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Operational Vulnerabilities and Emergency Response in Selected Aviation Accidents in 2026: An Exploratory Documentary Thematic Analysis

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ABSTRACT

This study identifies recurring operational and emergency-response themes in eleven aviation accident accounts listed by 1001Crash for 2026 and assessed through 14 October 2026. An exploratory qualitative document analysis used explicit semantic codes, a transparent case-by-code audit trail, and descriptive counts of overlapping themes. This analysis used official preliminary investigation materials from Indonesia, Nigeria, and the United States selectively to contextualise selected events rather than verify every case. The study identified five themes: approach and landing hazard interfaces (63.6%), technical anomalies and unavailable systems (54.5%), operational information and coordination (36.4%), geographic and infrastructural constraints on emergency options (36.4%), and survivability or harm beyond the aircraft (63.6%). Four cases involved runway excursions, two mountainous approach impacts, and one a landing collision with a runway vehicle. The accounts also distinguish aircraft-occupant outcomes from fatalities on the ground. Findings describe patterns in this small, heterogeneous, non-probability documentary corpus; they are not causal determinations, population accident rates, or estimates of risk. The study offers a reproducible preliminary thematic framework to support focused follow-up research on approach safety, navigation information, runway coordination, diversion options, emergency access, and injury-outcome reporting.

Keywords: aviation accidents; thematic analysis; runway excursions; operational information; emergency response

1. Introduction

Aviation accident investigation connects observable events with the operational, technical, organisational, environmental, and emergency-response circumstances in which they occur (Xiang et al., 2025). Published accounts make these circumstances accessible to researchers, but a narrative written during an ongoing investigation is not equivalent to a final causal finding (Karanikas & Passenier, 2019). The International Civil Aviation Organization (2025) distinguishes among categories such as runway incursion, controlled flight into terrain, system/component failure, and loss of control in its safety reporting. This categorisation illustrates the breadth of safety contexts and the need to avoid collapsing diverse occurrences into a single explanation (Ison, 2026).

Qualitative analysis can complement event classification by tracing recurring meanings and interfaces across individual accounts (McCall, 2020). For example, a runway excursion may involve stopping distance, wind, runway condition and braking capability; an approach accident may raise different questions about terrain clearance, navigation information and controller support (Garcia et al., 2023). These connections are particularly

important where available documentary evidence describes operational sequences but does not establish why the final outcome occurred. Thematic analysis provides a way to organise such information while preserving its uncertainty (Braun & Clarke, 2006; Byrne, 2021).

The 1001Crash 2026 listing provides a bounded collection of eleven accident records dated from 17 January to 5 October 2026 (1001Crash, 2026). Its cases include passenger flights, freight operations, maritime surveillance and a military movement. Consequently, the listing cannot be assumed to represent a uniform airline sector, a complete global accident census or a denominator for incidence estimates (Kelly & Efthymiou, 2019). Still, the linked descriptions allow structured comparisons of conditions visible in public accident narratives.

This study asks: What recurring operational and emergency-response themes appear in the selected 2026 aviation accident accounts? Its objectives are to (a) construct transparent case-level semantic codes, (b) identify and describe cross-case themes, (c) quantify their coverage within the selected corpus without treating coverage as population prevalence, and (d) derive evidence-proportionate priorities for aviation safety and emergency-management research. The principal contribution is a transparent linkage between case-level narrative evidence, operational themes, and research questions that require confirmation through formal investigation. The study places a separate emphasis on source discrepancies, because even an internally consistent thematic matrix can inherit incorrect aircraft or casualty details from changing reports.

2. Literature Review

2.1 Aviation risk as an interacting system

Modern aviation safety assessment requires attention to interfaces rather than isolated hazards. Accident information by occurrence category and associated consequences, recognising that different events may present distinct pathways to injury or loss (Moura et al., 2017). In this study, the classification context motivates separate treatment of runway excursions, runway-vehicle collisions and mountainous approach impacts (Oehling & Barry, 2019). An event setting is not itself a causal label: for instance, a terrain impact does not automatically establish controlled flight into terrain, nor does a reported malfunction establish maintenance failure (Leveson, 2012).

