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WORKING PAPER

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Agenda Item 5: Regional Safety Performance and Implementation Support

TEN REFLECTIONS FOR CIVIL AVIATION AUTHORITIES BASED ON THE FINAL REPORT OF THE 2283 (VOEPASS) ACCIDENT

(Presented by Secretariat)

EXECUTIVE SUMMARY

This working paper presents to the meeting a document prepared by the SAM Regional Office containing ten reflections addressed to Civil Aviation Authorities (CAAs) in the region, developed from the analysis of the Final Report of the accident involving flight PS-VPB, operated by VoePass (ATR 72-212A (500)), which occurred on 9 August 2024 in Vinhedo, Brazil, and was investigated by CENIPA.

Action:	The meeting is invited to note the content of this Paper, and to consider the suggested action in Section 5.
Strategic Objectives:	• Every Flight Is Safe and Secure
References:	Voepass Flight 2283 Accident Final Report

1. Introduction

1.1 This Working Paper presents to the meeting a document prepared by the SAM Regional Office containing ten reflections addressed to Civil Aviation Authorities (CAAs) in the region, developed from the analysis of the Final Report of the accident involving flight PS-VPB, operated by VoePass (ATR 72-212A (500)), which occurred on 9 August 2024 in Vinhedo, Brazil, and was investigated by the Aviation Accident Investigation and Prevention Center (CENIPA).

1.2 The document, available on the ICAO South American Regional Office website at https://www.icao.int/south-american-sam-office , does not summarize the accident; rather, it uses its findings as the starting point for ten self-assessment questions addressed to CAAs, covering surveillance risk management, the effectiveness of operators' SMS/FDM, the integrity of maintenance data, the normalization of deviance, flight dispatch, UPRT training, CRM, crew mental well-being, and the capacity to detect patterns of procedural non-compliance.

2. Background

2.1 On 9 August 2024, flight PS-VPB, an ATR 72-212A (500) operated by VoePass, crashed in Vinhedo, State of São Paulo, Brazil, as a result of a stall associated with performance degradation caused by ice accumulation, resulting in the loss of all 62 persons on board. CENIPA published the Final Report of the investigation, which identifies a combination of technical, operational, organizational and surveillance-related contributing factors.

2.2 Civil Aviation Authorities are responsible for exercising continuous safety oversight that enables the timely detection of deficiencies in the aviation system — both their own and those of the operators they regulate — and for adopting the corresponding actions to mitigate identified risks, in line with the provisions of ICAO Annex 19 and the principles of the State Safety Programme (SSP).

2.3 The Final Report of the VoePass accident is particularly relevant to the region because it documents, with detailed evidence, the gap that can exist between the formal existence of oversight and control mechanisms and their real effectiveness in preventing the progressive degradation of an operator's safety conditions.

3. Discussion

3.1 The Final Report describes in considerable detail the continuous surveillance findings prior to the accident, the functioning of the operator's SMS and flight data monitoring (FDM) programme, the management of the technical log, the dynamics of normalization of deviance within the pilot group, the flight dispatch process, the UPRT and CRM training received by the crew, and other contributing organizational and human factors.

3.2 Based on a detailed reading of the body of the report, the SAM Regional Office identified ten reflections that go beyond the specific case and apply, to a greater or lesser extent, to any State in the region, or the world. Each reflection is accompanied by direct excerpts from the report that support it and a self-assessment question, so that CAAs can review whether the equivalent controls in their own civil aviation system are functioning adequately to prevent an accident with similar characteristics.

3.3 A theme running through several of the reflections is the need for a functional SSP — not merely a formally implemented one — and the need to move toward risk-based oversight schemes that allow inspection resources to be prioritized according to real risk exposure, rather than relying exclusively on a traditional oversight model oriented toward verifying documentary compliance and isolated procedures.

