CONDIÇÃO EPECIAL

CE/SC nº 23 – 003

Título:	**Condição Especial Aplicável ao Sistema de Reserva de Potência**
Title:	**Special Condition for Automatic Thrust Reserv System**

Aprovação:	Resolução nº 127, de 1º de dezembro de 2009, publicada no Diário Oficial da União, N° 230, S/1, p. 35, de 2/12/2009	**Origem:** SAR

APLICABILIDADE

Esta condição especial se aplica ao sistema automático de reserva de potência do avião Embraer EMB-505.

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Esta condição especial complementa a seção 23.904 e o Apêndice H, incluindo requisitos relativos à fase de arremetida do voo.

"§ SC 23-003 Performance Credit for ATR during Go-Around.

The EMB-505 airplane must comply with the requirements of RBHA/14 CFR 23.904 and Appendix H to RBHA/14 CFR Part 23 including the following requirements pertaining to the go-around phase of flight:

1. Definitions

a) Automatic Thrust Reserve System (ATR) is defined as the entire automatic system available during take-off when selected by the pilot, during take-off data set, and always in go-around mode, including all devices, both mechanical and electrical, that sense engine failure, transmit signals, actuate fuel controls or power levers on operating engines including power sources, to achieve scheduled thrust or power increases, and furnish cockpit information on system operation.

b) Critical Time Interval

The definition of the critical time interval in RBHA/14 CFR Part 23 Appendix H 23.2(c) shall be expanded to include the following:

(i) When conducting an approach for landing using ATR, the critical time interval is defined as 120 seconds. A shorter time interval may be used if justified by a rational analysis. An accepted analysis that has been used on past aircraft certification programs is as follows:

(1) The critical time interval begins at a point on a 2.5 degrees approach glide path from which, assuming a simultaneous engine and ATR failure, the resulting approach climb flight path intersects a flight path originating at a later point on the same approach path corresponding to the RBHA 23 one-engine-inoperative approach climb gradient. The period of time from the point of simultaneous engine and ATR failure to the intersection of these flight paths must be no shorter than the time interval used in evaluating the critical time interval for take-off beginning from the point of simultaneous engine and ATR failure and ending upon reaching a height of 400 feet.

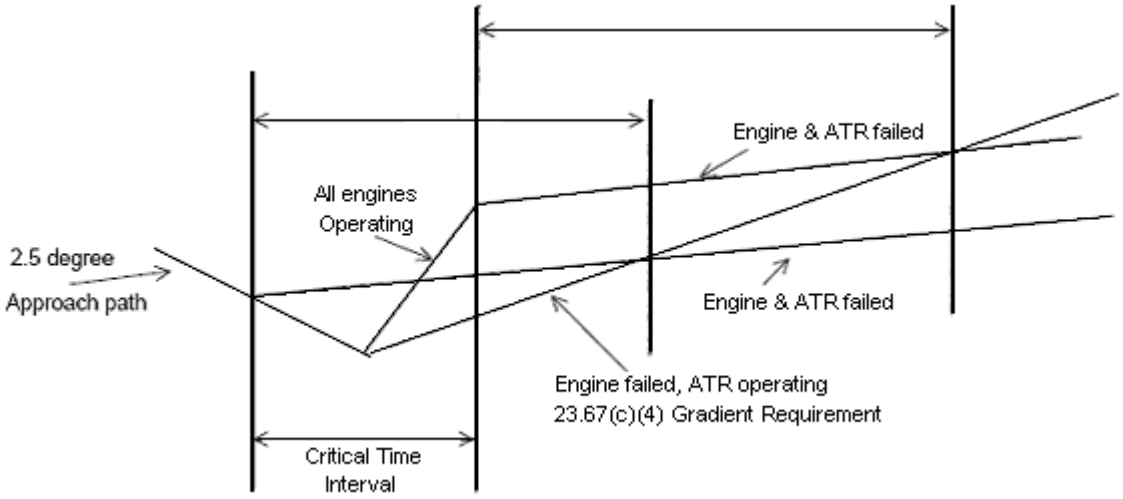
(2) The critical time interval ends at the point on a minimum performance, all-engines-operating go-around flight path from which, assuming a simultaneous engine and ATR failure, the resulting minimum approach

climb flight path intersects a flight path corresponding to the RBHA/14 CFR Part 23 minimum one-engine-inoperative approach climb gradient. The all-engines-operating go-around flight path and the RBHA/14 CFR Part 23 one-engine-inoperative approach climb gradient flight path originate from a common point on a 2.5 degrees approach path. The period of time from the point of simultaneous engine and ATR failure to the intersection of these flight paths must be no shorter than the time interval used in evaluating the critical time interval for the take-off beginning from the point of simultaneous engine and ATR failure and ending upon reaching a height of 400 feet.