This distinction is supported by preliminary investigation practice. The Indonesian National Transportation Safety Committee documents information available during the inquiry into an ATR 42-500 accident and expressly cautions that a preliminary report may change as the investigation proceeds (Basaria, 2023). Similarly, the Nigerian Safety Investigation Bureau (2026) reports factual findings and safety recommendations from its Enugu Air runway-overrun investigation without purporting to determine a final probable cause. These records underscore the value of capturing the evidential status of every claimed condition.

2.2 Approach, landing and the information environment

The final phases of flight concentrate navigation, terrain clearance, runway availability, weather, aircraft handling and coordination into a limited time and distance. The LaGuardia runway collision illustrates one interface: a landing aircraft and an airport rescue vehicle occupied the active runway in the same operational window (Yan et al., 2025). The Enugu Air runway excursion provides another: the official preliminary material describes landing beyond the runway threshold, an excursion, damage to landing gear and evacuation without injury (2026). In both cases, an operational narrative supports investigation of coordination and safety margins, not an immediate assignment of individual fault.

Preliminary information concerning the September 2026 Miami cargo-aircraft overrun, including the ground casualties and a sequence of touchdown, braking and go-around-related inputs (Weick, 1990). Such case-specific detail strengthens a discussion of landing performance, but the preliminary status requires careful qualification. Discrepancies involving navigation indications and surveillance information during an approach near mountainous terrain (Campbell et al., 2018). Taken together, these accounts support examining information continuity and physical manoeuvring margins as related but separate dimensions of aviation safety.

2.3 Emergency landing options, rescue access and outcomes

An abnormal flight condition may require a diversion or an emergency landing, but the availability of usable landing locations and access to a crash site vary geographically (Donato & Atkins, 2017). The 1001Crash narratives describe an unavailable former airfield near Kenge, delayed rescue from forest terrain near Buruko and difficulties associated with offshore wreckage recovery (1001Crash, 2026a, 2026b, 2026). These descriptions invite a spatial

interpretation: aircraft and responders depend on the location, accessibility, condition and operational status of suitable alternatives (Nospes & Stütz, 2022). They do not, on their own, demonstrate that a particular rescue interval caused the reported fatal outcome (Quon & Laube, 1991).

Safety outcomes must also distinguish people aboard an aircraft from others exposed to an accident (Schick et al., 2024). The Miami event is an especially clear example because the two aircraft occupants survived, whereas five people on the ground died (Board, 2026). Case-level distinctions among evacuation, recovered survivors, post-impact fire, ground casualties and damage provide a fuller account of consequences than a single fatalities column (Hinkelbein et al., 2024).

2.4 Documentary thematic analysis and evidential boundaries

Flexible process involving familiarisation, coding, theme development, review, definition and reporting (Farooqi et al., 2021). The interpretive work involved in moving from descriptive codes to meaningful themes (Byrne, 2021). Here, that sequence informed an exploratory semantic synthesis of public documents (Byrne, 2021). The design is deliberately more structured and count-oriented than a full reflexive thematic analysis: explicit inclusion rules and a fixed case matrix improve traceability, but theme frequencies cannot establish statistical representativeness or causal independence. This distinction is important because narrative coverage, investigation progress and reporting conventions vary across cases (Beverland & Lindgreen, 2009; Waal, 2026).

The research gap addressed is therefore modest and specific: to provide a documented thematic account of one selected 2026 accident listing that distinguishes reported conditions, recurring interpretive patterns and questions suitable for later investigation (Abdat et al., 2014; Moura et al., 2017). This account does not replace the analytical authority of final accident investigation reports.