4. Conclusions

4.1 Aviation accidents are, by their nature, multicausal events. The Final Report of the VoePass accident, and particularly the ten reflections contained in the document, constitute a concrete opportunity for the region's CAAs to review their own safety oversight procedures and practices.

4.2 In terms of James Reason's causation model, each CAA represents one of the system's barriers. Strengthening surveillance capacity to detect and act on latent conditions — before they align with active failures — is, ultimately, the most direct contribution a Civil Aviation Authority can make to preventing similar accidents.

5. Suggested Action

5.1 The meeting is invited to:

a) note the information contained in this working paper and its Appendix;

b) request RASG-PA members to disseminate the published document; and

c) request RASG-PA member States to report, as appropriate, to the ESC/42 meeting on actions taken in line with the reflections contained in the Appendix.

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ICAO

PS-VPB Accident

10 Reflections for Civil Aviation Authorities

September 2026

Purpose and Approach

This document has been prepared for the sole purpose of contributing to the prevention of aviation accidents and incidents, consistent with the principle established in Annex 13 to the Convention on International Civil Aviation, according to which the sole objective of the investigation of accidents and incidents is the prevention of future occurrences, and not the apportionment of blame or liability.

ICAO recognizes that behind every investigation there are individuals, families and communities affected. In line with the policy on assistance to aircraft accident victims and their families (AAAVF), this document has been drafted with the utmost respect for the memory of the victims and for the dignity of their families. Any detail not strictly necessary for the preventive purpose has been deliberately avoided, as has any element that could identify the persons involved or prove unnecessarily sensitive.

The reflections that follow are only possible thanks to the technical quality, analytical depth and transparency of the Final Report prepared by the Aeronautical Accident Investigation and Prevention Center (CENIPA) of Brazil.

This work is based on the English-language version of the Final Report, available on the CENIPA website: Final Report PS-VPB (English version) — CENIPA. The page references indicated in parentheses throughout this document correspond to that version. This material does not replace, supplement or reinterpret the Final Report; in the event of any divergence, the original text prevails. Readers are strongly encouraged to consult the Final Report in full.

An invitation to review our own defenses

“The invitation is to read these reflections from a deliberately self-critical standpoint: do we have the necessary mechanisms in place? Are they up to date? Do they actually work when they are needed?”

Safety demands far more than following processes: it requires maintaining the ability to recognize, interpret and act on the signals the system presents to us. Over time, even the most established surveillance activities can become routine or mechanical, creating the risk that signs of degradation are viewed in isolation and never become a timely warning.

This document presents ten reflections for Civil Aviation Authorities, built from the lessons of a real accident. Its purpose is not to look back in order to judge what happened, but to use that experience to critically examine our own systems and ask whether similar situations could develop today without being detected or corrected in time.

The invitation is to read these reflections from a deliberately self-critical standpoint: do we have the necessary mechanisms in place? Are they up to date? Do they actually work when they are needed? If any of these questions creates doubt, the reflection has already achieved part of its purpose: identifying an opportunity to strengthen our defenses before they are tested by an accident.

Contenido

How to read this document?

The document presents ten reflections for Civil Aviation Authorities (CAAs), each developed on a separate page and following a common structure. The description below explains how each reflection is organized and the purpose of its three sections

Reflection title

Introduces a topic relevant to CAAs and proposes a reflection on its possible relationship with accident prevention.

What does the Report say?

This section brings together the facts, findings, conclusions or recommendations from the Final Report that support the reflection. The page of the Final Report where each reference can be consulted is indicated in parentheses.

Self-assessment question: Invites each CAA to assess whether it has real and effective defenses to identify and control similar situations before they can become part of a chain of events leading to an accident.

Reflection 1 — Do surveillance data lead to strategic decisions?

For years, the authority's surveillance activities detected virtually all of the latent conditions that were later present in the accident. The question this case poses to each CAA is not whether we conduct surveillance, but whether our risk management process is capable of converting recurrent findings into timely strategic decisions — prioritization, restriction, escalation — before the system fails. What aggregate signal, and at what threshold, would today trigger a strategic intervention on an operator in our State?

