Tabela de diferenças entre emendas e justificativas Emenda 139 para 140

25.21		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item g) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão vai requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. O item g(5)-I foi adicionado pela ANAC em comparação ao 14CFR 25.21 para manter a restrição já existente na emenda 135 ao uso de diferentes limites de carregamentos, peso e centro de gravidade para voo em condições de formação de gelo, exceto onde os requisitos aplicáveis de desempenho imponham limites mais restritivos. Este item visa garantir que a operação em condições de formação de gelo seja essencialmente transparente para a tripulação, sem a exigência de procedimentos ou métodos especiais para operação em condições de formação de gelo além da ativação dos sistemas de proteção contra gelo. A manutenção dessa restrição na emenda 140 é, portanto, essencial para a redução da complexidade operacional e da carga de trabalho da tripulação de voo. Ademais, constata-se que a EASA manteve o respectivo texto na emenda 16 do CS-25 e, conforme consulta ao FAA, constatou-se que já existe a intenção de restabelecer as prescrições suprimidas na edição da emenda 140.
§ 25.21 Proof of compliance. ... (g) The requirements of this subpart associated with icing conditions apply only if the applicant is seeking certification for flight in icing conditions. (1) Each requirement of this subpart, except paragraphs §§25.121(a), 25.123(c), 25.143(b)(1) and (b)(2), section 25.149, paragraph 25.201(c)(2), 25.207(c) and (d), section 25.239, and paragraphs 25.251(b) through (e), must be met in icing conditions. Paragraphs 25.207(c) and (d) must be met in the landing configuration in icing conditions, but need not be met for other configurations. Compliance must be shown using the ice accretions defined in appendix C of this RBAC, assuming normal operation of the airplane and its ice protection system in accordance with the operating limitations and operating procedures established by the applicant and provided in the Airplane Flight Manual. (2) No changes in the load distribution limits of section §25.23, the weight limits of section §25.25 (except where limited by performance requirements of this subpart), and the center of gravity	**§ 25.21 Proof of compliance.** … (g) The requirements of this subpart associated with icing conditions apply only if the applicant is seeking certification for flight in icing conditions. (1) Paragraphs (g)(3) and (4) of this section apply only to airplanes with one or both of the following attributes: (i) Maximum takeoff gross weight is less than 60,000 lbs; or (ii) The airplane is equipped with reversible flight controls. (2) Each requirement of this subpart, except §§25.121(a), 25.123(c), 25.143(b)(1) and (2), 25.149, 25.201(c)(2), 25.239, and 25.251(b) through (e), must be met in the icing conditions specified in Appendix C of this part. Section 25.207(c) and (d) must be met in the landing configuration in the icing conditions specified in Appendix C, but need not be met for other configurations. Compliance must be shown using the ice accretions defined in part II of Appendix C of this part, assuming normal operation of the airplane and its ice protection system in accordance with the operating limitations and operating	

limits of section §25.27, from those for non-icing conditions, are allowed for flight in icing conditions or with ice accretion.	procedures established by the applicant and provided in the airplane flight manual. (3) If the applicant does not seek certification for flight in all icing conditions defined in Appendix O of this part, each requirement of this subpart, except §§25.105, 25.107, 25.109, 25.111, 25.113, 25.115, 25.121, 25.123, 25.143(b)(1), (b)(2), and (c)(1), 25.149, 25.201(c)(2), 25.207(c), (d), and (e)(1), 25.239, and 25.251(b) through (e), must be met in the Appendix O icing conditions for which certification is not sought in order to allow a safe exit from those conditions. Compliance must be shown using the ice accretions defined in part II, paragraphs (b) and (d) of Appendix O, assuming normal operation of the airplane and its ice protection system in accordance with the operating limitations and operating procedures established by the applicant and provided in the airplane flight manual. (4) If the applicant seeks certification for flight in any portion of the icing conditions of Appendix O of this part, each requirement of this subpart, except §§25.121(a), 25.123(c), 25.143(b)(1) and (2), 25.149, 25.201(c)(2), 25.239, and 25.251(b) through (e), must be	

	met in the Appendix O icing conditions for which certification is sought. Section 25.207(c) and (d) must be met in the landing configuration in the Appendix O icing conditions for which certification is sought, but need not be met for other configurations. Compliance must be shown using the ice accretions defined in part II, paragraphs (c) and (d) of Appendix O, assuming normal operation of the airplane and its ice protection system in accordance with the operating limitations and operating procedures established by the applicant and provided in the airplane flight manual. (5)-I No changes in the load distribution limits of section §25.23, the weight limits of section §25.25 (except where limited by performance requirements of this subpart), and the center of gravity limits of section §25.27, from those for non-icing conditions, are allowed for flight in icing conditions or with ice accretion.	

25.105		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item a(2) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo
§ 25.105 Takeoff. (a) The takeoff speeds prescribed by §25.107, the accelerate-stop distance prescribed by §25.109, the	**§ 25.105 Takeoff.** (a) The takeoff speeds prescribed by §25.107, the accelerate-stop distance	

takeoff path prescribed by §25.111, the takeoff distance and takeoff run prescribed by §25.113, and the net takeoff flight path prescribed by §25.115, must be determined in the selected configuration for takeoff at each weight, altitude, and ambient temperature within the operational limits selected by the applicant— … (2) In icing conditions, if in the configuration of §25.121(b) with the takeoff ice accretion defined in appendix C: (i) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (ii) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). … [Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25–92, 63 FR 8318, Feb. 18, 1998; Amdt. 25–121, 72 FR 44665, Aug. 8, 2007]	prescribed by §25.109, the takeoff path prescribed by §25.111, the takeoff distance and takeoff run prescribed by §25.113, and the net takeoff flight path prescribed by §25.115, must be determined in the selected configuration for takeoff at each weight, altitude, and ambient temperature within the operational limits selected by the applicant— … (2) In icing conditions, if in the configuration used to show compliance with §25.121(b), and with the most critical of the takeoff ice accretion(s) defined in appendices C and O of this part, as applicable, in accordance with §25.21(g): (i) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (ii) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). …	causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

25.111		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item c(5) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*).
§ 25.111 Takeoff path. … (c) During the takeoff path determination in accordance with	**25.111 Takeoff path.** … (c) During the takeoff path determination in accordance with	

paragraphs (a) and (b) of this section— … (5) If §25.105(a)(2) requires the takeoff path to be determined for flight in icing conditions, the airborne part of the takeoff must be based on the airplane drag: (i) With the takeoff ice accretion defined in appendix C, from a height of 35 feet above the takeoff surface up to the point where the airplane is 400 feet above the takeoff surface; and (ii) With the final takeoff ice accretion defined in appendix C, from the point where the airplane is 400 feet above the takeoff surface to the end of the takeoff path. …	paragraphs (a) and (b) of this section— … (5) If §25.105(a)(2) requires the takeoff path to be determined for flight in icing conditions, the airborne part of the takeoff must be based on the airplane drag: (i) With the most critical of the takeoff ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), from a height of 35 feet above the takeoff surface up to the point where the airplane is 400 feet above the takeoff surface; and (ii) With the most critical of the final takeoff ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), from the point where the airplane is 400 feet above the takeoff surface to the end of the takeoff path. …	A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

25.119		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item b) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e
§ 25.119 Landing climb: All-engines-operating. In the landing configuration, the steady gradient of climb may not be less than 3.2 percent, with the engines at the power or thrust that is available 8 seconds after	**25.119 Landing climb: All-engines-operating.** In the landing configuration, the steady gradient of climb may not be less than 3.2 percent, with the engines at the power or thrust that is available 8 seconds after	

initiation of movement of the power or thrust controls from the minimum flight idle to the go-around power or thrust setting— … (b) In icing conditions with the landing ice accretion defined in appendix C, and with a climb speed of VREFdetermined in accordance with §25.125(b)(2)(ii).	initiation of movement of the power or thrust controls from the minimum flight idle to the go-around power or thrust setting— … (b) In icing conditions with the most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), and with a climb speed of VREF determined in accordance with §25.125(b)(2)(ii).	qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