This approach deliberately separates three levels of inference: documented event descriptions, cross-case interpretive patterns, and prospective safety-research hypotheses (Benner, 1975; Cr, 1974). For example, a reference to an inoperative autobrake establishes a documented system state, whereas a claim that it caused a runway excursion would require independent causal analysis. Similarly, aircraft access to an active runway is a coordination setting rather than, by itself, evidence of an identified rule violation. These distinctions follow the cautious reporting appropriate to preliminary safety investigations (Board, 2026, 2026; Transportasi, 2026).

3. Methodology

3.1 Research design and corpus

An exploratory qualitative documentary design combined semantic coding with simple descriptive frequencies. The sampling frame was the set of eleven cases visible on the 1001Crash annual page when assessed on 14 October 2026 (1001Crash, 2026). The occurrence dates spanned 17 January–5 October 2026. Each case was represented by its annual-list entry together with the corresponding detail account. All eleven listed cases were included, regardless of flight purpose, severity or location; no claim is made that the site indexes all global civil aviation accidents (Passarella et al., 2023; Wild et al., 2021).

The case corpus comprised C01–C11 in date order. The annual listing provides the sampling frame (1001Crash, 2026); the corresponding individual accident accounts are identified in the source note to Table 1. Supplementary official materials were consulted for the Indonesian ATR case (Transportasi, 2026), the Nigerian Enugu Air event (2026), and the LaGuardia and Miami accidents (Board, 2026a, 2026b). These materials serve as case-specific corroboration or qualification; they do not constitute uniform official verification across the eleven cases.

The 1001Crash annual listing was treated as a fixed, purposively bounded research corpus rather than a complete accident population (Barua et al., 2026; Feliciani et al., 2023). Case identifiers remain stable even if linked webpages are subsequently updated. The inclusion boundary is therefore reproducible as an as-of-date selection, but the website's eligibility decisions and retrospective changes are outside the study's control (Ertek & Kailas, 2021; Feliciani et al., 2023).

3.2 Units of analysis, source hierarchy and extraction

The unit of analysis was a case, not an individual paragraph, passenger, accident factor, or aircraft movement (Giustiniano et al., 2015; Tanguy et al., 2015). For each case, the event date, aircraft/operator, location, described sequence, accident setting, technical indications, weather, information or coordination issues, emergency access, occupant outcome and harm outside the aircraft were identified when explicitly stated (Haunschild & Sullivan,

2002; Hinkelbein et al., 2024). Official investigation information was given greater interpretive weight for the specific event it covered; where reports remained preliminary, that status was maintained. A source's silence about a condition was treated as unreported, not evidence of its absence (Gill et al., 2013).

No flight-recorder datasets, investigator interviews, raw airline operations records or standardised exposure measures were available to this documentary analysis. Counts refer solely to the published descriptions and are not a sample of departures, air-hours or all reportable occurrences (Cookson, 2025).

Documentary source hierarchy was applied only where a relevant official report was available: case-specific factual statements in official preliminary material took precedence over conflicting secondary summaries, but preliminary status did not confer authority for a final causal conclusion (Giustiniano et al., 2015). The remaining cases retain secondary-source status. A recorded value or condition should be reassessed if later certified records conflict with it (Johansson, 2000).

3.3 Coding and theme development

The analysis followed six practical stages informed by Byrne (2021): familiarisation with the eleven records; creation of explicit semantic codes; grouping of related codes; comparison across cases; definition of five interpretive themes; and narrative reporting with case-level audit tables (Wong et al., 2026). Semantic codes describe identifiable content, such as a runway overrun or an explicitly reported technical anomaly. Themes interpret how such content may connect across several occurrences, without asserting a shared cause (Milch & Laumann, 2018).

The five themes were constructed from the fifteen codes, not calculated as mutually exclusive clusters. RE, RC and TERR define the approach/landing theme; TECH defines the technical-anomaly theme; INFO defines operational information; ACCESS or LIMIT defines constrained emergency options; and EVAC, EXT, FIRE, NF or RESCUE defines survivability and external harm. The last is explicitly an outcome-and-response grouping, not a unitary causal process. The combination rules are reported in Table 4.