What does the Report say?

- *The audits and inspections conducted by ANAC on the operator prior to the accident revealed several technical and procedural nonconformities related to aircraft maintenance, component traceability, noncompliance with MEL conditions, and the recurrent practice of informal reporting or non-reporting of malfunctions.*
- *Using the Agency's metric (queries identified during surveillance actions per 1,000 takeoffs), a total of 768 queries were identified in 2023 and 483 in 2024 for the VoePass, Passaredo and MAP group, while the operator represented approximately 0.6% of the Brazilian scheduled aviation network volume (p.127).*
- *Between 2022 and 2024, ANAC imposed several precautionary aircraft suspensions on the operator; the peak occurred in 2023, when aircraft were prevented from being operated on 24 occasions, with five such cases through August 2024. Ramp inspections had been conducted monthly since January 2022 (p.130).*
- *The Commission concluded that the signs identifying hazards, degradation of technical conditions, and latent conditions prior to the accident were not capable, when analyzed within the scope of ANAC's risk management process, of supporting the strategic decision-making necessary for the mitigation and control of risks. It further concluded that the means for recording, processing and monitoring data and information related to hazards for risk-management purposes were still in a maturation phase, allowing the continuity of the company's operations despite degradation of the safety levels (pp.248 and 253).*
- *Safety Recommendation A-116/CENIPA/2024-07: revise and update ANAC's internal risk management processes prescribed in the PSOE-ANAC, in particular those arising from continuous surveillance activities, so that they are capable of supporting the strategic decision-making necessary for the mitigation and control of risks (p.254).*

Self-assessment question 1: Does your State have a defined mechanism that converts recurrent surveillance findings into a strategic decision regarding an operator, and is that mechanism applied systematically before the system fails?

Reflection 2 — SMS and FDM: do we produce data or decisions?

The operator had the infrastructure and data needed to see the accident coming: an active FDM program that repeatedly recorded performance degradation under icing conditions. The case illustrates the difference between an SMS that is formally implemented and one that is operationally effective — the same gap between a "solid standard" and "implementation without real evidence" that the Region knows well from the USOAP CMA. How do our States verify, through SSP/SMS surveillance, that FDM data effectively feed the operator's risk management process?

What does the Report say?

- *The Commission analyzed 15,365 flights performed by the company's ATR aircraft between August 2023 and August 2024 and compared them with a database comprising more than 120,000 flights by other operators of the same model. The company presented the highest percentage of APM events: 10.9% of its flights had at least one APM advisory/alert (8.5% CRUISE SPEED LOW; 1.8% DEGRADED PERFORMANCE; 0.6% INCREASE SPEED), values higher than those observed among the other operators (p.210).*
- *The company's aircraft were operating in cruise with indicated airspeeds averaging between 5 and 10 kt below the IAS Theoretical, pointing to greater operational exposure to the risk of aircraft performance degradation under icing conditions (p.210).*
- *Finding "g": although the operator had the infrastructure and data necessary to identify hazards based on actual flight parameters, "there was no evidence that this information had been systematically converted into corrective, doctrinal, or procedural actions" (p.248).*
- *The operator's SMS had a maturity index below the average of other operators governed by RBAC 121 and, in practice, failed to fulfill its proactive role in ensuring safety, as prescribed by ICAO Annex 19 and ANAC regulations (p.209).*
- *Because the company operated aircraft with an MTOW below 27,000 kg, it was not required to implement a PAADV/FDM program. Nevertheless, the operator voluntarily submitted its PAADV to ANAC and thereby formally assumed the commitment to keep the program active, functional and continuously feeding back into the SMS — a commitment that did not materialize in practice (p.209).*

Self-assessment question 2: Does your State verify that operators' FDM data are effectively translated into corrective actions, and that the program's applicability criteria reflect the actual risk of the operation?

