| **NOTICE OF PROPOSED REGULATION**<br>**BRAZILIAN AIRWORTHINESS DIRECTIVES** | **REPÚBLICA FEDERATIVA DO BRASIL**<br>**AGÊNCIA NACIONAL DE AVIAÇÃO CIVIL – ANAC**<br>**Gerência Geral de Certificação de Produto Aeronáutico** |
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***Reference:*** *NPR/AD 2024-190-02* ***Date:*** *06 May 2024*

*In accordance with the provisions of RBAC 11, The Continuing Airworthiness Technical Branch (GTAC) is proposing the issuance of a Brazilian Airworthiness Directive applicable to the aeronautical product referred below.*

*All the persons interested may send their comments until the date specified in item 2, indicating the* ***Reference*** *above, to the following address:*

*National Civil Aviation Agency (ANAC) – Continuing Airworthiness Technical Branch (GTAC)*
*Rua Doutor Orlando Feirabend Filho, nº 230*
*Centro Empresarial Aquárius - Torre B – 14º ao 18º andares*
*Parque Residencial Aquárius*
*12246-190 – São José dos Campos – SP - Tel.: (12) 3203-6600 - E-mail: pac@anac.gov.br.*

***1. Proposer:*** *Continuing Airworthiness Technical Branch (GTAC).*
***2. Comments:*** *Must be received until 05 Jul. 2024.*

**APPLICABILITY:**

**(a)** This Airworthiness Directive (AD) applies to Embraer S.A. airplanes ERJ 190-100 ECJ as identified in Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024.

**CANCELLATION / REVISION:**

Not applicable.

**REASON:**

This AD was prompted by a quality escape occurred on Kidde Aerospace & Defense manufacturing line affecting some Overheat Detection System (ODS) sensing elements produced before 31 January 2021. A defective sensing element may not be able to detect a thermal bleed leak, which is a latent failure, and depending on the affected area, may start an ignition source in the fuel tank, damaging some electronic boxes and expose the wing structure to high temperature gradients and unexpected thermal loads.

Since this condition may occur in other airplanes of the same type and affects flight safety, a corrective action is required. Thus, sufficient reason exists to request compliance with this AD in the indicated time limit.

**REQUIRED ACTION:**

Inspection and replacement, if necessary, of some ODS sensing elements of the airplane bleed lines.

**COMPLIANCE:**

Required as indicated below, unless already accomplished.

**(b) Inspection and replacement of the ODS sensing elements of stub, e-bays, cargo compartment and wing Leading Edge (LE) areas of the airplane.**

**(1)** Within 7,500 Flight Hours (FH) or 36 months after the effective date of this AD, whichever occurs first, inspect the ODS sensing elements of stub, e-bays, cargo compartment and wing LE areas of the airplane.

**(i)** If there is any TRUE condition of OVERHEAT, SHORT or OPEN CONDITION on "BLEED ODS NVM READ/RESET TEST" page of Central Maintenance Computer (CMC), or there is no 0.00 (ZERO) "EVENT LOCATION" indication for the loops of the APU, then do the applicable troubleshooting according to the airplane Fault Isolation Manual (FIM) and accomplish the required actions of the paragraphs **(b)(1)(ii)** and **(b)(1)(iii)** of this AD.

**(ii)** Make sure that there is a FALSE condition of OVERHEAT, SHORT and OPEN CONDITION on "BLEED ODS NVM READ/RESET TEST" page of CMC, and there is 0.00 (ZERO) "EVENT LOCATION" indication for the loops of the APU.

**(iii)** Make sure that the correlated Crew Alerting System (CAS) message associated with the affected inspected Part Number (P/N) is not active on Engine Indicating and Crew Alerting System (EICAS)

display (see the Table 1) and perform a Detailed Inspection (DET) of sensing elements according to the detailed instructions and procedures described in Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024; or further revisions approved by ANAC.

**Table 1 – Affected P/N x CAS message**.

| Inspected area. | Affected P/N. | CAS message. |
|---|---|---|
| APU Bleed Line, Center Fuselage II. | 04-90005-180A, 04-90005-116A and 04-90005-122A | BLEED APU LEAK |
| APU Bleed Line, Center Fuselage III. | 04-90005-145A, 04-90005-146A and 04-90005-147A | BLEED APU LEAK |
| Anti-Ice, Left Hand (LH) Pylon. | 04-90005-015A | A-I WING 1 LEAK |
| Anti-Ice, Right Hand (RH) Pylon. | 04-90005-015A | A-I WING 2 LEAK |
| Bleed LH Wing. | 04-90005-085A | BLEED 1 LEAK |
| Bleed RH Wing. | 04-90005-084A, 04-90005-086A and 04-90005-087A | BLEED 2 LEAK |

**(iii)-a** If during the required inspections the applicable CAS message, as shown in the Table 1, comes into view on EICAS display, no action is required.

**(iii)-b** If there is no applicable CAS message into view on EICAS display, as shown in the Table 1, at any of tested positions, identify in CMC the channel with TRUE condition of SHORT. Replace the sensor associated to the other channel, ie, the sensor with FALSE condition of SHORT and in case of both channels presenting FALSE condition of SHORT, then replace both sensors by new ones with the same Part Number (P/N) or with a P/N presented in the Aircraft Illustrated Parts Catalog (AIPC), according to the detailed instructions and procedures described in Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024; or further revisions approved by ANAC.

**(iv)** In case of any sensor replacement, repeat the DET required by the paragraphs **(b)(1)(iii)** of this AD to make sure that the channels are operational.