A code could be assigned only when its inclusion rule was met by a stated source detail. Each code was counted at most once in each case. A case could receive multiple codes and multiple themes; therefore, thematic percentages must not be summed. The codebook (Table 2) and theme membership matrix (Table 3) define the decision rules and allow the reader to inspect every assignment. No independent second-coder validation, intercoder reliability coefficient or saturation claim is made. The coding is an AI-assisted exploratory synthesis whose interpretations remain provisional.

The codebook specifies a positive-evidence rule: silence about a condition is recorded as not evidenced and never interpreted as proof that it was absent. For cases with more than one code, the narrative can support overlapping themes; the codes should not be counted as separate accidents. Since the analysis has no second independent analyst, the matrix permits reproducible inspection of assignments but does not provide a measure of intercoder agreement.

3.4 Descriptive analysis and sensitivity checks

For each theme j, coverage was calculated as $\frac{n_j}{11} \times 100$, where n_j is the number of case narratives meeting that theme's inclusion rule. Themes were not treated as independent or mutually exclusive. Descriptive counts were additionally produced for four runway excursions, one runway-vehicle collision and two mountainous approach impacts. The casualty reconciliation retained separate aircraft-occupant and ground-death fields. An exclusion sensitivity check recalculated themes for the ten non-military cases, without implying that those ten were otherwise homogeneous.

As an additional descriptive check, pairwise co-occurrence counts were calculated by summing, across the eleven cases, the product of two binary theme indicators. These counts describe cases assigned to both themes; they are not tests of association or evidence that themes cause one another. The outcome is reported in Table 5, while the case-by-theme inputs remain visible in Table 3.

3.5 Ethics and quality assurance

The study uses publicly available secondary accident narratives and official public reports; it includes no recruitment or intervention with human participants. Quality safeguards comprised stable case identifiers, case-specific coding rules, explicit separation of observed and inferred conditions, and transparent treatment of changing

or inconsistent records. All available reports were considered as of 14 October 2026. This reporting cut-off is substantive: later investigative conclusions could legitimately change the classification or interpretation of individual cases.

4. Results

4.1 Accident case register

The eleven records encompass varied aircraft missions, geographical settings and consequences. Table 1 reproduces the case register underlying all subsequent code and theme counts. Reports of deaths are source-specific; a ground casualty is not counted as an aircraft-occupant fatality.

Table 1. Chronological register of selected aviation accident accounts, 2026

Case and date	Operator, aircraft and location	Reported occurrence	Reported deaths
C01 17 Jan	Indonesia Air Transport ATR 42 Makassar, Indonesia	Approach ended in mountainous terrain impact. The account describes degraded navigation indications and terrain warnings	10
C02 28 Jan	Searca for Satena Beechcraft 1900D Ocaña, Colombia	Aircraft struck mountainous terrain while descending toward its destination. Low cloud near terrain is reported.	15
C03 10 Feb	Starsky Aviation Fokker 50 Mogadishu, Somalia	Reported technical problem prompted a return. Emergency landing ended in a runway veer-off toward the shoreline; all occupants survived.	0
C04 22 Mar	Jazz for Air Canada Express CRJ 900 LaGuardia, USA	Landing aircraft collided with a crossing fire vehicle. Both pilots died; people in the vehicle were injured.	2
C05 24 Apr	Transafrican Air / EBB Air Embraer 120 Mandera, Kenya	Runway overrun followed reported inadequate deceleration. An engine fire occurred after impact; occupants evacuated and one crew member had minor injuries.	0
C06 7 Jul	K2 Airways Boeing 737 freighter Arabian Sea, Pakistan	Reported navigation problem preceded extreme altitude changes and sea impact. ATC provided headings; deep water complicated wreckage recovery.	5
C07 23 Jul	Enugu Air Embraer 170 Benin City, Nigeria	Landing overrun involved a wet runway, reported tailwind, late touchdown and unavailable autobrake. All occupants evacuated without injury.	0
C08 24 Jul	TRACEP Congo Aviation Let L 410 Buruko, DR Congo	Reported engine power loss prompted diversion. Crash occurred in inaccessible forest; two survivors were evacuated six days later.	1
C09 6 Sep	21 Air for Amazon Boeing 767 freighter Miami, USA	Runway overrun continued beyond the airport and struck vehicles. Fire followed; five people on the ground died.	**0 + 5** ground
C10 25 Sep	TRACEP Congo Aviation Let L 410 Kenge, DR Congo	Technical problem prompted a search for an emergency landing site. Former airfield was unavailable; aircraft crashed and caught fire.	17
C11 5 Oct	Nigerian Air Force ATR 42 Igbokoda, Nigeria	Military flight crashed in a swamp near a waterway. Recovery access was difficult; the current annual and case-detail pages both report 25 fatalities.	25*

