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## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 25

[Docket No.: FAA-2008-1292; Amendment No. 25-131]

RIN 2120-AJ35

#### Flightcrew Alerting

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** The FAA is amending the airworthiness standards for transport category airplanes concerning flightcrew alerting. These standards update definitions, prioritization, color requirements, and performance for flightcrew alerting to reflect changes in technology and functionality. This amendment adds additional alerting functions, and consolidates and standardizes definitions and regulations for flightcrew warning, caution, and advisory alerting systems. This action will result in harmonized standards between the FAA and the European Aviation Safety Agency.

**DATES:** This amendment becomes effective January 3, 2011.

**FOR FURTHER INFORMATION CONTACT:** For technical questions concerning this rule, contact Loran Haworth, FAA, Airplane and Flightcrew Interface Branch (ANM-111), Transport Airplane Directorate, Aircraft Certification Service, 1601 Lind Avenue, SW., Renton, Washington 98057-3356; telephone (425) 227-1133; facsimile 425-227-1232; e-mail [Loran.Haworth@faa.gov](mailto:Loran.Haworth@faa.gov).

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#### SUPPLEMENTARY INFORMATION:

##### 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 promulgated under the authority described in subtitle VII, part A, subpart III, section 44701, "General requirements." Under that section, the FAA is charged with promoting safe flight of civil aircraft in air commerce by prescribing regulations and minimum standards in the interest of safety for the design and performance of aircraft that the Administrator finds necessary for safety in air commerce. This regulation is within the scope of that authority. It prescribes new safety standards for the design and operation of transport category airplanes.

##### Background

Section 25.1322 of Title 14, Code of Federal Regulations (14 CFR), became effective February 1, 1977,<sup>1</sup> and has never been amended. Since it was issued there have been many advances in the design and technology of flight deck alerting devices. The new technologies associated with integrated visual, aural, and tactile flightcrew alerts 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 § 25.1322. The word "alert" in the above context is a generic term used to describe a flight deck indication meant to attract the attention of the flightcrew and identify a non-normal operational or airplane system condition. Warnings, cautions, and advisories are considered to be categories of alerts.

Because § 25.1322 is outdated and lacks content commensurate with state-of-the-art flight deck display technology, applicants have to perform additional work when showing compliance to that regulation. This results in additional work for the FAA, which has to generate issue papers and special conditions when applicants want to install

advanced flight deck designs and current display technologies that are not addressed in § 25.1322.

##### Summary of the NPRM

The notice of proposed rulemaking (NPRM), Notice No. 09-05, published in the **Federal Register** on July 9, 2009 (74 FR 32810), is the basis for this final rule. The public comment period closed on September 8, 2009. In the NPRM, the FAA proposed to amend the airworthiness standards for flightcrew alerting in transport category airplanes. The proposed standards addressed regulations regarding definitions, prioritization, color requirements, and performance for flightcrew alerting. In the NPRM, the FAA also proposed to update the current standards to reflect the current technology and functionality for flightcrew alerting.

##### Summary of the Final Rule

The FAA is adopting this final rule to update the flightcrew alerting standards so they are relevant to the current technology. This includes adding additional alerting functions, and consolidating and standardizing definitions and regulations for flightcrew warning, caution, and advisory alerting systems. Adopting this rule also harmonizes flightcrew alerting standards between the FAA and the European Aviation Safety Agency (EASA). This rule will apply to applications for type certificates submitted after the effective date of the rule. This rule may also apply to applications for type design changes, including amended Type Certificates and Supplemental Type Certificates, submitted after the effective date of the rule, in accordance with § 21.101.

This final rule adopts the proposed rule with wording changes to improve clarity. Also, the order of certain paragraphs has been changed to improve the coherence of the rule.

##### Summary of Comments

The FAA received comments from 18 commenters, including civil aviation authorities, manufacturers, aviation associations, and the National Transportation Safety Board. All of the commenters generally supported the proposed changes to § 25.1322. Only the substantive comments are discussed below.

<sup>1</sup> Published in the **Federal Register** (41 FR 55467) on December 20, 1976; Amendment No. 25-38.

### Discussion of the Final Rule

The FAA received comments on the following general areas of the proposal:

- Reserving and limiting the use of alerting colors red, amber, or yellow on the flight deck.
- Restricting the use of yellow to caution alerts only.
- Restricting the use of certain colors for advisory alerts.
- Weather displays and terrain awareness and warning system (TAWS) displays.
- Requiring cues from two different senses for warning and caution alerts.
- Identifying an alert and determining corrective action.
- Minimizing and preventing the effects of false and nuisance alerts.
- Suppressing the attention-getting component of an alert caused by failure of the alerting function.
- Requiring that an alert presentation be removed once the condition no longer exists.
- Presenting alerts on multi-color displays.
- Presenting alerts on monochromatic displays.
- Prioritizing alerts within a given category.
- Applying the changed product rule.
- Economic impact.

Below is a more detailed discussion of the rule, as it relates to the comments the FAA received to the NPRM.<sup>2</sup>

### Reserving and Limiting the Use of Red, Amber, or Yellow on the Flight Deck

In the NPRM, the FAA proposed that visual alert indications shown on multi-color displays conform to the following color convention (proposed § 25.1322(d)):

- (1) Red for warning alert indications;
- (2) Amber or yellow for caution alert indications;
- (3) Any color except red, amber, yellow, or green for advisory alert indications.

The FAA also proposed that the use of red, amber, and yellow be reserved for alerting functions and that the use of these colors for functions other than flightcrew alerting must be limited and not adversely affect flightcrew alerting (proposed § 25.1322(f)).

After review, commenters' greatest concern with the proposed rule was the restriction imposed on color usage in the flight deck. However, following comments and internal FAA review, the final rule text now combines two sentences into one, to further clarify the intent to limit the use of certain colors.

<sup>2</sup> The full text of each commenter's submission is available in the public docket.

