flow following initiation of the engine firefighting process. However, as the commenter states, it is not possible to eliminate the source of a fire in a cargo compartment. As this advisory circular (AC) provides guidance on cargo compartments and does not directly include guidance on engine and APU fire extinguishing systems, the FAA does not agree with including additional material of this nature.</p> <p>The definition of the applicable systems is now a note at the end of the Purpose paragraph.</p>
2	In 8.1: It should be made clear that “reminder [<i>sic</i>] of the flight” includes full stop on runway.		<p>The FAA disagrees. The first sentence in this paragraph states that the requirement is <i>for the time duration required to land and evacuate the airplane</i>. Airplane evacuation is only initiated upon a full stop on the runway or taxiway as the pilot believes appropriate. The FAA believes that the additional language would not provide any further</p>

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			clarification.
3	In 8.1: What is the definition of initial 5 percent concentration; define duration?		<p>No change requested. The 5% by volume concentration value used in paragraph 8.1 is applicable for the use of Halon 1301 as the fire suppression agent. Historical test data has validated that this value of agent is required to knock down a fire (i.e., remove flames). The term <i>duration</i> refers to the total time that the fire suppression system must meet its intended function over the operation of the airplane beginning with the initial cargo compartment indication of a fire through the airplane evacuation on the ground. As stated in the AC in paragraph 8.1:</p> <p><i>The applicant should demonstrate that the cargo fire extinguishing system provides adequate concentration levels of extinguishing agent to combat a fire anywhere baggage and cargo is placed within the cargo compartment for the time duration required to land and evacuate the airplane.</i></p>
4	8.3 is strikethrough.		Agree. Strikethrough removed.

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1	<p>Page 3 Paragraph 6.1 (Background)</p> <p>The proposed text states:</p> <p><i>“6.1. Paragraphs (c) and (f) of § 25.857 provide standards for certification of two classes of cargo compartments, Class C and Class F. A Class C cargo compartment is configured in a manner that incorporates a built-in fire extinguisher/fire suppression system to extinguish or control any fire likely to occur in the cargo compartment. Therefore, the means to extinguish a fire applies to bulk-loaded cargo, cargo loaded on pallets, and cargo within unit load devices. A Class F cargo compartment must be accessible in flight. Both Class C and Class F cargo compartments have fire or smoke detection systems to alert the crew to the presence of the fire anywhere within the cargo compartment (i.e., anywhere cargo is designed to be carried).”</i></p>	<p>We recommend revising the text as follows:</p> <p><i>“6.1. Paragraphs (c) and (f) of § 25.857 provide standards for certification of two classes of cargo compartments, Class C and Class F. A Class C cargo compartment is configured in a manner that incorporates a built-in fire extinguisher/fire suppression system to extinguish or suppress control any fire likely to occur in the cargo compartment. Therefore, the means to extinguish or suppress a fire applies to bulk-loaded cargo, cargo loaded on pallets, and cargo within unit load devices. A Class F cargo compartment must be accessible in flight. Both Class C and Class F cargo compartments have fire or smoke detection systems to alert the crew to the presence of the fire anywhere within the cargo compartment (i.e., anywhere cargo is designed to be carried).”</i></p> <p>The proposed change would provide</p>	<p>The FAA concurs with the comments submitted. While the proposed language agrees with the current European Aviation Safety Agency (EASA) Acceptable Means of Compliance (AMC) on this subject, the FAA agrees that the word <i>suppress</i> should replace the word <i>control</i> in the sentences indicated in paragraph 6.1.</p>