4.2 Semantic codebook and case-level frequencies

Fifteen codes were retained because they represented distinct kinds of content present in the event accounts. The largest single technical category was TECH (6 cases), followed by runway excursion (4 cases) and the information/coordination code (4 cases). These codes describe narrative mentions, not mutually exclusive causal factors.

Table 2. Semantic codebook, decision rules and matched cases

Code	Definition and inclusion rule	Cases	Matched cases
RE	Runway excursion. Explicit runway overrun or veer-off during landing.	4	C03, C05, C07, C09

Code	Definition and inclusion rule	Cases	Matched cases
RC	Runway vehicle collision. Aircraft collided with a vehicle on the active runway.	1	C04
TERR	Mountainous approach impact. Terrain impact during descent or approach near the destination. This code does not establish controlled flight into terrain.	2	C01, C02
TECH	Reported technical anomaly. Explicit technical problem, engine power loss, degraded navigation system, or unavailable aircraft braking automation. No technical root cause is assumed.	6	C01, C03, C06, C07, C08, C10
NAV	Navigation anomaly. Explicit unreliable or degraded aircraft navigation indications.	2	C01, C06
INFO	Operational information and coordination. Reported unreliable navigation information, missing runway or weather information, or conflicting runway access coordination. Includes reliance on ATC assistance after a navigation problem.	4	C01, C04, C06, C07
WX	Adverse flight weather. Rain, low cloud, thunderstorm, or adverse wind described during the accident flight. Weather during rescue alone is excluded.	4	C01, C02, C07, C09
ACCESS	Difficult site access. Explicit inaccessible forest or swamp, or deep-water wreckage recovery difficulty.	3	C06, C08, C11
LIMIT	Unavailable emergency landing site. A reported attempt to find a landing site where the former airfield was no longer operational.	1	C10
FIRE	Fire after impact. Fire explicitly described after impact. It is not treated as a proven cause of death.	3	C05, C09, C10
EVAC	Explicit occupant evacuation. Narrative explicitly reports occupant evacuation.	2	C05, C07
NF	No occupant fatalities. Source explicitly reports zero occupant deaths. Ground deaths are recorded separately.	4	C03, C05, C07, C09
RESCUE	Rescued crash survivors. Survivors were explicitly located and evacuated after the crash.	1	C08
EXT	Harm outside the aircraft. Persons on the ground or vehicle occupants were killed or injured.	2	C04, C09
REPEAT	Repeated operator occurrence. Two separate accidents involving the same operator within this corpus.	2	C08, C10

4.3 Theme coverage and case membership

Five related themes were developed from the codebook. The matrix makes the overlap visible: C07 is assigned four themes; C01 is assigned three, while C02 and C11 are each assigned one. This distinguishes the number of theme assignments per case from the theme totals. Theme coverage is shown in Tables 3 and 4. A dash indicates that the relevant inclusion condition was not evidenced in the available account.