Reflection 3 — Data integrity: without a record, there is no defense

Every system barrier — MEL, corrective maintenance, dispatch, planning — depends on an elementary act: recording the malfunction. The case shows how a culture of non-recording can simultaneously blind the operator, the authority and the next flight crew. For the Region, the question connects directly with the protection and quality of safety data (Annex 19): what evidence do we collect through surveillance about the fidelity of the technical record, rather than merely the existence of the procedure?

What does the Report say?

- *Findings "h", "j" and "k": there was a culture of absence of formal recording in the TLB, which prevented the company's technical and operational departments from applying corrective action; the aircraft had no record of an Airframe De-Icing system malfunction in the TLB; and, despite the malfunction, the aircraft was dispatched without the restrictions imposed by the MEL being recorded (p.248).*
- *ANAC identified a practice of successive renewal of the three-day MEL Category B rectification period for the Airframe De-Icing system: when the period expired, operational tests were performed without corrective maintenance, the system was declared functional, and the failure reappeared on subsequent flights, repeatedly renewing the rectification period and extending operation with the unresolved discrepancy (p.129).*
- *Between 2022 and 2024, ANAC issued ten notifications of irregular condition related to the Airframe De-Icing system. These involved bubbles, tears and irregular repairs on the boots, frequently without records describing the failure conditions or dispatch restrictions through the MEL. The Agency also verified that many existing boot damages were not being identified during Daily/Weekly Checks because corresponding entries were absent from the TLB (p.129).*
- *Contributing factor "Aircraft maintenance — a contributor": the absence of formal recording in the TLB following in-flight failures prevented mitigating measures such as dispatch under the MEL, aircraft substitution, route replanning, or corrective maintenance (p.251).*

Self-assessment question 3: As part of its continued surveillance processes, does your State have mechanisms to cross-check maintenance records (TLB) against independent sources — work orders, component history, physical inspections — so that it can detect under-reporting or discrepancies rather than merely verify that the TLB has been completed?

Reflection 4 — Normalization of deviance: when the alert stops alerting

Using objective FDM data, the Report documents the mechanism by which a group of pilots — not a single individual — can come to trivialize aircraft alerts: repetition without consequences, absence of an organizational response, and a false sense of safety. This is a direct lesson for State data-driven surveillance programs: an abnormal frequency of a "minor" event is, in itself, an indicator of systemic risk. Do our SSPs monitor indicators of this kind at fleet level?

What does the Report say?

- *History of aircraft PS-VPB: of the 1,206 flights analyzed since August 2023, 394 (32.67%) were categorized as HIGH by the Commission for failing to meet one or more stabilization criteria below 500 ft AGL (p.137).*
- *During the accident flight, the CRUISE SPEED LOW advisory was triggered eight times; the DEGRADED PERFORMANCE alert occurred 1 minute and 42 seconds before activation of the Stall Warning System; and the INCREASE SPEED alert occurred 13 seconds before it. No actions by the flight crew were identified that indicated recognition, awareness or processing of the APM system advisories/alerts (p.249).*
- *On the immediately preceding flight ("flight -1"), the DEGRADED PERFORMANCE and INCREASE SPEED alerts had already occurred. No records were found of any communication between the flight crew and the CCO that could have triggered a closer monitoring protocol (Section 2).*
- *Contributing factor "Work-group culture — a contributor": the frequent occurrence of advisories and alerts, especially those related to the APM system, generated complacency within the company's pilot group, culminating in reduced vigilance and relaxation in the face of their high repetitiveness, supported by a false sense of safety based on previous experience in which no consequences had been associated with such actions (p.251).*
- *Contributing factor "Organizational culture — a contributor": the pilots' decisions were influenced by an organizational context marked by multiple vulnerabilities in the safety culture, in which "the acceptance of deviations had become normalized and the aircraft alerts had become trivialized, reducing risk perception" (p.251).*

Self-assessment question 4: Does your State verify that operators' SMSs detect and correct repetitive elements — alerts, deviations — before they become normalized, and does the State itself have an equivalent system for fleet-level monitoring, detection and timely correction?