25.121		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	Os itens b(2)(ii), c(2)(ii) e d(2)(ii) foram revisados para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.
§ 25.121 Climb: One-engine-inoperative. … (b) Takeoff; landing gear retracted. In the takeoff configuration existing at the point of the flight path at which the landing gear is fully retracted, and in the configuration used in §25.111 but without ground effect: … (2) The requirements of paragraph (b)(1) of this section must be met: … (ii) In icing conditions with the takeoff ice accretion defined in appendix C, if in the configuration of §25.121(b) with the takeoff ice accretion:	**25.121 Climb: One-engine-inoperative.** … (b) Takeoff; landing gear retracted. In the takeoff configuration existing at the point of the flight path at which the landing gear is fully retracted, and in the configuration used in §25.111 but without ground effect: … (2) The requirements of paragraph (b)(1) of this section must be met: … (ii) In icing conditions with the most critical of the takeoff ice accretion(s) defined in Appendices C and O of this part,	

(A) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (B) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). (c) Final takeoff. In the en route configuration at the end of the takeoff path determined in accordance with §25.111: … (2) The requirements of paragraph (c)(1) of this section must be met: … (ii) In icing conditions with the final takeoff ice accretion defined in appendix C, if in the configuration of §25.121(b) with the takeoff ice accretion: (A) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (B) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). (d) Approach. In a configuration corresponding to the normal all-engines-operating procedure in	as applicable, in accordance with §25.21(g), if in the configuration used to show compliance with §25.121(b) with this takeoff ice accretion: (A) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (B) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). (c) Final takeoff. In the en route configuration at the end of the takeoff path determined in accordance with §25.111: … (2) The requirements of paragraph (c)(1) of this section must be met: … (ii) In icing conditions with the most critical of the final takeoff ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), if in the configuration used to show compliance with §25.121(b) with the takeoff ice accretion used to show compliance with §25.111(c)(5)(i):	

which VSRfor this configuration does not exceed 110 percent of the VSRfor the related all-engines-operating landing configuration: … (2) The requirements of paragraph (d)(1) of this section must be met: … (ii) In icing conditions with the approach ice accretion defined in appendix C. The climb speed selected for non-icing conditions may be used if the climb speed for icing conditions, computed in accordance with paragraph (d)(1)(iii) of this section, does not exceed that for non-icing conditions by more than the greater of 3 knots CAS or 3 percent.	(A) The stall speed at maximum takeoff weight exceeds that in non-icing conditions by more than the greater of 3 knots CAS or 3 percent of VSR; or (B) The degradation of the gradient of climb determined in accordance with §25.121(b) is greater than one-half of the applicable actual-to-net takeoff flight path gradient reduction defined in §25.115(b). (d) Approach. In a configuration corresponding to the normal all-engines-operating procedure in which VSR for this configuration does not exceed 110 percent of the VSR for the related all-engines-operating landing configuration: … (2) The requirements of paragraph (d)(1) of this section must be met: … (ii) In icing conditions with the most critical of the approach ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g). The climb speed selected for non-icing conditions may be used if the climb speed for icing conditions, computed in accordance with paragraph (d)(1)(iii) of this section, does not exceed that for non-icing conditions by more than the	

	greater of 3 knots CAS or 3 percent.	

25.123		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item b(2) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.
§ 25.123 En route flight paths. … (b) The one-engine-inoperative net flight path data must represent the actual climb performance diminished by a gradient of climb of 1.1 percent for two-engine airplanes, 1.4 percent for three-engine airplanes, and 1.6 percent for four-engine airplanes— … (2) In icing conditions with the en route ice accretion defined in appendix C, if: …	**25.123 En route flight paths.** … (b) The one-engine-inoperative net flight path data must represent the actual climb performance diminished by a gradient of climb of 1.1 percent for two-engine airplanes, 1.4 percent for three-engine airplanes, and 1.6 percent for four-engine airplanes— … (2) In icing conditions with the most critical of the en route ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), if: …	

25.125		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	Os itens a(2), b(2)(ii)(B) e b(2)(ii)(C) foram revisados para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva
§ 25.125 Landing. (a) The horizontal distance necessary to land and to come to a complete stop (or to a speed of approximately 3 knots for water landings) from a point 50 feet above the landing surface must be determined (for standard temperatures, at each weight, altitude, and wind within the	**25.125 Landing.** (a) The horizontal distance necessary to land and to come to a complete stop (or to a speed of approximately 3 knots for water landings) from a point 50 feet above the landing surface must be determined (for standard temperatures, at each weight, altitude, and wind within the	

operational limits established by the applicant for the airplane): … (2) In icing conditions with the landing ice accretion defined in appendix C if VREF for icing conditions exceeds VREF for non-icing conditions by more than 5 knots CAS at the maximum landing weight. (b) In determining the distance in paragraph (a) of this section: … (2) A stabilized approach, with a calibrated airspeed of not less than VREF, must be maintained down to the 50-foot height. .. (ii) In icing conditions, VREF may not be less than: … (B) 1.23 VSR0with the landing ice accretion defined in appendix C if that speed exceeds VREF for non-icing conditions by more than 5 knots CAS; and (C) A speed that provides the maneuvering capability specified in §25.143(h) with the landing ice accretion defined in appendix C. …	operational limits established by the applicant for the airplane): … (2) In icing conditions with the most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), if VREF for icing conditions exceeds VREF for non-icing conditions by more than 5 knots CAS at the maximum landing weight. … (b) In determining the distance in paragraph (a) of this section: … (2) A stabilized approach, with a calibrated airspeed of not less than VREF, must be maintained down to the 50-foot height. … (ii) In icing conditions, VREF may not be less than: … (B) 1.23 VSR0 with the most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), if that speed exceeds VREF selected for non-icing conditions by more than 5 knots CAS; and (C) A speed that provides the maneuvering capability specified in §25.143(h) with the most critical of the landing ice	congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

	accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g). …	

25.143		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	
§ 25.143 General. … (c) The airplane must be shown to be safely controllable and maneuverable with the critical ice accretion appropriate to the phase of flight defined in appendix C, and with the critical engine inoperative and its propeller (if applicable) in the minimum drag position: … (i) When demonstrating compliance with §25.143 in icing conditions— (1) Controllability must be demonstrated with the ice accretion defined in appendix C that is most critical for the particular flight phase; … (j) For flight in icing conditions before the ice protection system has been activated and is performing its intended function, it must be demonstrated in flight with the ice accretion defined in appendix C, part II(e) of this part that: …	**25.143 General.** ... (c) The airplane must be shown to be safely controllable and maneuverable with the most critical of the ice accretion(s) appropriate to the phase of flight as defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), and with the critical engine inoperative and its propeller (if applicable) in the minimum drag position: … (i) When demonstrating compliance with §25.143 in icing conditions— (1) Controllability must be demonstrated with the most critical of the ice accretion(s) for the particular flight phase as defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g); ... (j) For flight in icing conditions before the ice protection system has been activated and is performing its intended function, it must be demonstrated in flight with the most critical of the ice accretion(s) defined in Appendix C, part II, paragraph (e) of this part and Appendix O, part II, paragraph (d) of this part, as applicable, in accordance with §25.21(g), that: …	Os itens (c), (i)(1) e (j) foram revisados para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

25.207		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O itens b), e), e h) foram revisados para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.
§ 25.207 Stall warning. … (b) The warning must be furnished either through the inherent aerodynamic qualities of the airplane or by a device that will give clearly distinguishable indications under expected conditions of flight. However, a visual stall warning device that requires the attention of the crew within the cockpit is not acceptable by itself. If a warning device is used, it must provide a warning in each of the airplane configurations prescribed in paragraph (a) of this section at the speed prescribed in paragraphs (c) and (d) of this section. Except for showing compliance with the stall warning margin prescribed in paragraph (h)(3)(ii) of this section, stall warning for flight in icing conditions must be provided by the same means as stall warning for flight in non-icing conditions. … (e) In icing conditions, the stall warning margin in straight and turning flight must be sufficient to allow the pilot to prevent stalling (as defined in §25.201(d)) when the pilot starts a recovery maneuver not less than three seconds after the onset of stall warning. When	**25.207 Stall warning.** … (b) The warning must be furnished either through the inherent aerodynamic qualities of the airplane or by a device that will give clearly distinguishable indications under expected conditions of flight. However, a visual stall warning device that requires the attention of the crew within the cockpit is not acceptable by itself. If a warning device is used, it must provide a warning in each of the airplane configurations prescribed in paragraph (a) of this section at the speed prescribed in paragraphs (c) and (d) of this section. Except for the stall warning prescribed in paragraph (h)(3)(ii) of this section, the stall warning for flight in icing conditions must be provided by the same means as the stall warning for flight in non-icing conditions. … (e) In icing conditions, the stall warning margin in straight and turning flight must be sufficient to allow the pilot to prevent stalling (as defined in §25.201(d)) when the pilot starts a recovery maneuver not less	