The final rule text for § 25.1322(f) states: "Use of the colors red, amber, and yellow on the flight deck for functions other than flightcrew alerting must be limited and must not adversely affect flightcrew alerting." The final rule text is harmonized with EASA. Airbus commented that the FAA's proposal to limit the use of red to only warning alerts is too restrictive. Airbus stated that some system failures may require immediate response during certain operations but not in others, and that the color coding must always consider the worst case scenario. Airbus proposed that paragraph § 25.1322(f) be revised to add: "However, deviations are acceptable for: (i) The use of red for failure flags on primary flight display and navigation display that may require immediate crew awareness and response;"

The FAA has changed the final rule text; however, these changes do not align with Airbus' proposal. The purpose of this final rule is to update the current standards to provide an increased level of safety. The FAA notes the trend in flightcrew alerting is toward reducing nuisance alerts by using smarter alerting, where the alerting system has built-in logic and knows when to display the alerts. The rule will require that alerting functions be designed to minimize the effects of false and nuisance alerts and prevent the presentation of these alerts when they are inappropriate. Red flags are one way to present visual warning information. However, alert indications that are similar in presentation but have two different meanings can be confusing to the flightcrew. Airbus' suggested text sets up a situation where certain red flags require immediate flightcrew response, while other red flags do not. This creates an opportunity for pilot error in determining the significance of the flag (since it has more than one meaning) and will slow the flightcrew's response to the flagged alert. Such a result is against the purpose of the rule. Additional guidance on flags is found in advisory circular (AC) 25.1322-1.

Airbus also commented that red, amber, and yellow are used for graphical depictions of weather phenomena and terrain elevation. The limitation in the last sentence of proposed paragraph § 25.1322(f) may be interpreted (or misinterpreted) as not allowing the use of red, amber, or yellow for weather displays and TAWS. Airbus proposed that paragraph § 25.1322(f) be revised to add:

However, deviations are acceptable for: (ii) The use of red and amber for weather display, terrain hazard [TAWS] and TCAS

[traffic collision avoidance system] sector, provided widely spread standards are used.

The FAA acknowledges that red, amber, and yellow have been used for weather radar, TAWS, and TCAS displays. However, the FAA does not agree that the suggestion to limit the use of these colors for alerts can be broadly interpreted as not allowing the use of red, amber, or yellow for weather radar, wind shear, TAWS, and TCAS. The FAA has guidance regarding colors that can be used on these specific displays in ACs and technical standard orders (TSO).<sup>3</sup> For example, AC 20-149 states that for flight information service-broadcast weather, red "should be associated with a need for immediate flightcrew awareness and/or conditions that represent serious near-term or serious potential threats to safety." Amber should be for flightcrew awareness of conditions that represent moderate near-term or moderate potential threats to safety. Also, AC 25-23 includes guidance stating that TAWS should be compliant with the requirements of § 25.1322 and use the color scheme specified in § 25.1322. The FAA guidance that recommends the use of red, amber, or yellow for indications other than alerts should be construed as FAA agreement that use of these colors comply with the published guidance of § 25.1322. Using these colors for indications other than alerts is acceptable if the use is limited and does not adversely affect flightcrew alerting. Paragraph (f) is intended to limit the use of these colors outside of flightcrew alerting features and functions in order to standardize their use within the flight deck, to protect their meaning, and to avoid diluting their attention-getting characteristics. However, it is not our intent to entirely prohibit their use for any other functions. If proposed for any

<sup>3</sup> AC 20-149, *Safety and Interoperability Requirements for Initial Domestic Flight Information Service-Broadcast*, 8/31/2005. AC 25-23, *Airworthiness Criteria for the Installation Approval of a Terrain Awareness and Warning System (TAWS) for Part 25 Airplanes*, 5/22/2000. AC 25-11A, *Electronic Flight Deck Displays*, 06/21/2007. AC 25-12, *Airworthiness Criteria for the Approval of Airborne Windshear Warning Systems in Transport Category Airplanes*, 11/2/87. AC 20-131A, *Airworthiness Approval of Traffic Alert and Collision Avoidance Systems Aircraft Flight Information Services-Broadcast (FIS-B) Data Link Systems and (TCAS II) and Mode S Transponders*, 03/29/1993. AC 20-149, *Safety and Interoperability Requirements for Initial Domestic Flight Information Service-Broadcast*, 08/31/2005. TSO-C117, *Airborne Windshear Warning and Escape Guidance Systems for Transport Airplanes*, 01/10/1990. TSO-C147, *Traffic Advisory System (TAS) Airborne Equipment*, 4/16/1998. TSO-C151b, *Terrain Awareness and Avoidance System*, 12/17/2002. TSO-C157, *Aircraft Flight Information Services-Broadcast (FIS-B) Data Link Systems and Equipment*, 9/20/2004.

functions other than flightcrew alerting, an applicant would have to show an operational need to use these colors for other purposes. For example, using these colors for marketing or other non-safety related functions is typically not appropriate. Even if an applicant can show there is an operational need, using these colors for non-flightcrew alerting purposes would not be permitted if flightcrew alerting is adversely affected.

Consistent use and standardization for red, amber, and yellow is required to retain the effectiveness of flightcrew alerts. The flightcrew should not become desensitized to the meaning and importance of color coding for alerts. This rule will limit the frequency and use of red, amber, and yellow to flightcrew alerting-related functions in the flight deck. This limitation is also necessary to avoid desensitizing pilots to the urgency that should be associated with the meaning of these colors, which could increase the flightcrew's processing time, add to their workload, and increase the potential for flightcrew confusion or errors. Any proposed uses of these colors for non-alerting features or functions must show that they do not have any of these adverse effects.

Weather radar and TAWS displays are examples of displays that comply with this regulation. There is a demonstrated operational need for these systems to impart safety-related information—for example, when the nearby terrain presents a threat because it is near and at or above the airplane's flight trajectory—using these colors in a limited way. Additionally, the FAA has found that these displays do not adversely affect flightcrew alerting.

For future certification projects that require demonstrated compliance to this regulation, existing and previously-approved uses of these colors for features and functions other than flightcrew alerting will be evaluated under the criteria described above.

Boeing suggested adding "advisory" as an alert for functions other than flightcrew alerting that must not adversely affect flightcrew alerting. Boeing stated that the color for advisory alerts must be reserved for the same reason the colors for warning and caution alerts are being protected.