**NOTE:** For the purposes of this AD, a Detailed Inspection (DET) is defined as follows.

**Detailed Inspection (DET):** An intensive examination of a specific item, installation or assembly to detect damage, failure or irregularity. This could include tactile assessment in which a component or assembly can be checked for tightness/security. Available lighting is normally supplemented with a direct source of good lighting at an intensity deemed appropriate. Inspection aids such as mirrors and magnifying lenses may be necessary. Surface cleaning and elaborate access procedures may be required.

**(c) Inspection and replacement of the ODS sensing elements of LH and RH wing bleed system and Trim Pressure Ducts areas of the airplane.**

**(1)** Within 7,500 FH or 36 months after the effective date of this AD, whichever occurs first, inspect the ODS sensing elements of LH and RH wing bleed system and Trim Pressure duct areas of the airplane.

**(i)** If there is any TRUE condition of OVERHEAT, SHORT or OPEN CONDITION on “BLEED ODS NVM READ/RESET TEST” page of CMC, or there is no 0.00 (ZERO) “EVENT LOCATION” indication for the loops of the APU, then do the applicable troubleshooting according to the airplane FIM and accomplish the required actions of the paragraphs **(c)(1)(ii)** and **(c)(1)(iii)** of this AD.

**(ii)** Make sure that there is a FALSE condition of OVERHEAT, SHORT and OPEN CONDITION on "BLEED ODS NVM READ/RESET TEST" page of CMC, and there is 0.00 (ZERO) "EVENT LOCATION" indication for the loops of the APU.

**(iii)** Make sure that the correlated CAS message associated with the affected inspected P/N is not active on EICAS display (see the table 2) and perform a DET of sensing elements according to the detailed instructions and procedures described in Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024; or further revisions approved by ANAC.

**Table 2 – Affected P/N x CAS message.**

| Inspected area. | Affected P/N. | CAS message. |
|---|---|---|
| Bleed LH pylon. | 04-90005-105C | BLEED 1 LEAK |
| Bleed RH pylon. | 04-90005-109C | BLEED 2 LEAK or PACK 2 LEAK |
| Bleed, wing to fuselage fairing. | 04-90005-096A | BLEED 2 LEAK or PACK 2 LEAK |
| Bleed, wing to fuselage fairing. | 04-90005-094A, 04-90005-096A and 04-90005-163A | BLEED 1 LEAK |
| Bleed, wing to fuselage fairing. | 04-90005-099A and 04-90005-155A | BLEED 2 LEAK or PACK 2 LEAK |
| APU bleed line, rear fuselage. | 04-90005-172A | BLEED APU LEAK |
| Trim air, wing to fuselage fairing. | 04-90005-099A, 04-90005-130A and 04-90005-136A | BLEED 2 LEAK or PACK 2 LEAK |

**(iii)-a** If during the required inspections the applicable CAS message, as shown in the Table 2, comes into view on EICAS display, no action is required.

**(iii)-b** If there is no applicable CAS message into view on EICAS display, as shown in the Table 2, at any of tested positions, identify in CMC the channel with TRUE condition of SHORT. Replace the sensor associated to the other channel, ie, the sensor with FALSE condition of SHORT and in case of both channels presenting FALSE condition of SHORT, then replace both sensors by new ones with the same P/N or with a P/N presented in the AIPC, according to the detailed instructions and procedures described in Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024; or further revisions approved by ANAC.

**(iv)** In case of any sensor replacement, repeat the DET required by the paragraphs **(c)(1)(iii)** of this AD to make sure that the channels are operational.

**(d) Parts installation prohibition.**

From the effective date of this AD, do not install an affected part at any position of the airplane as described in the paragraphs **(b)** thru **(c)** of this AD, except it is an airworthy part.

**NOTE 1:** For the purpose of this AD, an affected part is an overheat detection system (OHDS) sensing elements, also identified as "Embraer - Continuous Fire Detector (CFD)", having a Part Number (P/N) and corresponding date code as listed in Section 1.A of the Kidde Aerospace & Defense Service Bulletin (SB) CFD-26-4, dated February 28, 2022, except those that passed an inspection (no discrepancies found; one face of the connector hex nut is marked) in accordance with the detailed instructions and procedures of the of Section 3 of the Kidde Aerospace & Defense SB CFD-26-4, dated February 28, 2022.

**NOTE 2:** For the purpose of this AD, an airworthy part is one that is not an affected part.

**(e) Credit for previous actions.**

This paragraph provides credit for the actions specified in paragraph **(b)** thru **(c)** of this AD, if those actions were performed before the effective date of this AD according to Embraer SB N. 190LIN-36-0013, original issue, dated April 28, 2021 or Embraer SB N. 190LIN-36-0013, revision 01, dated July 04, 2022 or Embraer SB N. 190LIN-36-0013, revision 02, dated December 14, 2022.

**(f) Alternative methods of compliance (AMOCs).**

A different method or a different compliance time, with the requirements of this AD, may be used if approved by the Manager of the Continuing Airworthiness Technical Branch (GTAC) of ANAC.

**(g) Material incorporated by reference.**

You must use the Embraer Service Bulletin N. 190LIN-36-0013, revision 03, dated April 20, 2024; or further revisions approved by ANAC, and Kidde Aerospace & Defense Service Bulletin CFD-26-4, dated February 28, 2022; to do the actions required by this AD, unless this AD specifies otherwise.

Record compliance with this AD in the applicable maintenance log book.