demonstrating compliance with this paragraph, the pilot must perform the recovery maneuver in the same way as for the airplane in non-icing conditions. Compliance with this requirement must be demonstrated in flight with the speed reduced at rates not exceeding one knot per second, with— (1) The more critical of the takeoff ice and final takeoff ice accretions defined in appendix C for each configuration used in the takeoff phase of flight; (2) The en route ice accretion defined in appendix C for the en route configuration; (3) The holding ice accretion defined in appendix C for the holding configuration(s); (4) The approach ice accretion defined in appendix C for the approach configuration(s); and (5) The landing ice accretion defined in appendix C for the landing and go-around configuration(s). … (h) For flight in icing conditions before the ice protection system has been activated and is performing its intended function, with the ice accretion defined in appendix C, part II(e) of this part, the stall warning margin in straight and turning flight must be sufficient to allow the pilot to prevent stalling	than three seconds after the onset of stall warning. When demonstrating compliance with this paragraph, the pilot must perform the recovery maneuver in the same way as for the airplane in non-icing conditions. Compliance with this requirement must be demonstrated in flight with the speed reduced at rates not exceeding one knot per second, with— (1) The most critical of the takeoff ice and final takeoff ice accretions defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), for each configuration used in the takeoff phase of flight; (2) The most critical of the en route ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), for the en route configuration; (3) The most critical of the holding ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), for the holding configuration(s); (4) The most critical of the approach ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance	

without encountering any adverse flight characteristics when: …	with §25.21(g), for the approach configuration(s); and (5) The most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), for the landing and go-around configuration(s). … (h) The following stall warning margin is required for flight in icing conditions before the ice protection system has been activated and is performing its intended function. Compliance must be shown using the most critical of the ice accretion(s) defined in Appendix C, part II, paragraph (e) of this part and Appendix O, part II, paragraph (d) of this part, as applicable, in accordance with §25.21(g). The stall warning margin in straight and turning flight must be sufficient to allow the pilot to prevent stalling without encountering any adverse flight characteristics when: ...	

25.237		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item a(3)(ii) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais
§ 25.237 Wind velocities. (a) For land planes and amphibians, the following applies: …	**25.237 Wind velocities.** (a) For land planes and amphibians, the following applies: …	

(3) The landing crosswind component must be established for: .. (ii) Icing conditions with the landing ice accretion defined in appendix C. ...	(3) The landing crosswind component must be established for: … (ii) Icing conditions with the most critical of the landing ice accretion(s) defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g). …	afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho e qualidades de voo em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.

25.253		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item c) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop* - *SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda.
§ 25.253 High-speed characteristics. ... (c) Maximum speed for stability characteristics in icing conditions. The maximum speed for stability characteristics with the ice accretions defined in appendix C to this RBAC, at which the requirements of paragraphs 25.143(g), 25.147(f), 25.175(b)(1), 25.177(a) through (c), and 25.181 must be met, is the lower of:(1) 300 knots CAS; (2) VFC; or (3) A speed at which it is demonstrated that the airframe will be free of ice accretion due to the effects of increased dynamic pressure.	**25.253 High-speed characteristics.** ... (c) Maximum speed for stability characteristics in icing conditions. The maximum speed for stability characteristics with the most critical of the ice accretions defined in Appendices C and O of this part, as applicable, in accordance with §25.21(g), at which the requirements of §§25.143(g), 25.147(f), 25.175(b)(1), 25.177(a) through (c), and 25.181 must be met, is the lower of: (1) 300 knots CAS; (2) VFC; or (3) A speed at which it is demonstrated that the airframe will be free of ice accretion due to the effects of increased dynamic pressure.	

25.773		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item b(1)(ii) foi revisado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo cumpram com regulamentos de desempenho em um envelope expandido de formação de gelo que inclui chuvisco congelante e chuva congelante, definidos no novo apêndice O incluído nesta emenda.
§ 25.773 Pilot compartment view. ... (b) Precipitation conditions. For precipitation conditions, the following apply: (1) The airplane must have a means to maintain a clear portion of the windshield, during precipitation conditions, sufficient for both pilots to have a sufficiently extensive view along the flight path in normal flight attitudes of the airplane. This means must be designed to function, without continuous attention on the part of the crew, in— … (ii) The icing conditions specified in section 25.1419 of this RBAC if certification for flight in icing conditions is requested. ..	**25.773 Pilot compartment view.** ... b) Precipitation conditions. For precipitation conditions, the following apply: (1) The airplane must have a means to maintain a clear portion of the windshield, during precipitation conditions, sufficient for both pilots to have a sufficiently extensive view along the flight path in normal flight attitudes of the airplane. This means must be designed to function, without continuous attention on the part of the crew, in— … (ii) The icing conditions specified in Appendix C of this part and the following icing conditions specified in Appendix O of this part, if certification for flight in icing conditions is sought: (A) For airplanes certificated in accordance with §25.1420(a)(1), the icing conditions that the airplane is certified to safely exit following detection. (B) For airplanes certificated in accordance with §25.1420(a)(2), the icing conditions that the	

	airplane is certified to safely operate in and the icing conditions that the airplane is certified to safely exit following detection. (C) For airplanes certificated in accordance with §25.1420(a)(3) and for airplanes not subject to §25.1420, all icing conditions. ...	

25.903		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item 25.903(a)(3) foi incluído para melhorar a segurança de voo em condições de congelamento para aeronaves e motores certificados para a categoria transporte. O requisito irá abordar as condições de congelamento excessivo nas condições de fase mista e formação de cristais de gelo para todos os aviões da categoria de transporte. Além disso, o requisito irá abordar as condições de congelamento excessivo para as fases mista, formação de cristais de gelo e gotículas super-resfriadas para todos os motores turbojato, turbofan e turboélice. Esta revisão também visa a harmonizar o texto com a FAA e a EASA. Os itens b), c) d), e) e f) não sofreram revisão.
§ 25.903 Engines. (a) *Engine type certificate.* … (3) [NÃO EXISTENTE] …	**25.903 Engines.** (a) *Engine type certificate.* ... (3) Each turbine engine must comply with one of the following paragraphs: (i) Section 33.68 of this chapter in effect on January 5, 2015, or as subsequently amended; or (ii) Section 33.68 of this chapter in effect on February 23, 1984, or as subsequently amended before January 5, 2015, unless that engine's ice accumulation service history has resulted in an unsafe condition; or (iii) Section 33.68 of this chapter in effect on October 1, 1974, or as subsequently amended prior to February 23, 1984, unless that engine's ice accumulation service history has resulted in an unsafe condition; or (iv) Be shown to have an ice accumulation service history in	

	similar installation locations which has not resulted in any unsafe conditions.	

25.929		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item a) foi revisado para melhorar a segurança de voo em condições de congelamento para aeronaves e motores certificados para a categoria transporte. O requisito irá abordar as condições de congelamento excessivo nas condições de fase mista e formação de cristais de gelo para todos os aviões da categoria de transporte. Além disso, o requisito irá abordar as condições de congelamento excessivo para as fases mista, formação de cristais de gelo e gotículas super-resfriadas para todos os motores turbojato, turbofan e turboélice. Esta revisão também visa a harmonizar o texto com a FAA e a EASA. O item b) não sofreu revisão.
§ 25.929 Propeller deicing. (a) For airplanes intended for use where icing may be expected, there must be a means to prevent or remove hazardous ice accumulation on propellers or on accessories where ice accumulation would jeopardize engine performance. ...	**25.929 Propeller deicing.** (a) If certification for flight in icing is sought there must be a means to prevent or remove hazardous ice accumulations that could form in the icing conditions defined in Appendix C of this part and in the portions of Appendix O of this part for which the airplane is approved for flight on propellers or on accessories where ice accumulation would jeopardize engine performance. … [Doc. No. 5066, 29 FR 18291, Dec. 24, 1964, as amended by Amdt. 25-140, 79 FR 65525, Nov. 4, 2014]	