The FAA agrees that the final rule could include additional limitations regarding the use of certain colors in the flight deck. However, reserving the color used for advisory alerts was not included in the proposed rule because advisory alerts would further restrict available colors for other uses, the number of colors that can be distinguished under all foreseeable conditions is already a limited set, and

advisory alerts do not require immediate awareness.

The guidance in AC 25-11A recommends as a best practice to use six colors or less in a typical deck to display all of the information necessary to safely operate the airplane. Since Boeing currently uses amber for both caution and advisory alerts, it has already limited the colors it uses for flightcrew alerting to two: Red for warning alerts, and amber for caution and advisory alerts. This allows Boeing to use four additional colors for flight deck displays. However, an unequal burden would be placed on those original equipment manufacturers that followed the FAA guidance in AC 25-11<sup>4</sup> and used a color other than amber for advisory alerts. Those original equipment manufacturers would only have three additional colors to use throughout the flight deck because three colors are already reserved for flightcrew alerting: Red for warning, amber or yellow for caution, and whatever color they chose for advisory alerts. Although colors used for advisory alerts are not restricted in this rule, these alerts must still be colored so as to perform their intended function. The FAA will include guidance language in AC 25.1322-1 regarding restrictions on the colors that should be used for advisory alerts.

Boeing also commented that limiting the use of color for functions other than flightcrew alerting is beyond the scope of the proposed rule, and can even conflict with other rules, advisory material, and industry standards for the use of color. As an example, Boeing cited § 25.1549, *Powerplant and auxiliary power unit instruments*, which prescribes color requirements for the use of red and yellow on engine instruments.

The FAA has determined that limiting the use of red, amber, and yellow on the flight deck for functions other than alerting is within the scope of this rule. The FAA's intent is to limit the widespread use of red, amber, and yellow in the flight deck so when a pilot sees one of these colors the pilot can quickly identify that indication as an alert. Similar wording was recommended in the ARAC final report. As explained above, the proposed rule stated that the use of red, amber, or yellow for functions other than flightcrew alerting must be limited and must not "adversely affect" flightcrew alerting. Section 25.1322(f) of the final rule has been revised to emphasize that use of the colors red, amber, and yellow on the

flight deck for functions other than flightcrew alerting must be limited and must not adversely affect flightcrew alerting.

Regarding Boeing's comment that limiting the use of color for functions other than flightcrew alerting might conflict with other rules, specifically § 25.1549 on engine instruments, neither proposed nor final § 25.1322 would prohibit compliance with the color requirements of § 25.1549. The required use of red and yellow in that section is consistent with the warning and caution criteria of this rule.

#### **Requiring That Yellow Only Be Used for Caution Alerts**

Proposed § 25.1322(d)(2) would have required that amber or yellow be used for caution alerts. Airbus stated that this proposed requirement was too restrictive. The color yellow is extensively used in all Airbus flight decks, but not for alerting purposes. Yellow is used to distinguish between displays that indicate systems and operations are normal and displays that indicate there is a problem.

One reason the FAA proposed to limit the use of yellow was that amber and yellow are visually similar—research studies, discussed in the original version of AC 25-11, indicate high color confusion between yellow and amber. Further, yellow is already used to indicate cautionary ranges on some electronic and mechanical displays. The ARAC final report also made the same recommendation to limit the use of yellow. In addition, the original version of AC 25-11 included a statement that "the extensive use of the color yellow for other than caution/abnormal information is discouraged." The guidance in AC 25-11A states: "Use of the color yellow for functions other than flightcrew alerting should be limited and should not adversely affect flightcrew alerting." Therefore, Airbus may continue to use yellow to indicate normal operation and airplane system conditions, but only if use of this color is limited and Airbus can demonstrate that there is no adverse effect on flightcrew alerting. The intent of the proposed rule is retained in this final rule but the text has been revised for clarity.

#### **Restricting the Use of Certain Colors for Advisory Alerts**

Proposed § 25.1322(d)(3) would have prohibited the use of red, amber, yellow, or green for advisory alerts. Boeing and Airbus objected to the inclusion of amber and yellow in this proposed restriction and provided the following reasons:

<sup>4</sup> AC 25-11, *Transport Category Airplanes Electronic Display Systems*, 16 July 1987.

(1) There are no known incidents or accidents that can be attributed to the inability of the flightcrew to distinguish between caution and advisory alerts.

(2) There are a limited number of display colors available for use on flight deck displays.

(3) The use of certain colors for advisory level alerts is already widespread in the aviation industry.

(4) If an advisory alert is presented in any color other than amber or yellow the flightcrew would not perceive the alert as non-normal.

Boeing suggested that, instead of prohibiting the use of certain colors, there should be a requirement that the alert categories be readily distinguishable from each other. Boeing and Airbus both agreed that red should not be used for advisory alerts.

The FAA concurs with the reasons provided by the commenters and has removed the restriction. The final rule allows the use of amber or yellow for advisory alerts, as was allowed in the ARAC final report. However, in AC 25.1322, the FAA will recommend that a separate and distinct color be used when possible. The AC will also recommend that, if color is not used to distinguish between caution and advisory alerts, any alternate coding technique must meet the general requirements of § 25.1322(a)(2) so the flightcrew can readily and easily detect the difference between caution and advisory alerts.

#### Using Green for Advisory Alerts

The FAA received several comments regarding the use of the color green. Cessna recommended that green be used for advisory alerts and that green should be mentioned in the final rule. Embraer asked that the requirements clearly address the use of the color green. Airbus stated that prohibiting green for advisory alerts is too restrictive. The General Aviation Manufacturers Association (GAMA) wanted to retain the use of green to indicate that systems are safely operating. GAMA requested that the proposed rule be changed to specify that green must be used to identify a safe operation and that in some instances yellow may also be used for non-cautionary alerts.

The FAA finds the suggestion to use green for normal operation and system conditions to be outside the scope of this final rule. Alerts are associated with non-normal operation or system conditions, not normal conditions. The FAA's original intent in the proposed requirements for § 25.1322 was to address only non-normal operation or system conditions. The final rule text has been revised for clarity and

§ 25.1322(a)(1)(i) now states that flightcrew alerts must "[i]dentify non-normal operation or airplane system conditions \* \* \*."