Reflection 5 — The cycle works: independent investigation, State self-scrutiny and systemic change

Perhaps the most valuable lesson for the region is the report itself as a product: a State that investigates with technical independence, addresses safety recommendations to its own oversight authority and documents concrete systemic changes achieved prior to publication. It is a practical demonstration of the return on investment in AIG capability — precisely the area with the lowest effective implementation globally — and of the value of publishing complete and timely Final Reports, an essential input for regional safety data management.

What does the Report say?

- *The Report issues nine safety recommendations: four to EASA, addressing icing procedures, FDR parameters and APM alert levels; and five to ANAC, including the revision of its internal risk-management processes and dissemination of the lessons learned to operators governed by RBAC 121 (pp.253–255).*
- *Manufacturer action already implemented: APM software Version 2.0, certified by EASA for incorporation into the fleets through Service Bulletin ATR-72-31-1137 dated 26JUN2025, was developed through interaction between the Investigation Commission and ATR engineering. In a simulation of the accident flight using APM V2, a new DEGRADED PERFORMANCE alert was generated approximately 27 minutes before the moment at which the same alert was activated during the actual flight (pp.255–256).*
- *Regulatory action: Amendment No. 22 to RBAC 121, approved in August 2025, expanded the applicability of the PAADV/FDM requirement to aircraft with an approved MTOW exceeding 15,000 kg, making it mandatory for all aircraft models currently used in RBAC 121 operations, including the entire ATR fleet in service in Brazil (p.257).*
- *Surveillance action: following the accident, ANAC intensified its oversight activities and implemented an assisted operation regime. On 11 March 2025, the Agency precautionarily suspended the company's Air Operator Certificate (COA) and Maintenance Organization Certificate (COM); on 24 June 2025, both certificates were revoked and pecuniary sanctions were imposed (pp.257–258).*

Self-assessment question 5: When accident investigation is part of the CAA itself, can your State conduct a truly impartial investigation and, where warranted, identify its own departments as contributing to an occurrence without fear of institutional or employment retaliation — with the real independence required by Annex 13?

Reflection 6 — Flight dispatch: how robust is our surveillance in detecting risk, not just paperwork?

Every flight dispatch goes through an administrative check: that the documentation is complete, that the records are signed, that the meteorological package has been provided to the crew. But that formal check answers a different — and easier — question from the one that really matters: whether the specific combination of conditions authorized by that dispatch exposed the operation to a real risk, even beyond what was envisaged in the manufacturer's certification. The accident has already occurred; what remains for the Region is a prospective question: if there had been no accident, would State surveillance — or the operator's own SMS — have identified that the operation had been unnecessarily exposed? If the answer is probably not, then surveillance is not looking where it should. Its purpose is not to verify that the dispatch barrier exists, but to audit whether that barrier is capable of detecting real risk exposure — or whether it is itself another barrier riddled with holes.

What does the Report say?

- *The continuous surveillance actions described in the case were predominantly technical and maintenance-oriented — including Airframe De-Icing boots, tires, pressurization and component traceability. The Report does not describe a surveillance inspection specifically aimed at assessing the quality of meteorological analysis or the dispatch decision (p.127).*
- *Despite the intensity of that technical surveillance — 768 queries in 2023, 483 in 2024, and 24 precautionary aircraft suspensions in 2023 — the accident flight was dispatched with a cruise profile that coincided, spatially and temporally, with areas under valid severe-icing SIGMET warnings, and no surveillance instrument identified that exposure before the accident (Section 2).*
- *Findings "m" and "n": the meteorological conditions at the planned flight level constituted an environment conducive to SEV ICE and were below the minima for conducting the flight; and the meteorological conditions forecast for the route, prior to aircraft dispatch, were not adequately evaluated by the CCO, DOV and PIC (p.248).*
- *Contributing factor "Flight planning — a contributor": the flight-planning process did not involve effective integration among the responsible sectors, nor did it include continuous and proactive support from the CCO, failing to mitigate foreseeable risks arising from documented hazards (p.252).*
- *The administrative escalation instruments documented in the case — precautionary measures, suspensions and operational restrictions — are described as responses to maintenance-related nonconformities. The Report does not identify an equivalent escalation triggered by dispatch or operational-control findings, suggesting that this type of risk was not being captured by the same regulatory response mechanisms (pp.126–130).*