25.1093		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item b) foi revisado para melhorar a segurança de voo em condições de congelamento para aeronaves e motores certificados para a categoria transporte. O requisito irá abordar as condições de congelamento excessivo nas
§ 25.1093 Induction system icing protection. ... (b) *Turbine engines.* (1) Each turbine engine must operate throughout the flight power range	**25.1093 Induction system icing protection.** ... (b) Turbine engines. Except as provided in paragraph (b)(3) of this section, each engine, with all icing protection systems operating, must:	

of the engine (including idling), without the accumulation of ice on the engine, inlet system components, or airframe components that would adversely affect engine operation or cause a serious loss of power or thrust— (i) Under the icing conditions specified in appendix C, and (ii) In falling and blowing snow within the limitations established for the airplane for such operation. (2) Each turbine engine must idle for 30 minutes on the ground, with the air bleed available for engine icing protection at its critical condition, without adverse effect, in an atmosphere that is at a temperature between 15° and 30 °F (between −9° and −1 °C) and has a liquid water content not less than 0.3 grams per cubic meter in the form of drops having a mean effective diameter not less than 20 microns, followed by momentary operation at takeoff power or thrust. During the 30 minutes of idle operation, the engine may be run up periodically to a moderate power or thrust setting in a manner acceptable to the Administrator. ...	(1) Operate throughout its flight power range, including the minimum descent idling speeds, in the icing conditions defined in Appendices C and O of this part, and Appendix D of part 33 of this chapter, and in falling and blowing snow within the limitations established for the airplane for such operation, without the accumulation of ice on the engine, inlet system components, or airframe components that would do any of the following: (i) Adversely affect installed engine operation or cause a sustained loss of power or thrust; or an unacceptable increase in gas path operating temperature; or an airframe/engine incompatibility; or (ii) Result in unacceptable temporary power loss or engine damage; or (iii) Cause a stall, surge, or flameout or loss of engine controllability (for example, rollback). (2) Operate at ground idle speed for a minimum of 30 minutes on the ground in the following icing conditions shown in Table 1 of this section, unless replaced by similar test conditions that are more critical. These conditions must be demonstrated with the available air bleed for icing protection at its critical condition, without adverse effect, followed by an acceleration to takeoff power or thrust in accordance with the procedures defined in the airplane flight manual. During the idle operation, the engine may be run up periodically to a moderate power or thrust setting in a manner acceptable to the Administrator. Analysis may be used to show ambient temperatures below the tested temperature are less critical. The applicant must document the engine run-up procedure (including the maximum time interval between run-ups from idle, run-up power setting, and duration at power), the associated minimum ambient temperature, and the maximum time interval. These conditions must be	condições de fase mista e formação de cristais de gelo para todos os aviões da categoria de transporte. Além disso, o requisito irá abordar as condições de congelamento excessivo para as fases mista, formação de cristais de gelo e gotículas super-resfriadas para todos os motores turbojato, turbofan e turboélice. Esta revisão também visa a harmonizar o texto com a FAA e a EASA. O iten a) e c) não sofreram revisão.

<table>
<tr>
<td></td>
<td>used in the analysis that establishes the airplane operating limitations in accordance with §25.1521.
(3) For the purposes of this section, the icing conditions defined in appendix O of this part, including the conditions specified in Condition 3 of Table 1 of this section, are not applicable to airplanes with a maximum takeoff weight equal to or greater than 60,000 pounds.
Table 1—Icing Conditions for Ground Tests
<table>
<tr><th>Condition</th><th>Total air temperature</th><th>Water concentration (minimum)</th><th>Mean effective particle diameter</th><th>Demonstration</th></tr>
<tr><td>1. Rime ice condition</td><td>0 to 15 °F (18 to −9 °C)</td><td>Liquid—0.3 g/m3</td><td>15-25 microns</td><td>By test, analysis or combination of the two.</td></tr>
<tr><td>2. Glaze ice condition</td><td>20 to 30 °F (−7 to −1 °C)</td><td>Liquid—0.3 g/m3</td><td>15-25 microns</td><td>By test, analysis or combination of the two.</td></tr>
<tr><td>3. Large drop condition</td><td>15 to 30 °F (−9 to −1 °C)</td><td>Liquid—0.3 g/m3</td><td>100 microns (minimum)</td><td>By test, analysis or combination of the two.</td></tr>
</table>
...</td>
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<table>
<tr><th>25.1323</th><th></th><th>Justificativa</th></tr>
<tr><td>RBAC Emenda 25-139</td><td>RBAC 25 Emenda 25-140</td><td rowspan="2">O item (i) foi revisado devido às recomendações da Assessoria em Regulação de Aviação (ARAC), que propôs o seguinte:
• Definir um ambiente de gelo que inclui condições SLD (Supercooled Large Drop).
• Considerar a necessidade de definir uma fase mista combinando ambiente de congelamento (líquido super-resfriado
E cristais de gelo).</td></tr>
<tr><td>§ 25.1323 Airspeed indicating system.
...
(i) Each system must have a heated pitot tube or an equivalent means of preventing malfunction due to icing.
...</td><td>25.1323 Airspeed indicating system.
...
(i) Each system must have a heated pitot tube or an equivalent means of preventing malfunction in the heavy rain conditions defined in Table 1 of this section; mixed phase and ice crystal conditions as defined in part 33, Appendix D, of this chapter; the icing conditions defined in Appendix C of this part; and the following icing conditions specified in Appendix O of this part:</td></tr>
</table>

<table>
<tr>
<td></td>
<td>(1) For airplanes certificated in accordance with §25.1420(a)(1), the icing conditions that the airplane is certified to safely exit following detection.
(2) For airplanes certificated in accordance with §25.1420(a)(2), the icing conditions that the airplane is certified to safely operate in and the icing conditions that the airplane is certified to safely exit following detection.
(3) For airplanes certificated in accordance with §25.1420(a)(3) and for airplanes not subject to §25.1420, all icing conditions.

TABLE 1—HEAVY RAIN CONDITIONS FOR AIRSPEED INDICATING SYSTEM TESTS
<table>
<tr><th colspan="2">Altitude range</th><th>Liquid water content</th><th colspan="2">Horizontal extent</th><th>Droplet MVD</th></tr>
<tr><th>(ft)</th><th>(m)</th><th>(g/m3)</th><th>(km)</th><th>(nmiles)</th><th>(µm)</th></tr>
<tr><td>0 to 10 000</td><td>0 to 3000</td><td>1</td><td>100</td><td>50</td><td>1000</td></tr>
<tr><td></td><td></td><td>6</td><td>5</td><td>3</td><td>2000</td></tr>
<tr><td></td><td></td><td>15</td><td>1</td><td>0.5</td><td>2000</td></tr>
</table>
...</td>
<td>O objetivo foi elaborar requisitos para determinar a capacidade de um avião de operar com segurança e sem restrições em condições SLD e na condição de fase mista com segurança até que possa sair dessas condições, estabelecendo um novo nível de segurança para as aeronaves de categoria transporte (RBAC 25).
Federal Aviation Administration (FAA) determinou estas alterações neste e em outros parágrafos da Parte 25, para atender a essas condições de voo. A atualização proposta pela ANAC, portanto, também visa a harmonizar o RBAC 25 com as regras internacionais de projeto para aeronaves categoria transporte.</td>
</tr>
</table>

25.1324		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	Com base nas recomendações da Assessoria em Regulação de Aviação (ARAC), a Federal Aviation Administration (FAA) emitiu um *Notice of Proposed Rulemaking* (NPRM) intitulado "Airplane and Engine Certification Requirements in Supercooled Large Drop, Mixed Phase, and Ice Crystal Icing Conditions"
Seção inexistente.	**25.1324 Angle of attack system.** Each angle of attack system sensor must be heated or have an equivalent means of preventing malfunction in the heavy rain conditions defined in Table 1 of §25.1323, the mixed phase and ice crystal conditions as defined in part 33, Appendix D, of this chapter, the icing conditions defined in Appendix C of this part, and the following icing conditions specified in Appendix O of this part:	

	(a) For airplanes certificated in accordance with §25.1420(a)(1), the icing conditions that the airplane is certified to safely exit following detection. (b) For airplanes certificated in accordance with §25.1420(a)(2), the icing conditions that the airplane is certified to safely operate in and the icing conditions that the airplane is certified to safely exit following detection. (c) For airplanes certificated in accordance with §25.1420(a)(3) and for airplanes not subject to §25.1420, all icing conditions.	Neste NPRM, a FAA propôs especificamente criar os seguintes novos regulamentos: §25.1324 Sistemas de ângulo de ataque; §25.1420 condições de formação de gelo SLD; parte 25, apêndice O (condições de gelo SLD); além do parte 33, apêndice D. O novo regulamento visa a proteger os sensores do sistema de ângulo de ataque em relação a condições mais severas de formação de gelo encontradas pelas aeronaves categoria transporte, estabelecendo um nível de segurança maior. A atualização feita pela ANAC também harmoniza o regulamento com as regras internacionais.