Further, the FAA already provides a recommendation for using green to indicate that systems are normal in AC 25-11A, Table 11 (recommended colors).

#### Limiting the Colors That Can Be Used for Weather Displays and TAWS Displays

Airbus and a private citizen commented that the color "green" should be allowed for weather displays, TAWS, and TCAS. Airbus proposed that red, amber, yellow, and green should be allowed for weather displays and TAWS displays with no restrictions or limitations. Airbus also commented that magenta is used in the weather radar system to provide "turbulence ahead" alerts and in TAWS for advisory alerts. The private citizen stated that the definition within the color radar guidance calls the various colors "warnings," including the use of green for a "minimum warning."

As previously mentioned, Table 11 in AC 25-11A lists recommended colors for certain functions. Table 12 in AC 25-11A provides specific colors for certain display features. The color magenta is typically used for an instrument landing system deviation pointer, and for a selected heading and active route/flight plan. Green is typically used to indicate engaged modes and normal conditions, current data, and values. As adopted, § 25.1322(e) requires that red be used for warning alerts, yellow or amber for caution alerts, and any other color except red and green for advisory alerts.

This final rule will not allow the use of magenta for a warning or caution category alert. However, magenta can be used on weather displays for awareness of turbulence and heavy rain. Green can also be used on a weather display and typically indicates areas of light rainfall. The FAA could not find any references to using green for "minimum warning." Section 25.1322 does not allow use of the color green for a non-normal alert. Use of the colors green and magenta for awareness on a weather display is acceptable if it is within the manufacturer's color philosophy to use these colors for that purpose.

A consistent and standardized color usage is desirable to ensure the pilot understands the urgency of an alert based on its color. The manufacturer and the FAA should evaluate inconsistencies in color usage to ensure that these do not lead to confusion or errors, and do not adversely impact the

intended function of the system(s) involved. Color usage should adhere to the color coding guidance in AC 25-11A.

The FAA has tasked ARAC with updating the guidance in AC 25-11A for weather displays in transport category airplanes. To meet this goal, ARAC has re-convened the ASHWG, which is working with industry and professional organizations.<sup>5</sup> For weather displays, TAWS, TCAS, or any other piece of flight deck equipment, other regulations (for example, § 25.1309(c)) determine whether any particular flight deck indication serves the function of an alert (for example, whether it identifies "non-normal" operation). If a flight deck indication is determined to be an alert, this indication must then comply with the requirement of § 25.1322.

WSI Corporation, a company that provides a subscription service for aviation weather information, commented that the proposed rule would not standardize color usage for the presentation of datalink radar, warm fronts, and low pressure systems. WSI stated that the proposed rule language would slow the adoption of proven technology or create non-standard presentations of weather phenomena, because designers would each have their own interpretation of what is meant by a display that does "not adversely affect flightcrew alerting."

The FAA understands this commenter's concern regarding non-standard presentations on weather displays. The FAA did not intend to use § 25.1322 to standardize color usage for datalink radar, warm fronts, or low pressure system displays. The FAA does intend to include guidance on how to comply with the requirement that using red, amber, and yellow on the flight deck for functions other than flightcrew alerting must be limited and must not adversely affect flightcrew alerting. If an applicant chooses to use alerting colors for non-alerting functions, that applicant is responsible for showing that the use of these colors is limited, meets an operational need, and does not cause an adverse effect on flightcrew alerting. The determination of what is considered adverse depends not only on the actual display but also on how the display is integrated on the flight deck. The adverse effect associated with using alerting colors for non-alerting functions is that the flightcrew may spend extra time to determine whether a flightcrew alert actually occurred and, if so, its meaning. In general, use of alerting

<sup>5</sup> One organization is SAE Technical Committee G-10, Aerospace Behavioral Engineering Technology.

colors for non-alerting purposes would be considered adverse effects when such use: (1) Interferes with the flightcrew's ability to identify non-normal operation or airplane system conditions, (2) slows the flightcrew's awareness of and response to an alert, (3) slows the flightcrew's ability to determine the appropriate actions, and (4) interferes with the flightcrew's ability to readily and easily detect and understand the alert under all foreseeable operation conditions. Since several factors determine whether using alerting colors for non-alerting purposes will have an adverse effect, evaluations during simulations or flight tests will usually be required. Alerting components found on weather displays must follow the requirements in this final rule. As previously mentioned, ARAC is currently tasked with developing recommendations for a revision to AC 25-11A that will address guidance for weather displays in transport category airplanes.

#### **Requiring Cues From Two Different Senses for Warning and Caution Alerts**

Proposed § 25.1322(a)(1) would have required attention-getting cues through at least two different senses. Cessna agreed that warning alerts should have two sensory cues. However, it did not agree that all caution alerts must require two sensory alerts. Cessna also stated that the priority of the alert should determine if two sensory alerts are necessary (for example, safety of flight issue).

The FAA's reason for the two sensory alerts requirement is that both warning and caution alerts require immediate flightcrew awareness, and adding the requirement for getting attention through a second sense helps to ensure flightcrew awareness. The two sensory alerts requirement is supported by ARAC recommendation and by the NTSB's comments to the NPRM. The final rule retains this safety requirement.

#### **Identifying Alerts and Determining Corrective Action**

The Air Line Pilots Association, International, and Boeing commented that the term "[d]etermine corrective action" in proposed § 25.1322(a)(2) could be interpreted three different ways. It could be a requirement (1) to provide specific instructions on the alerting display; (2) that the alert determine the correct action, or (3) that the flightcrew determine the correct action or respond to an alert condition. These commenters stated that the alert should "help" the flightcrew determine the correct action.

Although the FAA believes that the proposed language in § 25.1322(a) implies flightcrew decision-making rather than a reduction in pilot decision-making or authority, we have clarified and reorganized § 25.1322(a) in the final rule. Section 25.1322(a)(1) requires that flightcrew alerts provide the flightcrew with the information needed to (1) identify non-normal operation or airplane system conditions, and (2) determine the appropriate actions, if any. The FAA did not incorporate the commenters' suggestions to include the words "help" or "allow" in the final rule because those words would weaken the requirement that the system needs to provide sufficient information for the flightcrew to make an informed decision. Also, the FAA and industry acknowledge that, in some situations, time-critical alerts must be direct.