Self-assessment question 6: Does your State have an inspection methodology capable of detecting whether a dispatch exposed the operation to a real risk, rather than merely whether the documentation was complete?

Reflection 7 — UPRT training: do we certify that the program exists, or verify that competence is actually embedded?

A training program can satisfy every regulatory requirement — simulator hours, approved scenarios, qualified instructors — and still fail to produce what it is supposed to produce: the correct response under the real stress of an unexpected event. The gap between completing a course and responding correctly at the critical moment is not visible on a compliance checklist; it only becomes visible when it is too late. Do our UPRT program approval and audit processes have any ability to distinguish a program that builds real competence from one that merely satisfies the syllabus? This requires looking at three things: whether we have specific inspection procedures to assess the quality — not merely the existence — of these programs; whether our inspectors are actually qualified to perform that assessment; and whether we have verified that the simulators used by each operator are actually approved and representative for the full-stall and icing-degradation scenarios that the training claims to cover. Without an accident, could any routine audit have detected that this gap existed in this specific crew before they encountered it in flight?

What does the Report say?

- *Contributing factor "Qualification and Training — undetermined": although the pilots had completed the training required by the regulatory requirements related to operations under conditions conducive to severe ice formation and upset prevention and recovery training (UPRT), the actions observed during the accident flight were not consistent with the theoretical and practical knowledge expected from such training. The pilots did not recognize in a timely manner the severity of the condition, did not respond adequately to the risks associated with recurrent alerts, and ultimately acted on the flight controls in a manner divergent from that prescribed in training (p.250).*
- *The Commission assessed the flight crew's training and qualification records, with emphasis on UPRT and icing. Although the training complied with regulatory requirements and covered the necessary technical aspects, the investigation identified that the transfer of theoretical knowledge into practical action in a real-world situation may have been insufficient, particularly in the face of the combination of individual, psychosocial and organizational factors (p.235).*
- *RBAC 121 requires UPRT to be conducted in a flight simulator approved by ANAC, and states that, for maneuvers involving a full aerodynamic stall or the effects of ice accretion on the airframe and engines, "the simulators must be specifically approved for such conditions." The Report does not document any surveillance verification of that specific approval for this operator, nor of inspector qualification to assess the pedagogical quality of the program beyond documentary compliance (p.192).*
- *Section 1.13.3 describes the Startle Effect as an involuntary neurological and physiological response triggered by sudden and unexpected stimuli. Threatening stimuli may be processed through the amygdala rather than through the brain's natural information-processing pathway in the prefrontal cortex, potentially leading to instinctive and inappropriate actions and impairing decision-making and situational awareness — precisely the gap the training seeks to address and that was not closed in this case (pp.67–68).*
- *The corrective action adopted by ANAC after the accident acknowledges that the issue was not unique to this case: "ANAC was aware that several accidents had as a contributing factor the inadequate application by pilots of the knowledge associated with UPRT training." The response included a dedicated study group and a BCAST Operational Safety Bulletin issued in January 2026 — a response triggered after multiple events rather than through routine surveillance of training effectiveness (p.257).*

PSelf-assessment question 7: Does your State have access to properly qualified inspectors to assess UPRT programs, systematically implement a methodology to verify that the simulators used are effectively approved for those scenarios, and systematically and carefully analyze the results to identify gaps between formal training and actual performance?