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		consistent wording with the definitions provided in Paragraph 5 of this proposed Advisory Circular.	
2	<p>Page 5-6</p> <p>Paragraph 7.6 (Compartment Classification)</p> <p>The proposed text states:</p> <p><i>“7.6. A Class F compartment (see §25.857(f)) is one that has a means to control or extinguish a fire without requiring a crewmember to enter the compartment. Class F compartments that include a built-in fire extinguisher/suppression system or require the use of other means acceptable to the FAA would meet these requirements. The Class F compartment must have a fire or smoke detection system installed in accordance with §25.857(f)(1). Unless there are other means of containing the fire and protecting critical systems and structure, a Class F compartment must have a liner meeting the requirements of part III of appendix F to part 25, or other</i></p>	<p>We recommend revising the text as follows:</p> <p><i>“7.6. A Class F compartment (see § 25.857(f)) is one that has a means to control or extinguish a fire without requiring a crewmember to enter the compartment. Class F compartments that include a built-in fire extinguisher/suppression system or require the use of other means acceptable to the FAA would meet these requirements. The Class F compartment must have a fire or smoke detection system installed in accordance with §25.857(f)(1). Unless there are other means of containing the fire and protecting critical systems and structure, a Class F compartment must have a liner meeting the requirements of part III of appendix F to part 25, or other approved equivalent methods (see §25.855(b)). There must also be means</i></p>	<p>The FAA partially agrees. We agree that moving the sentence, <i>There must also be a means to exclude hazardous quantities of extinguishant and products of combustion from occupied areas (see §25.857(f)(3))</i>, up with the other requirements in the paragraph is more clear.</p> <p>We disagree with the commenter’s citation of examples of possible uses of Class F cargo compartments on the upper deck or lower lobe, and we reiterate that, as the proposed rule text in the NPRM reads <i>...A Class F cargo or baggage compartment is located on the main deck...—....</i> The position of the FAA is that this restriction is an inherent part of Class F cargo compartments regardless of the intended operation. Extending the use of Class F cargo compartments to remote areas such as upper deck or lower lobe for certain operations (e.g., all cargo/freighter operations) is beyond the scope of this advisory circular.</p> <p>We have also revised the description of a Class F compartment, which is now in paragraph 6.6 and</p>

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	<p><i>approved equivalent methods (see §25.855(b)). The Class F cargo compartment was introduced as a practicable and safe alternative to the previous practice of providing large Class B cargo compartments. Class B and Class F cargo compartments are limited to the main deck for accessibility reasons. Lower deck cargo compartments should not be approved as Class F cargo compartments. All lower deck or remote cargo compartments in airplanes carrying passengers need to comply with the Class C cargo compartment requirements of §25.857(c). There must also be means to exclude hazardous quantities of extinguishant and products of combustion from occupied areas (see §25.857(f)(3)).”</i></p>	<p><i>to exclude hazardous quantities of extinguishant and products of combustion from occupied areas (see §25.857(f)(3)). The Class F cargo compartment was introduced as a practicable and safe alternative to the previous practice of providing large Class B cargo compartments. Class B and Class F cargo compartments are were limited to the main deck allow sufficient access in flight to enable a crewmember to effectively reach any part of the compartment with the contents of a hand fire extinguisher for accessibility reasons. Lower deck cargo compartments should not be approved as Class F cargo compartments. All lower deck or remote cargo compartments in airplanes carrying passengers need to comply with the Class C cargo compartment requirements of §25.857(c), and therefore lower deck cargo compartments on passenger aircraft should not be approved as Class F cargo compartments. There must also be means to exclude</i></p>	<p>subparagraphs 6.6.1, and 6.6.2.</p>

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		<p><i>hazardous quantities of extinguishant and products of combustion from occupied areas (see § 25.857(f)(3)).</i></p> <p>Moving the text related to “<i>hazardous quantifies of smoke</i>” clarifies that it is applicable to the Class F definition; whereas, the previous location of the text makes its application ambiguous.</p> <p>By limiting Class F cargo compartments to compartments “<i>located on the main deck,</i>” applicants would be unable to certify a compartment located on the upper deck of an airplane as a Class F cargo compartment. By limiting the Class F compartment to “<i>a readily accessible compartment,</i>” the applicant would be unable to certify a compartment located on the lower deck of a freighter aircraft in lieu of the allowed Class E compartment.</p>	
3	Page 13 Paragraph 11.2 (Evaluation of Alternate Liquid Agent and Fire	We recommend revising the text as follows: “ <i>11.2. If the proposed design will use a</i>	We agree with the suggested changes. We changed “a certification review item” to “an issue paper” and all instances of <i>alternate</i> to <i>alternative</i> where

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	<p>Extinguishing/Suppression Systems)</p> <p>The proposed text states:</p> <p><i>“11.2. If the proposed design will use a liquid fire extinguishing agent or system, or any non-halon agent, the FAA should be contacted. The FAA may initiate a certification review item addressing the use of an alternate fire extinguishing agent or system.”</i></p>	<p><i>liquid fire extinguishing agent or system, or any non-halon agent, the FAA should be contacted. The FAA may initiate a certification review item an issue paper addressing the use of an alternate alternative fire extinguishing agent or system.”</i></p> <p>The term “<i>certification review item</i>” is EASA terminology. The FAA equivalent is an “<i>issue paper</i>.”</p>	<p>we had used it as an adjective.</p>