#### **Deleting the Words "Less Urgent" in the Definition of Caution Alert**

The text for § 25.1322(b)(2) proposed that alerts conform to a prioritization hierarchy that included a caution alert for conditions that require immediate flightcrew awareness and less urgent flightcrew response. A private citizen, Boeing, and EASA recommended removing the words "less urgent," or as an alternative define what this term means.

The FAA agrees with the commenters' suggestions and § 25.1322(b)(2) has revised the caution alert to require immediate flightcrew awareness and subsequent flightcrew response.

#### **Minimizing and Preventing the Effects of False and Nuisance Alerts**

Proposed § 25.1322(c) required the presentation of alerts be designed to minimize nuisance effects and, specifically, (1) permit each occurrence of attention-getting cues to be acknowledged and suppressed, (2) prevent the presentation of an inappropriate or unnecessary alert, (3) remove the alert when the condition no longer exists, and (4) provide a means to suppress an attention-getting component of an alert caused by a failure of the alerting system that interferes with the flightcrew's ability to safely operate the airplane.

EASA and Cessna expressed concern that inappropriate or unnecessary alerts could not be fully prevented and that the requirement to "prevent" might be too stringent. GAMA was concerned that the term "minimize" would set a continually moving regulatory target and requested that the FAA clarify the intent of this requirement.

In response to EASA and Cessna, the FAA's intent was to emphasize that features to prevent inappropriate or unnecessary alerts should be a part of the design process for how to present alerts. In response to GAMA, the FAA will include methods of compliance for "minimizing" nuisance effects in AC 25.1322-1. GAMA is correct in assuming that, as future methods and technologies become more capable of minimizing the effects of false and nuisance alerts, the FAA will expect industry to use best practices to minimize these effects.

In the final rule, the FAA moved the requirements of proposed § 25.1322(c) to a new paragraph § 25.1322(d) and added the words "the effects of false and" to the introductory sentence. That introductory sentence now states "[t]he 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." This rule text was harmonized with EASA.

#### **Suppressing the Attention-Getting Component of an Alert Caused by Failure of the Alerting Function**

Proposed § 25.1322(c)(4) requires the flightcrew alerting system provide a means to suppress an attention-getting component of an alert caused by a failure of the alerting system that interferes with the flightcrew's ability to safely operate the airplane. Airbus and Embraer asked what part of the alert would be suppressed, the attention-getting component or the alert itself? Embraer also asked:

- How does the FAA propose to alert the crew of failure of the alerting system itself?
- Does this refer to global suppression or suppression of a single event?

The scenario that the FAA envisioned when proposing this requirement is when an alert's attention-getting component (for example, continuous aural alerts or continuous flashing lights) interferes with the flightcrew's ability to safely operate the airplane. Manufacturers must provide a means, through their design, to suppress the attention-getting component(s). This rule did not envision a complete failure of the alerting system, just the interference of attention-getting components due to the failure of an alerting function. If a more-thorough alerting system failure triggers the need to inform the flightcrew, the equipment manufacturers are responsible for determining how the flightcrew will be alerted.

Where failure of the alerting function interferes with the flightcrew's ability to safely operate the airplane, the proposed rule did not specify global suppression or suppression of a single event because such suppression (global or single event) would depend on the particular system design and trigger for the false alert. The intent of the rule is to suppress only the attention-getting component that may cause pilot distraction. The final rule was not changed in response to this comment.

#### **Removing the Presentation of an Alert When the Condition No Longer Exists**

Proposed § 25.1322(c)(3) would require that an alert be removed when the condition that initiated the alert no longer exists. Airbus commented that this proposed requirement should be flexible enough to allow some tolerances or exceptions, notably when data or parameters required to determine the condition are not available. Airbus also proposed that paragraph § 25.1322(c)(3) be modified to require confirmation that the condition no longer exists, except if justified.

The FAA has determined that the alerting function that created the alert should be intelligent enough to remove the alert when the condition no longer exists and there is no longer any need for pilot awareness or action. If for any reason, including loss of data, the systems on the airplane are unable to determine that the condition associated with the alert no longer exists, but the alert persists, the pilot should usually assume that the condition still exists. We believe an alert that is no longer relevant would add clutter to the display and could confuse and distract the flightcrew from attending to other alerts. The commenter did not provide and we are not aware of any situation that would justify retaining an alert when the condition no longer exists. The proposal is adopted without change.

#### **Presenting Alerts on Multi-Color Displays**

Proposed § 25.1322(d) would require visual alert indications that are shown on multi-color displays to conform to the following color convention:

- (1) Red for warning alert indications.
- (2) Amber or yellow for caution alert indications.
- (3) Any color except red, amber, yellow, or green for advisory alert indications.

EASA commented that using color for alert should be standard; and the term "alert" is already defined as an indication and the words "that are shown on multi-color displays" should

be removed. In addition, EASA commented that using color for alerts should be the standard. Boeing commented that the ARAC recommendation purposefully refrained from specific technological implementations such as lights, color displays, monochromatic displays, head-up displays (HUDs), and tactile and aural devices. The ARAC recommendation was based on functions, not specific technology. Proposed § 25.1322(d) deviated from the ARAC recommendations in a way that would have unintended effects contrary to the overall objective of an improved minimum safety standard. For example: Master warning and caution lights are not on a multi-color display and yet the color requirements must still apply.

Language from the ARAC final report is shown below:

"(d) Alerts must conform to the following color convention for visual alert indications:

- (1) Red for warning alert indications.
- (2) Amber/yellow for caution alert indications.
- (3) Any color except red or green for advisory alert indications."

The FAA and EASA agree with the commenter that this proposal would not allow for alerts on monochromatic HUDs, even though certain time-critical alerts on HUDs are in use today. However, the FAA believes there is a safety benefit for appropriately-designed alerts appearing on HUDs, and modified ARAC recommendation to allow for alerts appearing on HUDs and monochromatic displays. Although the FAA and EASA reached agreement on harmonized language for multi-color capable and monochromatic displays for visual alerts, the FAA now recognizes that this agreed-to language does not fully address alerting functions such as master caution and master warning lights, which are also considered monochromatic displays since they are capable of providing only a single alerting color.

