

<b>DISPOSITION OF PUBLIC COMMENTS</b>			
<b>AC 25.1357-1X, CIRCUIT PROTECTIVE DEVICES</b>			
<b>Commenter</b>	<b>Comment</b>	<b>Requested Change</b>	<b>Disposition</b>
<p><a href="#">18379-64</a> AIA/GAMA</p>	<p>AC 25.1357-1X Circuit Protective Devices, Page 3, Paragraph 3.a., says that arc fault breakers “should be considered for use as they come available. . .” There is no objection to the idea, but it is not clear how this is supposed to be interpreted. Does an applicant have to justify to the authority that arc fault breakers are not appropriate? Because “consideration” is not a means of compliance to 1357, this part should be deleted.</p>	<p>The commenter suggested deleting the following text:</p> <p><b>3. COMPLIANCE GUIDANCE.</b></p> <p><b>a. Arc Fault Circuit Breakers.</b> <del>Are fault circuit breakers should be considered for use as they become available for the various types of circuits found in airplanes (28 VDC or 3 phase 115 VAC, for example).</del></p>	<p>The FAA concurs with the comment. The revised text reads as follows:</p> <p><b>a. Protection Against Arc Faults Circuit Breakers.</b> Protection against faults should be provided. <del>Arc fault circuit breakers should be considered for use as they become available for the various types of circuits found in airplanes (28 VDC or 3 phase 115 VAC, for example).</del></p>
<p><a href="#">18379-64</a> AIA/GAMA</p>	<p>Page 3, Paragraph 3.c. There should be some definition of what “accessible” means for a CPD (reach from pilot seat, on the flight deck but not accessible from seat, etc.).</p>	<p>The commenter requested that the FAA define “accessible” as used in the following section.</p> <p><b>c. § 25.1357(d).</b> This section requires that a CPD must be <b>accessible</b> if the ability to reset or replace it is essential to safety in flight. It must be ensured that single failures and combinations of failures, including automatic CPD disconnections, are considered in defining a safe design. Any single CPD through which continued electrical power is conducted, including those used to protect buses or power sources, that is essential to safety in flight must be <b>accessible</b> to the flightcrew.</p>	<p>The FAA concurs with the commenter’s suggestion, and has made the following change:</p> <p>. Any single CPD through which continued electrical power is conducted, including those used to protect buses or power sources, that is essential to safety in flight must be accessible to the flightcrew, <b>without having to leave their seat.</b></p>

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<a href="#">18379-64</a> AIA/GAMA	Page 4, Paragraph 3.d.(4). This paragraph requires fault clearing and isolation procedures to be approved by the cognizant ACO. There is no justification to require these specific procedures to always be approved by the ACO. If a delegated organization (or designee) is otherwise qualified to review and approve the procedures, it should be allowed to do so. To fence off certain procedures to require ACO approval is counter to all of FAA’s other delegation initiatives.	The commenter requested that the FAA delete the approval requirement and change the paragraph to read:  <b><u>Fault-clearing and isolation procedures.</u></b> The airplane flight manual (AFM) or applicable AFM supplement should contain all fault-clearing and isolation procedures. <b>These procedures should be approved by the cognizant Aircraft Certification Office.</b>  To -  <b>(4) <u>Fault-clearing and isolation procedures.</u></b> The airplane flight manual (AFM) or applicable AFM supplement should contain all fault-clearing and isolation procedures. <b>These procedures should be approved by the cognizant Aircraft Certification Office.</b>	The FAA finds that even with a delegation in place, the ultimate approval responsibility resides with FAA. Therefore no change is made to the text.
AIA/GAMA Comment no. <a href="#">18379-64</a>	Add to page 4, paragraph f(1): “On the contrary, it is acceptable to have procedures that call for use of the circuit breaker(s) to interrupt power to systems in abnormal situations where it is advisable, e.g. to recover system function. The applicant should show that the anticipated usage will not exceed the number of reset cycles for which the circuit	The commenter requested that the FAA change the following text that now states:  It is not the intent of the requirement that every electrically powered system in the airplane have a means to remove power other than a circuit breaker. We distinguish between airplane systems normally turned on and off during normal operations, such as	The FAA believes that unique abnormal cases requiring power removal via circuit breakers can be presented to FAA as part of the design considering all aspects of failure conditions and the method to isolate the fault. Therefore, no change will be made.

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	<p>breaker is qualified.” This will clarify that it is permissible to use CB cycling in unusual/abnormal situations and what technical considerations are necessary to allow such use.</p>	<p>passenger convenience systems, and those systems normally powered at all times, such as flight deck multi-function displays or the flight-management computer. But if, for example, the flight-management computer did require power cycling regularly, for whatever reason, this system would be required to have a means to do this other than using the circuit breakers, unless the circuit breaker is specifically designed as a switch.</p> <p>To read as follows:</p> <p>(1) It is not the intent of the requirement that every electrically powered system in the airplane have a means to remove power other than a circuit breaker. <b>On the contrary, it is acceptable to have procedures that call for use of the circuit breaker(s) to interrupt power to systems in abnormal situations where it is advisable, e.g., to recover system function. The applicant should show that the anticipated usage will not exceed the number of reset cycles for which the circuit breaker is qualified.</b> We distinguish between airplane systems normally turned on and off during normal operations, such as passenger convenience systems, and those systems normally powered at all times, such as flight deck multi-function displays or the flight-management computer. But if, for example, the flight-management computer did require power cycling regularly, for whatever reason, this system would be required to have a means to do this other than using the circuit breakers, unless the circuit breaker is specifically designed as a switch.</p>	

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<p>AIA/GAMA Comment no. <a href="#">18379-64</a></p>	<p>Page 5, Paragraph 3.h. ICAs do not “ensure” that circuit protection (or any other function) is retained throughout the expected service life. There is no maintenance program that can completely eliminate CPD failures that could defeat circuit protection. The sentence should say simply “The Instructions for Continued Airworthiness must include all the maintenance tasks required by 25.1739.”</p> <p>CPDs are now part of the newly defined EWIS, so 25.1529 is no longer applicable, only 25.1739. Delete reference to 25.1529.</p>	<p>The commenter requested the following change be made to the text. The text now reads:</p> <p><u>Instructions for Continued Airworthiness.</u> The Instructions for Continued Airworthiness (required by §§ 25.1529 and 25.1739) <b>must include all maintenance actions necessary to maintain the CPD covered by § 25.1357 so that circuit protection is ensured throughout the expected service life of the airplane or of the CPD.</b></p> <p>The commenter suggested revising the text to read:</p> <p><u>h. Instructions for Continued Airworthiness.</u> The Instructions for Continued Airworthiness (required by <del>§§ 25.1529 and</del> 25.1739) <b>must include all the maintenance tasks required by § 25.1739.</b></p>	<p>The FAA partially concurs. The intent of this paragraph is that the electrical component is maintained in its original design limits and performs its intended functions throughout its expected service life. See the revised text below.</p> <p>“... <b>must include all maintenance actions necessary to maintain the CPD covered by § 25.1357.</b>” <del>so that circuit protection is ensured throughout the expected service life of the airplane or of the CPD.</del></p>
<p>AIA/GAMA Comment no. <a href="#">18379-64</a></p>	<p>Page 5, Paragraph 3.i. —25.1357, in general, is applicable to all CPDs, not just the inaccessible ones. It is unclear why the analysis and testing requirements described in this paragraph are only applicable to inaccessible CPDs for modifications.</p>	<p>The commenter requested the following change be made to the text:</p> <p><u>i. Compliance Analysis and Testing.</u> Compliance with the requirements of § 25.1357 may be shown by analysis and appropriate tests. For new airplanes, <b>such analysis and tests should show compliance regardless of whether CPDs are accessible.</b> You should consider automatic CPD disconnections, including disconnections of CPDs used to protect buses or power</p>	<p>The FAA agrees with the commenter. The revised text is given below:</p> <p>... Compliance with the requirements of § 25.1357 may be shown by analysis and appropriate tests. <b>For new airplanes, such analysis and tests should show compliance regardless of whether CPDs are accessible.</b> You should</p>

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		<p>sources, in the same way as other failures are considered. You should apply this guidance to modifications to previously-certificated airplanes if –</p> <p style="padding-left: 40px;">new inaccessible CPDs are used, or existing accessible CPDs are moved to new inaccessible locations.</p>	<p>consider automatic CPD disconnections, including disconnections of CPDs used to protect buses or power sources, in the same way as other failures are considered. You should apply this guidance to modifications to previously-certificated airplanes if –</p>
<p>AIA/GAMA Comment no. <a href="#">18379-64</a></p>	<p>Page 4, Paragraph 3.d.(4). This paragraph requires fault clearing and isolation procedures to be approved by the cognizant ACO. There is no justification to require these specific procedures to always be approved by the ACO. If a delegated organization (or designee) is otherwise qualified to review and approve the procedures, it should be allowed to do so. To fence off certain procedures to require ACO approval is counter to all of FAA’s other delegation initiatives.</p>	<p>The commenter requested that we delete the approval requirement — by changing the text from:</p> <p><u>Fault-clearing and isolation procedures.</u> The airplane flight manual (AFM) or applicable AFM supplement should contain all fault-clearing and isolation procedures. These procedures should be approved by the cognizant Aircraft Certification Office.</p> <p>To read as follows:</p> <p>(4) <u>Fault-clearing and isolation procedures.</u> The airplane flight manual (AFM) or applicable AFM supplement should contain all fault-clearing and isolation procedures. <del>These procedures should be approved by the cognizant Aircraft Certification Office.</del></p>	<p>The FAA believes that even with a delegation in place, the ultimate approval responsibility resides with FAA. Therefore, no change is made.</p>