Reflection 8 — CRM: do we have a methodology to verify that it is practiced, or do we simply assume it was trained?

CRM is probably the most universally required and one of the most difficult training programs to audit in commercial aviation: every operator provides it, every crew completes it periodically, yet its actual application — day-to-day cockpit discipline, task management, and giving operational matters priority over conversation — takes place in a space that no documentary inspection can see. Three concrete questions follow for every CAA in the Region. First, is there a specific methodology — beyond verifying that the course was delivered — to determine whether an operator's CRM is actually adequate in line operations? Second, when we oversee flight-data monitoring programs (FDM/PAADV), do those programs include triggers or clear and direct references to CRM phenomena, or are they built exclusively around technical aircraft parameters? Third, if CRM ultimately depends on the operator's self-assessment within its SMS, what verification mechanism does the State have to ensure that the operator will identify and correct its own CRM gaps in a timely manner, rather than discovering them — as in this case — only after an accident?

What does the Report say?

- *The company's PAADV was built around approximately 180 recorded flight parameters. A typical ATR flight-data analysis program could use approximately 100 of those parameters, with triggers programmed to detect around 130 distinct types of operational events. The triggers and events were established based on aircraft manuals and the operator's SOPs, and were parametric in nature (speed, attitude, system activation). The Report does not describe a trigger or event category specifically aimed at cockpit discipline, communication, or CRM dynamics (pp.134–135).*
- *Contributing factor "Crew Resource Management — a contributor": "The inadequate management of the tasks assigned to each crew member, the failure in communication, and the noncompliance with operational standards characterized inefficiency in cockpit coordination, in which threat management was not jointly mitigated," contributing to continuation of the flight in an environment of increasing risk (pp.250–251).*
- *IS 119-008A requires the operator to establish a "just culture," and the applicable IS and operator's manual assign the Gate Keeper a mediating role in monitoring and handling operational events identified through FDM, including technical analysis, operational contextualization, risk assessment and definition of subsequent actions. In other words, the identification and correction of behavioral gaps is, by regulatory design, largely placed in the operator's own process; the Report does not describe an independent State mechanism for verifying that this self-correction cycle works in practice (pp.135–136).*
- *Among the continued-surveillance categories documented in the case — ramp inspections, reduced-scope inspections, follow-up flight surveillance inspections and maintenance-base audits — none is described as including a structured observation or assessment methodology for CRM in line operations (such as LOSA or an equivalent method), nor does the Report refer to such a methodology in the applicable regulatory framework (p.126).*

Self-assessment question 8: Does your State have, and systematically implement, an approved methodology to assess whether adequate CRM is actually practiced in line operations, beyond verifying that the course was delivered?

Reflection 9 — Crew mental well-being: what does the State require and verify beyond the periodic medical examination?

Aeronautical medical certification assesses psychophysical fitness at specific points in time — at entry and at each periodic renewal — but real life unfolds between those points, and personal circumstances may arise that affect operational performance without being captured in time by a periodic examination. The question here is not what one particular operator did or failed to do, but what the State requires of all operators it regulates. Does our regulatory framework require operators to have mechanisms — peer-support programs, non-punitive reporting policies, early-intervention channels — to identify when a crew member is not fit to operate, beyond physical illness? And if that obligation exists on paper, does State surveillance ever verify that those mechanisms work in practice, or has their existence never been inspected because it falls outside the traditional — technical and documentary — scope of aviation oversight?

What does the Report say?