In response to these comments, the FAA revised paragraph § 25.1322(e) in this final rule to emphasize the use of color for alerts and to also address single-color displays that provide alerting colors (for example, master warning and master caution alerts). The revised rule text also renders the regulation less technology-specific.

#### **Presenting Alerts on Monochromatic Displays**

Proposed § 25.1322(e) required visual alert indications shown on monochromatic displays use display coding techniques such that the flightcrew can clearly distinguish

between warning, caution, and advisory alert categories.

EASA stated that the use of color for alerts should be the standard, and other techniques should be considered only in cases where color is not possible (for example, monochromatic displays and HUDs).

The FAA agrees with EASA; however, if color use is not possible to indicate, separate, and standardize between alert categories, other coding techniques must be used that are as effective as the color standard. The FAA does not want to prescribe coding techniques (other than color) that may be used by applicants to distinguish the alert categories. However, the coding must meet all of the applicable requirements in this final rule to ensure the alerts are readily and easily detectable and intelligible by the flightcrew, including conditions which present multiple alerts (§ 25.1322 (a)(2)).

Boeing stated that if alerts were made visually distinctive by category on a head-down display (HDD), and were duplicated on a monochromatic display, then the duplicate alert on the monochromatic display does not need to be distinguishable by category. For example, if the presentation of an alert on HDDs was distinctive so as to easily identify its category of alert, then the duplicate alert on monochromatic HUDs does not need to be visually distinctive. Other alert information presented simultaneously, such as aural alerts, presence of master lights, and visual information on HDDs, provides sufficient cues to the flightcrew to determine the correct response and urgency of response.

The FAA disagrees with Boeing's comment "that alerts need not be visually distinctive so the alert category can be easily determined" on the HUD. It is a key requirement of the visual alert indication to distinguish its category, regardless of whether the presentation is head-up or head-down. The safety objective for visual alert indications is that they clearly signify the urgency of the alert and the need for immediate intervention, if applicable. A visual alert indication that does not distinguish the alert category (for example, warning, caution, or advisory) would fail to properly convey its urgency. The FAA does not expect a pilot using the HUD to also scan the head-down primary flight display, so the pilot may miss what is only on the head-down display. If the visual indication of the head-down primary flight display distinguishes the alert category, but the indication on the HUD does not, it fails to meet the safety objective for this rule.

The FAA revised § 25.1322(e)(2) in the final rule to clearly state that visual alert indications must conform to the prescribed color convention unless it is not possible to comply with the convention. The additional language was needed to address the situation where a monochromatic display is capable of providing only a single alerting color, such as red for a master warning, or yellow or amber for a master caution light. Adding this language also makes the regulation less technology-specific, as recommended by ARAC and commenters.

#### **Prioritizing Alerts Within a Given Category**

Proposed § 25.1322(b) would have required that alerts conform to a prioritization hierarchy based on category, but it did not require alerts to be prioritized within a given category. EASA commented that this additional prioritization should be required. EASA also suggested that the information in proposed § 25.1322(b) be reorganized and moved to a new § 25.1322(c)(1).

The FAA agrees with both suggestions. For alerts to perform their intended function as required by § 25.1301,<sup>6</sup> they must be prioritized when more than one alert is displayed at the same time. The FAA has revised new § 25.1322(c)(1) to require that alerts be prioritized with a given category. A typical example of prioritizing alerts within categories is the time-critical warning alert which, to meet its intended function, must have higher priority on a display than a general warning alert. This change to the final rule strengthens the case for prioritizing alerts within categories that was part of the original ARAC recommendations. Guidance for this additional prioritization is available in AC 25.1322-1.

#### **Economic Impact**

GAMA and a private citizen commented on the Regulatory Flexibility Analysis. They suggested that the rule would affect other organizations in addition to the five transport category airplane manufacturers discussed in the Analysis. They commented that the proposed rule contained new regulations which would apply to organizations that design and certify equipment installations in the flight deck under supplemental type certificate (STC) approvals and design components for installation in the flight deck under the FAA's technical standard order (TSO) program.

Additionally, the regulations would affect modification shops that use the field approval process for installing equipment in the flight deck. Both GAMA and a private citizen recommended that the FAA address these affected organizations with respect to cost, benefit, and small business impact.

GAMA also commented that neither the proposed regulation, nor the associated guidance material, discussed issues related to the Changed Product Rule (14 CFR 21.101) and how modifications to the flight deck which affect or contain alerting functions should be addressed. GAMA was particularly concerned about the effect of changing an existing alerting scheme as a result of a minor change in the flight deck.

The FAA disagrees. This rule applies only to type certificate applications for transport category airplanes submitted after the rule's effective date and to certain amended type certificate (TC) and supplemental TC (STC) applications submitted after that date.

Modification shops are not permitted to obtain field approvals for significant product-level changes, so we do not anticipate any direct impact of this rule on that type of business. A minor change to the flight deck would not be considered a significant product-level change, so updating the existing alerting scheme would not be required for minor changes.

There may be some future applications for STC approval of significant product-level design changes that would affect flightcrew alerting. The FAA expects that the requirements of § 21.101 will determine which future design changes would need to have the certification bases updated to include the requirements in this final rule. The FAA addressed these additional costs of updating a certification basis in the economic evaluation for § 21.101.<sup>7</sup>

#### **Unfunded Mandates Assessment**

GAMA commented that this rule may generate an unfunded mandate. The FAA calculated the cost of this rule and it does not create an unfunded mandate.

#### **Regulations Affecting Intrastate Aviation in Alaska**

GAMA commented that this rule would directly impact the cost of installing flight decks in existing airplanes which operate in support of commerce and the public benefit in Alaska. The FAA has determined that

this rule will not affect any existing airplanes.

#### **Harmonizing Rule Text Between the FAA and EASA**

Boeing and Airbus expressed concern because the proposed rule deviated in some areas from the ARAC recommendations and there might be conflicts between the FAA and EASA regulations. The FAA and EASA have harmonized on the rule text. The principles behind the ARAC recommendations were closely followed.