(ii) The critical time interval must be determined at the altitude resulting in the longest critical time interval for which one-engine-inoperative approach climb performance data are presented in the airplane flight manual (AFM).

(iii) The critical time interval is illustrated in the following figure:

Figure 1:



- The engine and ATR failed time interval must be no shorter than the time interval from the point of simultaneous engine and ATR failure to a height of 400 feet used to comply with RBHA/14 CFR Part Appendix H23.2(c) for ATR use during take-off.

2. Performance and System Reliability Requirements

(a) It must be shown that, during the critical time interval, an ATR failure that increases or does not affect power on either engine will not create a hazard to the airplane, or it must be shown that such failures are remote.

(b) It must be shown that, during the critical time interval, there are no failure modes of the ATR system that would result in a failure that will decrease the thrust or power on either engine or it must be shown that such failures are extremely improbable.

(c) It must be shown that, during the critical time interval, there will be no failure of the ATR system in combination with an engine failure or it must be shown that such failures are extremely improbable.

(d) All applicable performance requirements of RBHA/14 CFR Part 23 must be met with an engine failure occurring at the most critical point during go-around with the ATR system functioning normally.

e) The probability analysis must include consideration of ATR failure occurring after the time at which the flight crew last verifies that the ATR is in a condition to operate until the beginning of the critical time interval.

f) The propulsive thrust obtained from the operating engine after failure of the critical engine during a go-around used to show compliance with the one-engine-inoperative climb requirements of RBHA/14 CFR Part 23.67(c)(4) may not be greater than the lesser of:

(i) The actual propulsive thrust resulting from the initial setting of power or thrust controls with the ATR system functioning; or

(ii) 111 percent of the propulsive thrust resulting from the initial setting of power or thrust controls with the ATR system failing to reset thrust or power and without any action by the crew to reset thrust or power.

3. Thrust Setting

a) The initial go-around thrust setting on each engine at the beginning of the go-around phase may not be less than:

(i) That required to permit normal operation of all safety-related systems and equipment that are dependent upon engine thrust or power lever position; and

(ii) That shown to be free of hazardous engine response characteristics when thrust or power is advanced from the initial go-around position power level to the maximum approved takeoff thrust or power.

b) For approval of an ATR system for go-around, the thrust setting procedure must be the same for go-around initiated with all engines operating as for go-around initiated with one engine inoperative.

4. Powerplant Controls

(a) In addition to the requirements of RBHA/14 CFR 23.1141, no single failure or malfunction, or probable combination thereof, of the ATR, including associated systems, may cause the failure of any powerplant function necessary for safety.

(b) The ATR must be designed to:

(1) Provide a means to verify to the flight crew before beginning an approach for landing that the ATR is in a condition to operate (unless it can be demonstrated than an ATR failure combined with an engine failure during an entire flight is extremely improbable)

(2) Automatically advance power on the operating engines following an engine failure during go-around to achieve the maximum attainable go-around thrust without exceeding engine operating limits;

(3) Prevent deactivation of the ATR by manual adjustment of the power levers following an engine failure;

(4) Provide a means for the flight crew to deactivate the automatic function. This means must be designed to prevent inadvertent deactivation; and

(5) Allow normal manual decrease or increase in thrust or power up to the maximum go-around thrust approved for the airplane under the existing conditions through the use of power levers, as stated in RBHA/14 CFR 23.1141(c), except as provided under paragraph 4(c) down.

(c) For airplanes equipped with limiters that automatically prevent engine operating limits from being exceeded, other means may be used to increase the maximum level of power controlled by the power levers in the event of an ATR failure. The means must be located on or forward of the power levers, must be easily identified and operated under all operating conditions by a single action of any pilot with the hand that is normally used to actuate the power levers, and must meet the requirements of RBHA/14 CFR 23.777 (a), (b), and (c).

5. Powerplant Instruments

In addition to the requirements of RBHA/14 CFR 23.1305:

(a) A means must be provided to indicate when the ATR is in the armed or ready condition; and

(b) If the inherent flight characteristics of the airplane do not provide adequate warning that an engine has failed, a warning system that is independent of the ATR must be provided to give the pilot a clear warning of any engine failure during go-around.
(c) Following an engine failure during a go-around maneuver, there must be means for the crew to readily and quickly verify that the ATR has operated satisfactorily."