25.1325		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item (b) foi alterado para detalhar as novas condições de aprovação do sensor de pressão estática. A alteração é para atender as modificações feitas nos requisitos que definem as novas condições de operação em ambiente de formação de gelo, estabelecendo um nível maior de segurança. A Federal Aviation Administration (FAA) determinou estas alterações neste e em outros parágrafos da Parte 25, para atender a essas condições de voo. A atualização proposta pela ANAC, portanto, também visa a harmonizar o RBAC 25 com as regras internacionais de projeto para aeronaves categoria transporte.
§ 25.1325 Static pressure systems. ... (b) Each static port must be designed and located in such manner that the static pressure system performance is least affected by airflow variation, or by moisture or other foreign matter, and that the correlation between air pressure in the static pressure system and true ambient atmospheric static pressure is not changed when the airplane is exposed to the continuous and intermittent maximum icing conditions defined in appendix C of this part. ...	**25.1325 Static pressure systems.** ... (b) Each static port must be designed and located so that: (1) The static pressure system performance is least affected by airflow variation, or by moisture or other foreign matter; and (2) The correlation between air pressure in the static pressure system and true ambient atmospheric static pressure is not changed when the airplane is exposed to the icing conditions defined in Appendix C of this part, and the following icing conditions specified in Appendix O of this part: (i) For airplanes certificated in accordance with §25.1420(a)(1), the icing conditions that the airplane is certified to safely exit following detection.	

	(ii) For airplanes certificated in accordance with §25.1420(a)(2), the icing conditions that the airplane is certified to safely operate in and the icing conditions that the airplane is certified to safely exit following detection. (iii) For airplanes certificated in accordance with §25.1420(a)(3) and for airplanes not subject to §25.1420, all icing conditions. ...	

25.1420		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O requisito é novo, e visa melhorar o nível de segurança dos aviões categoria transporte mais suscetíveis às gotas grandes super-resfriadas (SLD).
Não existente.	**25.1420 Supercooled large drop icing conditions.** (a) If certification for flight in icing conditions is sought, in addition to the requirements of § 25.1419, an airplane with a maximum takeoff weight less than 60,000 pounds or with reversible flight controls must be capable of operating in accordance with paragraphs (a)(1), (2), or (3), of this section. (1) Operating safely after encountering the icing conditions defined in Appendix O of this part: (i) The airplane must have a means to detect that it is operating in Appendix O icing conditions; and (ii) Following detection of Appendix O icing conditions, the airplane must be capable of	

	operating safely while exiting all icing conditions. (2) Operating safely in a portion of the icing conditions defined in Appendix O of this part as selected by the applicant: (i) The airplane must have a means to detect that it is operating in conditions that exceed the selected portion of Appendix O icing conditions; and (ii) Following detection, the airplane must be capable of operating safely while exiting all icing conditions. (3) Operating safely in the icing conditions defined in Appendix O of this part. (b) To establish that the airplane can operate safely as required in paragraph (a) of this section, an applicant must show through analysis that the ice protection for the various components of the airplane is adequate, taking into account the various airplane operational configurations. To verify the analysis, one, or more as found necessary, of the following methods must be used: (1) Laboratory dry air or simulated icing tests, or a combination of both, of the components or models of the components. (2) Laboratory dry air or simulated icing tests, or a	

	combination of both, of models of the airplane. (3) Flight tests of the airplane or its components in simulated icing conditions, measured as necessary to support the analysis. (4) Flight tests of the airplane with simulated ice shapes. (5) Flight tests of the airplane in natural icing conditions, measured as necessary to support the analysis. (c) For an airplane certified in accordance with paragraph (a)(2) or (3) of this section, the requirements of § 25.1419(e), (f), (g), and (h) must be met for the icing conditions defined in Appendix O of this part in which the airplane is certified to operate. (d) For the purposes of this section, the following definitions apply: (1) Reversible Flight Controls. Flight controls in the normal operating configuration that have force or motion originating at the airplane's control surface (for example, through aerodynamic loads, static imbalance, or trim or servo tab inputs) that is transmitted back to flight deck controls. This term refers to flight deck controls connected to the pitch, roll, or yaw control surfaces by direct mechanical linkages, cables, or push-pull rods in such a way that pilot effort produces	

	motion or force about the hinge line. (2) Simulated Icing Test. Testing conducted in simulated icing conditions, such as in an icing tunnel or behind an icing tanker. (3) Simulated Ice Shape. Ice shape fabricated from wood, epoxy, or other materials by any construction technique.	

25.1521		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item c) (3) foi alterado e adicionado novo texto enquanto o item c) (4) é o mesmo item c) (3) da versão anterior. Esta revisão busca melhorar a segurança de voo em condições de congelamento para aeronaves e motores certificados para a categoria transporte. O requisito irá abordar as condições de congelamento excessivo nas condições de fase mista e formação de cristais de gelo para todos os aviões da categoria de transporte. Além disso, o requisito irá abordar as condições de congelamento excessivo para as fases mista, formação de cristais de gelo e gotículas super-resfriadas para todos os motores turbojato, turbofan e turboélice. Esta revisão também visa a harmonizar o texto com a FAA e a EASA.
§ 25.1521 Powerplant limitations. …. (c) *Turbine engine installations.* ... (3) Any other parameter for which a limitation has been established as part of the engine type certificate except that a limitation need not be established for a parameter that cannot be exceeded during normal operation due to the design of the installation or to another established limitation. (4) [SEÇÃO INEXISTENTE] ...	**25.1521 Powerplant limitations.** .... (c) *Turbine engine installations*. ... (3) Maximum time interval between engine run-ups from idle, run-up power setting and duration at power for ground operation in icing conditions, as defined in §25.1093(b)(2). (4) Any other parameter for which a limitation has been established as part of the engine type certificate except that a limitation need not be established for a parameter that cannot be exceeded during normal operation due to the design of the installation or to another established limitation. ...	

25.1533		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O item c) foi adicionado para aumentar o nível de segurança de voo das aeronaves de categoria transporte durante operação em condição de formação de gelo causada por gotas grandes super-resfriadas (*supercooled large drop - SLD*). A revisão via requerer que as aeronaves mais afetadas por essas condições de formação de gelo sejam proibidas de voar intencionalmente em condições de formação de gelo SLD para as quais o avião não foi certificado e que saiam imediatamente de tais condições se estas forem encontradas em voo. Os demais itens não sofreram revisão, tendo sido apenas traduzidos.
§ 25.1533 Additional operating limitations. ... (c) [SEÇÃO INEXISTENTE]	**25.1533 Additional operating limitations.** ... (c) For airplanes certified in accordance with §25.1420(a)(1) or (2), an operating limitation must be established to: (1) Prohibit intentional flight, including takeoff and landing, into icing conditions defined in Appendix O of this part for which the airplane has not been certified to safely operate; and (2) Require exiting all icing conditions if icing conditions defined in Appendix O of this part are encountered for which the airplane has not been certified to safely operate.	

Apêndice C ao RBAC 25		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O regulamento foi alterado de forma a substituir "ponto/momento em que o avião deixa o solo" (*liftoff*) por "final da distância de decolagem". Esta alteração não tem relação com SLD, visando apenas melhor alinhar a definição do gelo de decolagem com a da pista de decolagem utilizada para determinar a performance de decolagem nos termos dos §§ 25.111, 25.113, e 25.115.
Part II—Airframe Ice Accretions for Showing Compliance With Subpart B. (a) (1) *Takeoff ice* is the most critical ice accretion on unprotected surfaces and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, occurring between	*Part II—Airframe Ice Accretions for Showing Compliance With Subpart B.* (a) (1) *Takeoff ice* is the most critical ice accretion on unprotected surfaces and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, occurring between the end of the takeoff distance and 400	

liftoff and 400 feet above the takeoff surface, assuming accretion starts at liftoff in the takeoff maximum icing conditions of part I, paragraph (c) of this appendix. (2) ... Ice accretion is assumed to start at liftoff in the takeoff maximum icing conditions of part I, paragraph (c) of this appendix. (d) (2) The ice accretion starts at liftoff;	feet above the takeoff surface, assuming accretion starts at the end of the takeoff distance in the takeoff maximum icing conditions defined in part I of this Appendix. (2) *Final takeoff ice* is the most critical ice accretion on unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, between 400 feet and either 1,500 feet above the takeoff surface, or the height at which the transition from the takeoff to the en route configuration is completed and $V_{FTO}$is reached, whichever is higher. Ice accretion is assumed to start at the end of the takeoff distance in the takeoff maximum icing conditions of part I, paragraph (c) of this Appendix. (d) (2) The ice accretion starts at the end of the takeoff distance.	