#### **Paperwork Reduction Act**

The Paperwork Reduction Act of 1995 (44 U.S.C. 3507(d)) requires that the FAA consider the impact of paperwork and other information collection burdens imposed on the public. We have determined that there is no current or new requirement for information collection associated with this amendment.

#### **International Compatibility**

In keeping with U.S. obligations under the Convention on International Civil Aviation, it is FAA policy to conform to International Civil Aviation Organization (ICAO) Standards and Recommended Practices to the maximum extent practicable. The FAA has determined that there are no ICAO Standards and Recommended Practices that correspond to these regulations.

#### **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 (Pub. L. 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

<sup>7</sup> 14 CFR 21.101, *Designation of applicable regulations* (commonly known as the Changed Product Rule).

<sup>6</sup> 14 CFR 25.1301, *Function and Installation*.

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 final 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 determined that this final 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) is "significant" as defined in DOT's Regulatory Policies and Procedures; (4) will not have a significant economic impact on a substantial number of small entities; (5) will not create unnecessary obstacles to the foreign commerce of the United States; and (6) will not impose an unfunded mandate on State, local, or tribal governments, or on the private sector, by exceeding the threshold identified above. These analyses are summarized below.

#### *Total Benefits and Costs of This Rule*

The estimated cost of this final rule over the 20-year analysis period is \$7.7 million (\$4.1 million present value). The estimated potential benefits of this final rule over the 20-year analysis period, consists of preventing at least 10 serious injuries worth \$8.3 million (\$4.4 million present value).

#### *Persons Potentially Affected by This Rule*

- Manufacturers of future part 25 airplanes.
- Manufacturers of future instrument panel avionics for future part 25 airplanes.

#### *Assumptions*

Discount rates—7%.

Analysis period—2010 through 2029 (twenty years).

#### *Changes From the NPRM to the Final Rule*

There were no substantive changes made to the Regulatory Evaluation, Regulatory Flexibility Analysis, or Unfunded Mandates Assessment as a result of comments received on the NPRM.

#### *Benefits of This Rule*

For future part 25 airplanes, we estimated that the rule changes would avoid about 10 serious injuries over a 20-year period. The resulting benefits include averted fatalities and injuries,

loss of airplanes, investigation cost, and collateral damages. The total benefits are about \$4.4 million in present value terms.

#### *Costs of This Rule*

There are no additional manufacturing or operating costs associated with this rule; however, there are additional design and certification costs to future part 25 airplane manufacturers. The average cost estimate per new airplane certification is \$0.7 million. The estimated number of new certifications annually is 0.55. When the average cost estimate per new airplane certification (\$0.7 million) is multiplied by the estimated annual number of new certifications (0.55), the estimated annual costs are \$385,000. When summed over the 20-year analysis period the total cost of this rule is about \$4.1 million in present value terms.

#### **Regulatory Flexibility Determination**

The Regulatory Flexibility Act of 1980 (Pub. L. 96–354) (RFA) establishes "as a principle of regulatory issuance that agencies shall endeavor, consistent with the objectives of the rule and of applicable statutes, to fit regulatory and informational requirements to the scale of the businesses, organizations, and governmental jurisdictions subject to regulation. To achieve this principle, agencies are required to solicit and consider flexible regulatory proposals and to explain the rationale for their actions to assure that such proposals are given serious consideration." 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 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 RFA.

However, if an agency determines that a rule is not expected to have a significant economic impact on a substantial number of small entities, section 605(b) of the 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.

Section 603 of the Act requires agencies to prepare and make available for public comment a final regulatory flexibility analysis (FRFA) describing the impact of final rules on small entities. Section 603(b) of the Act

specifies the content of a FRFA. Each FRFA must contain:

- A description of the reasons why action by the agency is being considered;
- A succinct statement of the objectives of, and legal basis for, the final rule;
- A description and an estimate of the number of small entities to which the rule will apply;
- A description of the projected reporting, record keeping and other compliance requirements of the final rule, including an estimate of the classes of small entities which will be subject to the requirement and the type of professional skills necessary for preparation of the report or record;
- An identification, to the extent practicable, of all relevant Federal rules which may duplicate, overlap, or conflict with the final rule.
- Each final regulatory flexibility analysis shall also contain a description of any significant alternatives to the final rule which accomplish the stated objectives of applicable statutes and which minimizes any significant economic impact of the final rule or small entities.

GAMA and a private citizen commented on the initial regulatory flexibility analysis. The FAA's responses to these comments were responded to earlier in the "Summary of Comments" section of this preamble. The FAA believes this final rule will not have a significant impact on a substantial number of small entities because all United States transport-aircraft category manufacturers exceed the Small Business Administration small-entity criteria of 1,500 employees. In addition, the alerting system design firms contacted by the FAA for preparation of the initial regulatory evaluation did not consider that they would incur any additional costs as a result of the proposed rule.

Therefore, as the FAA Administrator, I certify that this rule will not have a significant economic impact on a substantial number of small entities.

#### **International Trade Impact Analysis**

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 any standards or engaging in related activities that create unnecessary obstacles to the foreign commerce of the United States. Pursuant to these Acts, the establishment of 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 FAA notes the purpose is to ensure the safety of the American public, and has assessed the effects of this rule to ensure it does not exclude imports that meet this objective. As a result this rule is not considered as creating an unnecessary obstacle to foreign commerce.

#### 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 with the base year 1995) in any one 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 value of \$143.1 million in lieu of \$100 million.

This final rule does not contain such a mandate. The requirements of Title II do not apply.

#### Executive Order 13132, Federalism

The FAA has analyzed this final rule under the principles and criteria of Executive Order 13132, Federalism. We determined that this action will not have a substantial direct effect on the States, or the relationship between the Federal Government and the States, or on the distribution of power and responsibilities among the various levels of government, and, therefore, does not have federalism implications.

#### Regulations Affecting Intrastate Aviation in Alaska

Section 1205 of the FAA Reauthorization Act of 1996 (110 Stat. 3213) requires the FAA, when modifying its regulations 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. In the NPRM, we requested comments on whether the proposed rule should apply differently to intrastate operations in Alaska. We received one comment from GAMA stating that this rule will directly impact the cost of installing flight decks in existing airplanes which operate in support of commerce and the public benefit in Alaska. We have determined that this rule will not affect any existing airplanes and, based on the administrative record of this rulemaking, there is no need to make

any regulatory distinctions applicable to intrastate aviation 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 rulemaking action qualifies for the categorical exclusion identified in paragraph 312(f) and involves no extraordinary circumstances.