- *The only requirement documented in the Report regarding crew psychophysical fitness is the validity of the Aeronautical Medical Certificate (CMA) — a periodic point-in-time control rather than a continuous one (finding "a"; Section 1.5.5). The Report does not refer to any additional regulatory requirement in force at the time of the accident concerning peer-support programs or early-identification mechanisms for personal difficulties that could affect fitness to operate (pp.19 and 248).*
- *The Report documents that the PIC was experiencing personal difficulties at the time of the occurrence. The operator was aware of the situation and reportedly offered him the possibility of temporary leave from flight duties, which he declined. In the absence of a State requirement or standard defining how such situations should be managed, the matter remained dependent on the organization's own judgment, without an external verification point described in the Report (p.66).*
- *Contributing factors "Emotional state — undetermined" and "External influences — undetermined": the PIC's personal problems and emotional state may have influenced his behavior during the flight, reduced his engagement in critical decisions, diverted his attentional focus from operationally relevant stimuli, and reduced his risk perception (p.251). The Commission therefore identified a safety-relevant vulnerability for which the regulatory framework described in the Report did not include a pre-flight intervention mechanism.*
- *Among the continued-surveillance categories documented in the case — ramp inspections, base audits and follow-up flight surveillance — none is described as including verification of the existence or functioning of mental well-being, peer-support, or early-intervention mechanisms at regulated operators (Section 1.17.6). The Report also does not issue a safety recommendation specifically addressing this topic.*

Self-assessment question 9: Does your State require and verify that its operators have peer-support or non-punitive reporting mechanisms to identify crew members who are not fit to operate?

Reflection 10 — When no procedure is executed: does our surveillance detect patterns, or only verify isolated procedures?

A routine inspection typically verifies whether one specific procedure was executed correctly: the checklist for a malfunction, the protocol for an alert, the recovery maneuver for a critical condition. But when, on the same flight, none of five different procedures — corresponding to entirely independent systems and situations — is executed as prescribed, this is no longer an isolated failure. It is evidence that procedural execution, as a general practice, had eroded within that crew or organization. That aggregate pattern is structurally invisible to an inspection methodology that samples procedures in isolation, one at a time, on different flights or in different events. The question for the Region is whether our surveillance has, at some level of analysis, the ability to aggregate signals of non-execution across different systems in order to recognize a pattern of generalized erosion in procedural compliance — or whether, by design, each finding is evaluated within its own silo and the pattern becomes visible only after an accident, when it is already too late to intervene.

What does the Report say?

- *During the accident flight, prescribed procedures were not executed in at least five independent systems or situations: the Airframe De-Icing system failure (finding "s"), the CRUISE SPEED LOW advisory (finding "x"), the DEGRADED PERFORMANCE alert (finding "z"), the INCREASE SPEED alert (finding "cc"), and stall recovery (finding "ee") (p.249).*
- *Contributing factor "Attitude — a contributor": the pilots failed to execute operational procedures prescribed in the QRH throughout the flight. This conduct reflected an inadequate posture on the part of the flight crew, "suggesting tacit acceptance of deviations from established operational standards," and contributed to the escalation of operational risk throughout the flight (p.250).*
- *A similar pattern was observable on the immediately preceding flight ("flight -1"), where performance-degradation alerts had already occurred and no records were found of communication between the flight crew and the CCO that could have triggered a closer monitoring protocol. The pattern of non-execution was therefore not confined to the accident flight but was observable in previous operations of the same aircraft (p.220).*
- *The history of aircraft PS-VPB showed that, of the 1,206 flights analyzed since August 2023, 394 (32.67%) were categorized as HIGH for failing to meet one or more stabilization criteria below 500 ft AGL — an aggregate pattern of procedural nonconformity that existed in the operator's FDM data well before the accident, but that the Report does not link to a specific State surveillance intervention (pp.136–137).*
- *The continued-surveillance activities documented in the case — ramp inspections, reduced-scope inspections, follow-up flight surveillance inspections and maintenance-base audits — were each structured to assess particular areas, systems or requirements at specific points in time. The Report does not describe an analytical methodology that aggregates such individual findings across domains in order to detect a cross-cutting pattern of erosion in procedural compliance within the organization (p.126).*

Self-assessment question 10: Does your State have mechanisms to detect, aggregate, and analyze patterns of procedural non-compliance across different systems and flights, rather than assessing each finding in isolation?