Apêndice O ao RBAC 25		Justificativa
RBAC Emenda 25-139	**RBAC 25 Emenda 25-140**	O apêndice O é completamente novo e é referenciado em diversos regulamentos que foram alterados na emenda 140. De forma similar ao apêndice C, o apêndice O é composto de duas partes. A primeira define as condições atmosféricas de chuva e chuvisco congelantes e a segunda define as formas de gelo para cada fase de voo a serem consideradas no projeto dos aviões categoria transporte.
Seção inexistente	**Appendix O to Part 25—Supercooled Large Drop Icing Conditions** This Appendix consists of two parts. Part I defines this Appendix as a description of supercooled large drop icing conditions in which the drop median volume diameter (MVD) is less than or greater than 40 µm, the	

maximum mean effective drop diameter (MED) of Appendix C of this part continuous maximum (stratiform clouds) icing conditions. For this Appendix, supercooled large drop icing conditions consist of freezing drizzle and freezing rain occurring in and/or below stratiform clouds. Part II defines ice accretions used to show compliance with the airplane performance and handling qualities requirements of subpart B of this part.

PART I—METEOROLOGY

In this Appendix icing conditions are defined by the parameters of altitude, vertical and horizontal extent, temperature, liquid water content, and water mass distribution as a function of drop diameter distribution.

(a) Freezing Drizzle (Conditions with spectra maximum drop diameters from 100µm to 500 µm):

(1) Pressure altitude range: 0 to 22,000 feet MSL.

(2) Maximum vertical extent: 12,000 feet.

(3) Horizontal extent: Standard distance of 17.4 nautical miles.

(4) Total liquid water content.

Note: Liquid water content (LWC) in grams per cubic meter (g/m3) based on horizontal extent standard distance of 17.4 nautical miles.

(5) Drop diameter distribution: Figure 2.

(6) Altitude and temperature envelope: Figure 3.

(b) Freezing Rain (Conditions with spectra maximum drop diameters greater than 500 µm):

(1) Pressure altitude range: 0 to 12,000 ft MSL.

(2) Maximum vertical extent: 7,000 ft.

(3) Horizontal extent: Standard distance of 17.4 nautical miles.

(4) Total liquid water content.

Note: LWC in grams per cubic meter (g/m3) based on horizontal extent standard distance of 17.4 nautical miles.

(5) Drop Diameter Distribution: Figure 5.

(6) Altitude and temperature envelope: Figure 6.

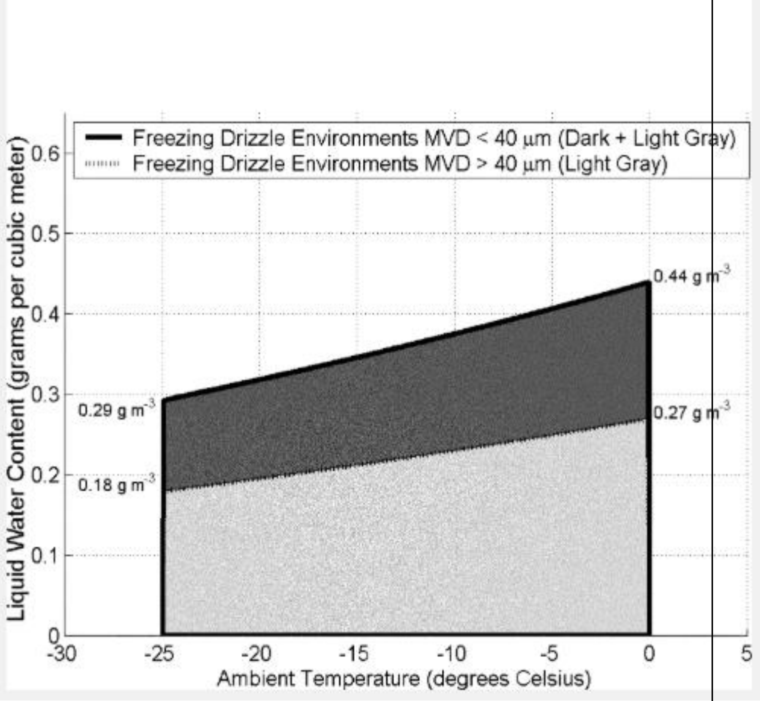
	(c) Horizontal extent. The liquid water content for freezing drizzle and freezing rain conditions for horizontal extents other than the standard 17.4 nautical miles can be determined by the value of the liquid water content determined from Figure 1 or Figure 4, multiplied by the factor provided in Figure 7, which is defined by the following equation: $S = 1.266 - 0.213 \log10(H)$ Where: S = Liquid Water Content Scale Factor (dimensionless) and H = horizontal extent in nautical miles FIGURE 1 — Appendix O, Freezing Drizzle, Liquid Water Content 	

FIGURE 2 — Appendix O, Freezing Drizzle, Drop Diameter Distribution

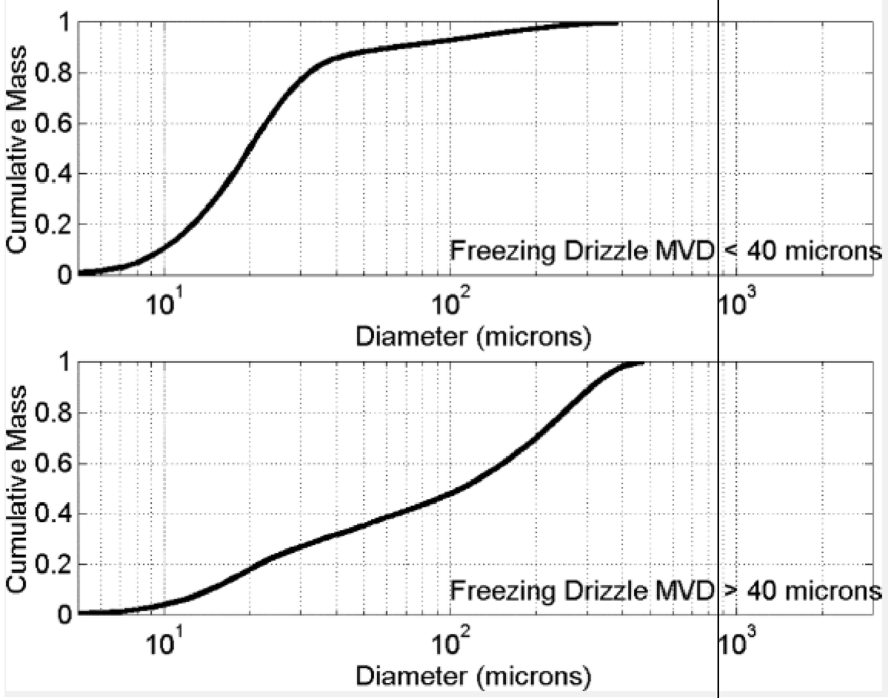


FIGURE 3 — Appendix O, Freezing Drizzle, Temperature and Altitude

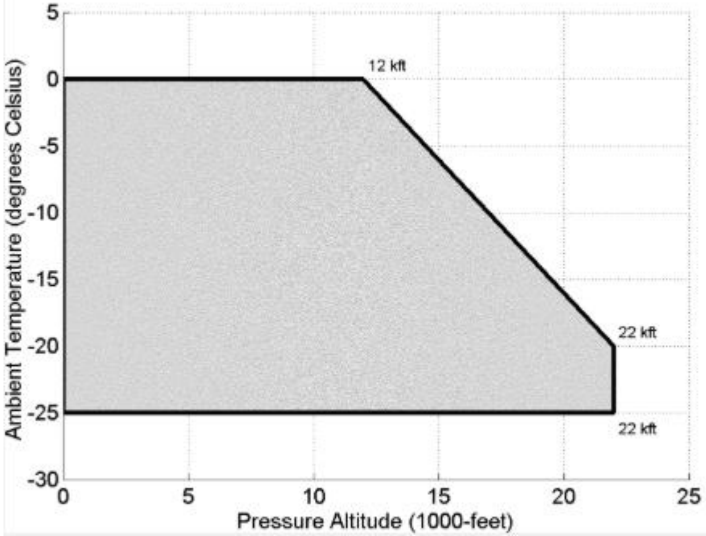


FIGURE 4 — Appendix O, Freezing Rain, Liquid Water Content

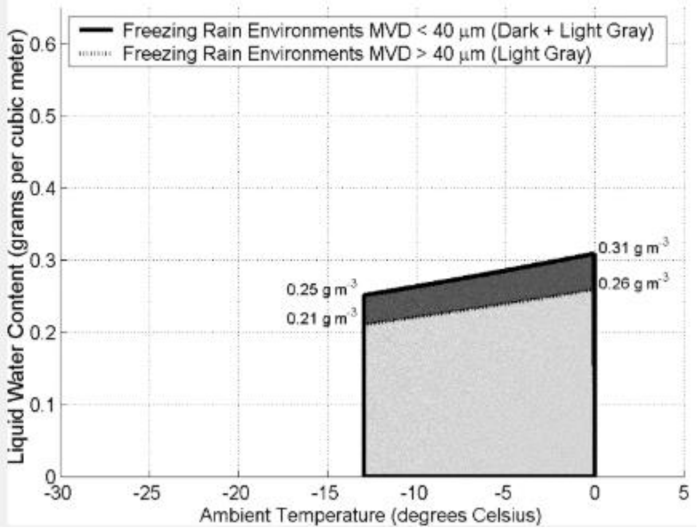


FIGURE 5 — Appendix O, Freezing Rain, Drop Diameter Distribution

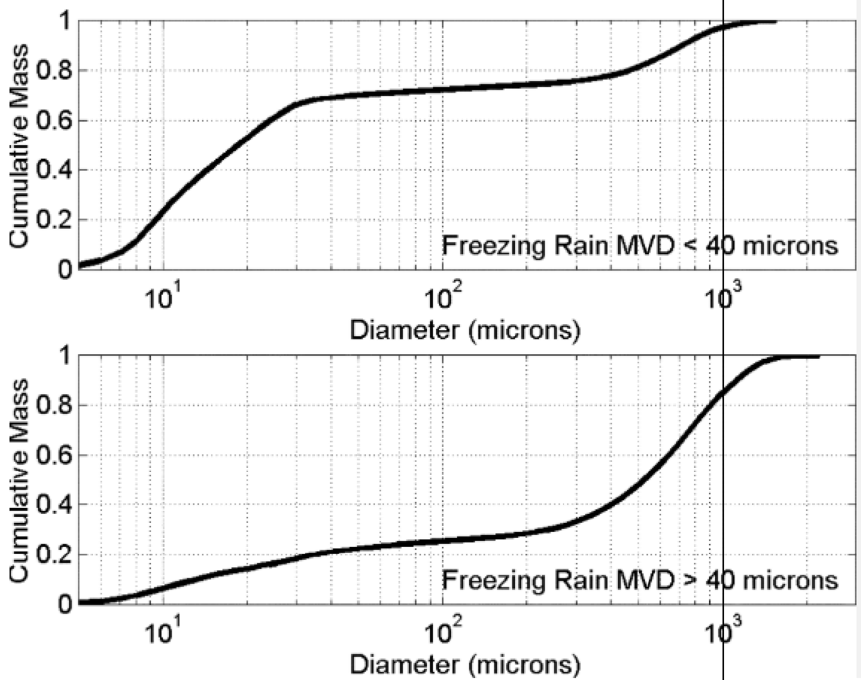


FIGURE 6 — Appendix O, Freezing Rain, Temperature and Altitude

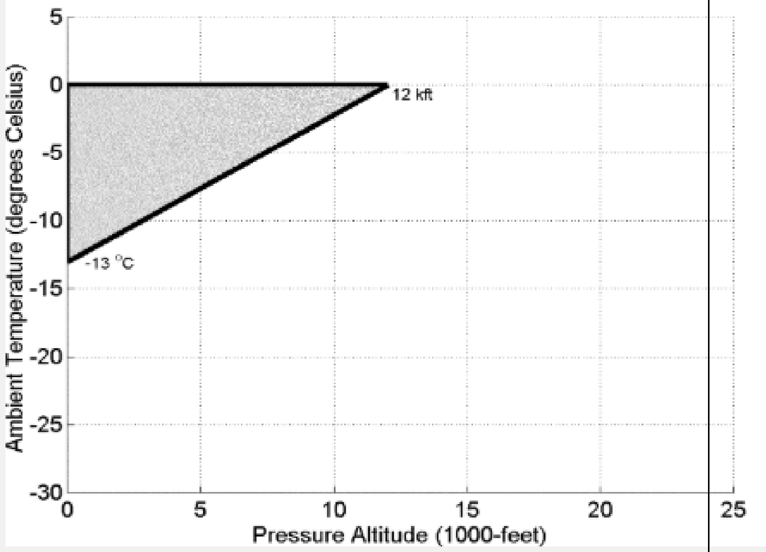
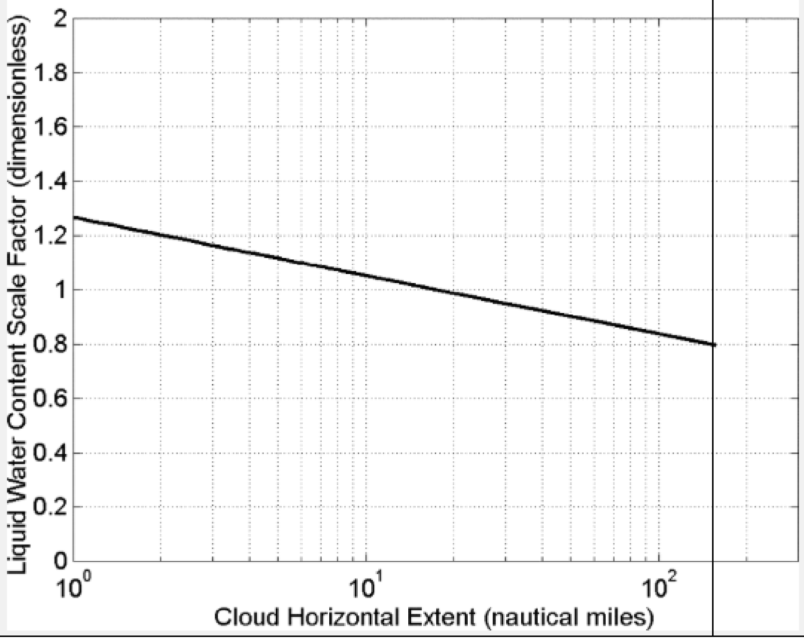


FIGURE 7 — Appendix O, Horizontal Extent, Freezing Drizzle and Freezing Rain



	PART II—AIRFRAME ICE ACCRETIONS FOR SHOWING COMPLIANCE WITH SUBPART B OF THIS PART (a) *General.* The most critical ice accretion in terms of airplane performance and handling qualities for each flight phase must be used to show compliance with the applicable airplane performance and handling qualities requirements for icing conditions contained in subpart B of this part. Applicants must demonstrate that the full range of atmospheric icing conditions specified in part I of this Appendix have been considered, including drop diameter distributions, liquid water content, and temperature appropriate to the flight conditions (for example, configuration, speed, angle of attack, and altitude). (1) For an airplane certified in accordance with § 25.1420(a)(1), the ice accretions for each flight phase are defined in part II, paragraph (b) of this Appendix. (2) For an airplane certified in accordance with § 25.1420(a)(2), the most critical ice accretion for each flight phase defined in part II, paragraphs (b) and (c) of this Appendix, must be used. For the ice accretions defined in part II, paragraph (c) of this Appendix, only the portion of part I of this Appendix in which the airplane is capable of operating safely must be considered. (3) For an airplane certified in accordance with § 25.1420(a)(3), the ice accretions for each flight phase are defined in part II, paragraph (c) of this Appendix. (b) Ice accretions for airplanes certified in accordance with § 25.1420(a)(1) or (2). (1) *En route ice* is the en route ice as defined by part II, paragraph (c)(3), of this Appendix, for an airplane certified in accordance with § 25.1420(a)(2), or defined by part II, paragraph (a)(3), of Appendix C of this part, for an airplane certified in accordance with § 25.1420(a)(1), plus:	