#### Regulations That Significantly Affect Energy Supply, Distribution, or Use

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

#### 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/](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 amendment number or docket number of this rulemaking.

Anyone is able to search the electronic form of all comments received into any of our dockets by the name of the individual submitting the comment (or signing the comment, if submitted on behalf of an association, business, labor union, etc.). You may review DOT's complete Privacy Act statement in the **Federal Register** published on April 11, 2000 (Volume 65, Number 70; Pages 19477-78) or you may visit <http://DocketsInfo.dot.gov>.

#### Small Business Regulatory Enforcement Fairness Act

The Small Business Regulatory Enforcement Fairness Act (SBREFA) of 1996 requires FAA to comply with

small entity requests for information or advice about compliance with statutes and regulations within its jurisdiction. If you are a small entity and you have a question regarding this document, you may contact your local FAA official, or the person listed under the **FOR FURTHER INFORMATION CONTACT** heading at the beginning of the preamble. You can find out more about SBREFA on the Internet at [http://www.faa.gov/regulations\\_policies/rulemaking/sbre\\_act/](http://www.faa.gov/regulations_policies/rulemaking/sbre_act/).

#### List of Subjects in 14 CFR Part 25

Aircraft, Aviation safety, Reporting and recordkeeping requirements, Safety, Transportation.

#### The Amendment

■ In consideration of the foregoing, the Federal Aviation Administration amends Chapter I of Title 14, Code of Federal Regulations as follows:

#### PART 25—TITLE AIRWORTHINESS STANDARDS: TRANSPORT CATEGORY AIRPLANES

■ 1. The authority citation for part 25 continues to read as follows:

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

■ 2. Revise § 25.1322 to read as follows:

#### § 25.1322 Flightcrew alerting.

(a) Flightcrew alerts must:

- (1) Provide the flightcrew with the information needed to:
  - (i) Identify non-normal operation or airplane 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 this section 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 airplane. 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 announcement 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 or green for advisory alert indications.

(2) Use visual coding techniques, together with other alerting function elements on the flight deck, 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 this section.

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

Issued in Washington, DC, on October 20, 2010.

**J. Randolph Babbitt,**  
Administrator.

[FR Doc. 2010-27629 Filed 11-1-10; 8:45 am]

**BILLING CODE 4910-13-P**

## DEPARTMENT OF TRANSPORTATION

### Federal Aviation Administration

#### 14 CFR Part 95

[Docket No. 30751; Amdt. No. 490]

#### IFR Altitudes; Miscellaneous Amendments

**AGENCY:** Federal Aviation Administration (FAA), DOT.

**ACTION:** Final rule.

**SUMMARY:** This amendment adopts miscellaneous amendments to the required IFR (instrument flight rules) altitudes and changeover points for certain Federal airways, jet routes, or direct routes for which a minimum or maximum en route authorized IFR altitude is prescribed. This regulatory action is needed because of changes occurring in the National Airspace System. These changes are designed to provide for the safe and efficient use of the navigable airspace under instrument conditions in the affected areas.

**DATES:** *Effective Date:* 0901 UTC, November 18, 2010.

#### FOR FURTHER INFORMATION CONTACT:

Harry Hodges, Flight Procedure Standards Branch (AMCAFS-420), Flight Technologies and Programs Division, Flight Standards Service, Federal Aviation Administration, Mike Monroney Aeronautical Center, 6500 South MacArthur Blvd., Oklahoma City, OK 73169 (Mail Address: P.O. Box 25082 Oklahoma City, OK 73125) telephone: (405) 954-4164.

**SUPPLEMENTARY INFORMATION:** This amendment to part 95 of the Federal Aviation Regulations (14 CFR part 95) amends, suspends, or revokes IFR altitudes governing the operation of all aircraft in flight over a specified route or any portion of that route, as well as the changeover points (COPs) for Federal airways, jet routes, or direct routes as prescribed in part 95.

#### The Rule

The specified IFR altitudes, when used in conjunction with the prescribed changeover points for those routes, ensure navigation aid coverage that is adequate for safe flight operations and free of frequency interference. The reasons and circumstances that create the need for this amendment involve matters of flight safety and operational efficiency in the National Airspace System, are related to published

aeronautical charts that are essential to the user, and provide for the safe and efficient use of the navigable airspace. In addition, those various reasons or circumstances require making this amendment effective before the next scheduled charting and publication date of the flight information to assure its timely availability to the user. The effective date of this amendment reflects those considerations. In view of the close and immediate relationship between these regulatory changes and safety in air commerce, I find that notice and public procedure before adopting this amendment are impracticable and contrary to the public interest and that good cause exists for making the amendment effective in less than 30 days.

#### Conclusion

The FAA has determined that this regulation only involves an established body of technical regulations for which frequent and routine amendments are necessary to keep them operationally current. It, therefore—(1) is not a “significant regulatory action” under Executive Order 12866; (2) is not a “significant rule” under DOT Regulatory Policies and Procedures (44 FR 11034; February 26, 1979); and (3) does not warrant preparation of a regulatory evaluation as the anticipated impact is so minimal. For the same reason, the FAA certifies that this amendment will not have a significant economic impact on a substantial number of small entities under the criteria of the Regulatory Flexibility Act.

#### List of Subjects in 14 CFR Part 95

Airspace, Navigation (air).

Issued in Washington, DC, on October 22, 2010.

**John M. Allen,**

*Director, Flight Standards Service.*

#### Adoption of the Amendment

■ Accordingly, pursuant to the authority delegated to me by the Administrator, part 95 of the Federal Aviation Regulations (14 CFR part 95) is amended as follows effective at 0901 UTC, November 18, 2010.

■ 1. The authority citation for part 95 continues to read as follows:

**Authority:** 49 U.S.C. 106(g), 40103, 40106, 40113, 40114, 40120, 44502, 44514, 44719, 44721.

■ 2. Part 95 is amended to read as follows: