

the sensitivity of burnthrough performance to minor installation variations. As a result of this research, we are developing an advisory circular that describes acceptable methods of installation. The advisory circular addresses attachment schemes, overlap between the insulation and airframe structure and overlap of more than one insulation blanket. We recognize that other methods of installation may be equally acceptable, or necessary, particularly with insulation systems that are different from those described in the AC. However, an applicant would need to demonstrate that alternative approaches provide an equivalent level of safety. Such demonstrations would require testing of a scale appropriate to the feature being investigated.

One commenter disagrees with discussing detailed installation methods in an advisory circular. The commenter states that installation methods should be part of the rule, and not separated into an AC.

The FAA does not agree. The installation methods are, in fact, part of the regulation. However, in order to address the installation methods in the certification test method, the test fixture would have to be modified for each installation, which is impractical and could lead to a lack of standardization. In addition, it is doubtful that the scale of the oil burner test could adequately assess certain installation issues that would be significant in a post crash fire. For these reasons, we have elected to simplify the test method, and provide guidance on acceptable installation methods. An applicant is free to propose testing that would substantiate the actual installation, but we do not intend to require this when the advisory material covers the installation methodology.

One commenter states that the test method does not adequately address "non-conforming" materials, such as rigid foams, and could result in the placement of a fire barrier that is closer to the calorimeter than is the case for traditional blanket materials. The commenter contends that the relationship of the barrier to the calorimeter can affect the test results.

The FAA agrees that the relative position of the fire barrier and the calorimeter can influence the test results. However, we do not agree that moving the barrier closer to the calorimeter will always have negative effects. The relationship of the burner to the calorimeter is constant, so the relative performance of the barrier material, whatever it is, is based on the effect of the burner at the calorimeter location. To vary this relationship

would compromise the standardization of the test method. We recognize that the test method is only representative of, and not identical to, the actual fire threat. Therefore, an applicant would be free to demonstrate that a particular design approach provides the same level of safety if the applicant believes that the test setup does not adequately evaluate the design.

Operating Requirements in Parts 91, 121, 125, and 135

Newly Manufactured Airplanes

This final rule requires transport category airplanes operating under parts 91, 121, 125, and 135 to comply with the new standards relative to flame propagation in final § 25.856(a). This portion of the final rule applies to airplanes manufactured more than two years after the effective date of this final rule. These requirements are found in final §§ 91.613(b)(2), 121.312(e)(2), 125.113(c)(2), and 135.170(c)(2). We are adopting these requirements exactly as proposed in the NPRM except for adding the words "in the fuselage" to make clear that only thermal/acoustic insulation materials installed in the fuselage are subject to the requirements.

Since there are materials currently available that will meet the new standards, these requirements impose minimal additional costs. These requirements are applicable to airplanes manufactured more than two years after the effective date of the final rule. Two years is considered sufficient time to allow for material production capacity to be developed and for disposition of existing inventory.

Readers should note that these requirements differ from previous rulemaking related to flammability of materials in that the applicability to newly manufactured airplanes is not limited to operations under part 121. The reasons for this are that the rule adds minimal cost and the potential for an in-flight fire is not limited to air carrier operations.

In accordance with § 21.17, these new standards are applicable to new type certificates for which application is made after the effective date of the final rule. In addition to changing the design standards for future type certificate applications, we consider that the benefits from improved flammability standards can be realized for existing designs as well. The technology exists today so that these benefits can be obtained in a cost-effective manner by applying the standards under some circumstances to newly manufactured airplanes and to existing airplanes when insulating materials are replaced. Our

means for obtaining benefits earlier than would be provided by changing design standards is to revise the operating rules. Requirements for newly manufactured airplanes become a basic airworthiness requirement for those airplanes and apply throughout their service life. Requirements for the existing fleet relate to materials that are replaced in service. This latter aspect of the rule does not affect newly manufactured airplanes, since they are already required to comply by virtue of their date of manufacture.

Replacement of Existing Insulation

This final rule requires that thermal/acoustic insulation materials, when installed as replacements more than two years after the effective date of this final rule, meet the new flame propagation test requirements of final § 25.856(a). This requirement applies to existing transport category airplanes operating under parts 91, 121, 125, and 135 and to the same types of airplanes manufactured within two years of the effective date of this final rule. See final §§ 91.613(b)(1), 121.312(e)(1), 125.113(c)(1), and 135.170(c)(1). We are adopting these requirements exactly as proposed in the NPRM except for adding the words "in the fuselage" to make clear that only thermal/acoustic insulation materials installed in the fuselage are subject to the requirements.

This action provides for the gradual attrition of materials installed under earlier standards. Since there are existing materials that meet the new standards, and since those materials cost and weigh only marginally more than other materials, this should result in negligible additional cost to operators.

As with newly manufactured airplanes, it is appropriate to address not only those airplanes operated in part 121 air carrier service, but other operations as well, since the flame propagation portion of this final rule enhances safety over the current regulatory requirements, and can be done inexpensively.

Although it is difficult to quantify the benefits of piecemeal replacement of materials, the cost of replacement is low and adds minimal burden. This final rule allows time for attrition of current inventories and acquisition of new materials. Replacement insulation does not have to comply until two years after the effective date of this final rule. We expect this requirement to have little impact since only a relatively small amount of insulation materials are replaced every year.