	(i) *Pre-detection ice* as defined by part II, paragraph (b)(5), of this Appendix; and (ii) The ice accumulated during the transit of one cloud with a horizontal extent of 17.4 nautical miles in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (2) *Holding ice* is the holding ice defined by part II, paragraph (c)(4), of this Appendix, for an airplane certified in accordance with § 25.1420(a)(2), or defined by part II, paragraph (a)(4), of Appendix C of this part, for an airplane certified in accordance with § 25.1420(a)(1), plus: (i) *Pre-detection ice* as defined by part II, paragraph (b)(5), of this Appendix; and (ii) The ice accumulated during the transit of one cloud with a 17.4 nautical miles horizontal extent in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (iii) Except the total exposure to holding ice conditions does not need to exceed 45 minutes. (3) *Approach ice* is the more critical of the holding ice defined by part II, paragraph (b)(2), of this Appendix, or the ice calculated in the applicable paragraphs (b)(3)(i) or (ii) of part II, of this Appendix: (i) For an airplane certified in accordance with § 25.1420(a)(2), the ice accumulated during descent from the maximum vertical extent of the icing conditions defined in part I of this Appendix to 2,000 feet above the landing surface in the cruise configuration, plus transition to the approach configuration, plus: (A) *Pre-detection ice,* as defined by part II, paragraph (b)(5), of this Appendix; and	

	(B) The ice accumulated during the transit at 2,000 feet above the landing surface of one cloud with a horizontal extent of 17.4 nautical miles in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (ii) For an airplane certified in accordance with § 25.1420(a)(1), the ice accumulated during descent from the maximum vertical extent of the maximum continuous icing conditions defined in part I of Appendix C to 2,000 feet above the landing surface in the cruise configuration, plus transition to the approach configuration, plus: (A) *Pre-detection ice*, as defined by part II, paragraph (b)(5), of this Appendix; and (B) The ice accumulated during the transit at 2,000 feet above the landing surface of one cloud with a horizontal extent of 17.4 nautical miles in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (4) *Landing ice* is the more critical of the holding ice as defined by part II, paragraph (b)(2), of this Appendix, or the ice calculated in the applicable paragraphs (b)(4)(i) or (ii) of part II of this Appendix: (i) For an airplane certified in accordance with § 25.1420(a)(2), the ice accretion defined by part II, paragraph (c)(5)(i), of this Appendix, plus a descent from 2,000 feet above the landing surface to a height of 200 feet above the landing surface with a transition to the landing configuration in the icing conditions defined in part I of this Appendix, plus: (A) *Pre-detection ice*, as defined in part II, paragraph (b)(5), of this Appendix; and (B) The ice accumulated during an exit maneuver, beginning with the minimum climb gradient required	

	by § 25.119, from a height of 200 feet above the landing surface through one cloud with a horizontal extent of 17.4 nautical miles in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (ii) For an airplane certified in accordance with § 25.1420(a)(1), the ice accumulated in the maximum continuous icing conditions defined in Appendix C of this part, during a descent from the maximum vertical extent of the icing conditions defined in Appendix C of this part, to 2,000 feet above the landing surface in the cruise configuration, plus transition to the approach configuration and flying for 15 minutes at 2,000 feet above the landing surface, plus a descent from 2,000 feet above the landing surface to a height of 200 feet above the landing surface with a transition to the landing configuration, plus: (A) *Pre-detection ice*, as described by part II, paragraph (b)(5), of this Appendix; and (B) The ice accumulated during an exit maneuver, beginning with the minimum climb gradient required by § 25.119, from a height of 200 feet above the landing surface through one cloud with a horizontal extent of 17.4 nautical miles in the most critical of the icing conditions defined in part I of this Appendix and one cloud with a horizontal extent of 17.4 nautical miles in the continuous maximum icing conditions defined in Appendix C of this part. (5) *Pre-detection ice* is the ice accretion before detection of flight conditions in this Appendix that require exiting per § 25.1420(a)(1) and (2). It is the pre-existing ice accretion that may exist from operating in icing conditions in which the airplane is approved to operate prior to encountering the icing conditions requiring an exit, plus the ice accumulated during the time needed to detect the icing conditions, followed by	

	two minutes of further ice accumulation to take into account the time for the flightcrew to take action to exit the icing conditions, including coordination with air traffic control. (i) For an airplane certified in accordance with § 25.1420(a)(1), the pre-existing ice accretion must be based on the icing conditions defined in Appendix C of this part. (ii) For an airplane certified in accordance with § 25.1420(a)(2), the pre-existing ice accretion must be based on the more critical of the icing conditions defined in Appendix C of this part, or the icing conditions defined in part I of this Appendix in which the airplane is capable of safely operating. (c) Ice accretions for airplanes certified in accordance with §§ 25.1420(a)(2) or (3). For an airplane certified in accordance with § 25.1420(a)(2), only the portion of the icing conditions of part I of this Appendix in which the airplane is capable of operating safely must be considered. (1) *Takeoff ice* is the most critical ice accretion on unprotected surfaces, and any ice accretion on the protected surfaces, occurring between the end of the takeoff distance and 400 feet above the takeoff surface, assuming accretion starts at the end of the takeoff distance in the icing conditions defined in part I of this Appendix. (2) *Final takeoff ice* is the most critical ice accretion on unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, between 400 feet and either 1,500 feet above the takeoff surface, or the height at which the transition from the takeoff to the en route configuration is completed and VFTO is reached, whichever is higher. Ice accretion is assumed to start at the end of the takeoff distance in the icing conditions defined in part I of this Appendix.	

	(3) *En route ice* is the most critical ice accretion on the unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, during the en route flight phase in the icing conditions defined in part I of this Appendix. (4) *Holding ice* is the most critical ice accretion on the unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, resulting from 45 minutes of flight within a cloud with a 17.4 nautical miles horizontal extent in the icing conditions defined in part I of this Appendix, during the holding phase of flight. (5) *Approach ice* is the ice accretion on the unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, resulting from the more critical of the: (i) Ice accumulated in the icing conditions defined in part I of this Appendix during a descent from the maximum vertical extent of the icing conditions defined in part I of this Appendix, to 2,000 feet above the landing surface in the cruise configuration, plus transition to the approach configuration and flying for 15 minutes at 2,000 feet above the landing surface; or (ii) *Holding ice* as defined by part II, paragraph (c)(4), of this Appendix. (6) *Landing ice* is the ice accretion on the unprotected surfaces, and any ice accretion on the protected surfaces appropriate to normal ice protection system operation, resulting from the more critical of the: (i) Ice accretion defined by part II, paragraph (c)(5)(i), of this Appendix, plus ice accumulated in the icing conditions defined in part I of this Appendix during a descent from 2,000 feet above the landing surface to a height of 200 feet above the landing surface with a transition to the landing configuration, followed by a go-around at the minimum climb gradient required by § 25.119, from a height of 200 feet above the landing surface to 2,000 feet above the landing surface, flying	

for 15 minutes at 2,000 feet above the landing surface in the approach configuration, and a descent to the landing surface (touchdown) in the landing configuration; or

(ii) *Holding ice* as defined by part II, paragraph (c)(4), of this Appendix.

(7) For both unprotected and protected parts, the ice accretion for the takeoff phase must be determined for the icing conditions defined in part I of this Appendix, using the following assumptions:

(i) The airfoils, control surfaces, and, if applicable, propellers are free from frost, snow, or ice at the start of takeoff;

(ii) The ice accretion starts at the end of the takeoff distance;

(iii) The critical ratio of thrust/power-to-weight;

(iv) Failure of the critical engine occurs at VEF; and

(v) Crew activation of the ice protection system is in accordance with a normal operating procedure provided in the airplane flight manual, except that after beginning the takeoff roll, it must be assumed that the crew takes no action to activate the ice protection system until the airplane is at least 400 feet above the takeoff surface.

(d) The ice accretion before the ice protection system has been activated and is performing its intended function is the critical ice accretion formed on the unprotected and normally protected surfaces before activation and effective operation of the ice protection system in the icing conditions defined in part I of this Appendix. This ice accretion only applies in showing compliance to §§ 25.143(j) and 25.207(h).

(e) In order to reduce the number of ice accretions to be considered when demonstrating compliance with the requirements of § 25.21(g), any of the ice accretions defined in this Appendix may be used for any other flight phase if it is shown to be at least as critical as the specific ice accretion defined for that

	flight phase. Configuration differences and their effects on ice accretions must be taken into account. (f) The ice accretion that has the most adverse effect on handling qualities may be used for airplane performance tests provided any difference in performance is conservatively taken into account.	