Table 3. Case-by-theme membership matrix

Case	T1	T2	T3	T4	T5
C01	1	1	1	-	-
C02	1	-	-	-	-
C03	1	1	-	-	1
C04	1	-	1	-	1
C05	1	-	-	-	1
C06	-	1	1	1	-
C07	1	1	1	-	1
C08	-	1	-	1	1
C09	1	-	-	-	1
C10	-	1	-	1	1

Case	T1	T2	T3	T4	T5
C11	-	-	-	1	-
Cases	7	6	4	4	7
Percent	63.6%	54.5%	36.4%	36.4%	63.6%

Table 4. Theme definitions and frequency within the 11-case corpus

Theme	Central idea	Inclusion codes	Cases	Percent
T1	Approach and landing hazard interfaces	RC or RE or TERR	$\frac{7}{11}$	63.6%
T2	Technical anomalies reshape the flight task	TECH	$\frac{6}{11}$	54.5%
T3	Safety depends on reliable shared information	INFO	$\frac{4}{11}$	36.4%
T4	Emergency options depend on geography and infrastructure	ACCESS or LIMIT	$\frac{4}{11}$	36.4%
T5	Survivability and public harm extend the safety assessment	EVAC or EXT or FIRE or NF or RESCUE	$\frac{7}{11}$	63.6%

4.4 Cross-theme co-occurrence and interpretation

The most common theme pairing is T1 with T5 (five cases), followed by T2 with T5 (four cases). T1 and T4 do not co-occur in these eleven narratives. These differences reflect the reporting content and the particular code definitions, not relative causal connections among hazards or the operational independence of flight phases and emergency access. Table 5 provides the complete pairwise counts.

Table 5. Pairwise theme co-occurrence across eleven case narratives

Theme	T1	T2	T3	T4	T5
T1	7	3	3	0	5
T2	3	6	3	3	4
T3	3	3	4	1	2
T4	0	3	1	4	2
T5	5	4	2	2	7

5. Discussion

5.1 Theme 1: Approach and landing hazard interfaces

Seven of the eleven accounts are associated with approach or landing hazard interfaces: four runway excursions (C03, C05, C07 and C09), one collision between a landing aircraft and a runway vehicle (C04), and two impacts with mountainous terrain during approach (C01 and C02). The concentration within the listed cases does not establish that the accident rate is higher in these flight phases for aviation as a whole; this site's case selection process and its exposure denominators are unknown.

The runway cases exhibit different reported circumstances. Enugu involved a wet runway, a tailwind component, a late touchdown and an autobrake system known to be unavailable; its investigation remained preliminary (Kirkland & Caves, 2002). The Miami cargo accident also involved a runway overrun with post-impact fire and ground casualties; NTSB updates describe relevant recorder information, without establishing a final probable cause (Board, 2026). Mandera describes unexpectedly poor deceleration and a subsequent overrun, while Starsky involved an emergency return that ended in a veer-off toward the shoreline (1001Crash, 2026a, 2026b). Thus, weather and braking-related information appear in different combinations rather than in one uniform explanatory pathway.

The two mountainous approach cases (C01 and C02) further broaden the theme. The Indonesian inquiry contains information about navigation indications and terrain-warning interfaces (Transportasi, 2026), whereas the Colombian account describes low cloud close to terrain (1001Crash, 2026i). Neither description alone justifies a

definitive controlled-flight-into-terrain conclusion. The finding supports future investigation of available margins for stopping, terrain clearance and runway separation, and of how crews and air traffic services coordinate when these margins narrow.

5.2 Theme 2: Technical anomalies reshape the flight task

Six records explicitly mention a technical issue or unavailable aircraft system: C01, C03, C06, C07, C08 and C10. The scope ranges from degraded navigation indications in C01 and C06, to a reported problem preceding Starsky's return, reported engine power loss before a TRACEP diversion, unavailable autobrake in Enugu, and an unspecified problem before the Kenge emergency-landing search (1001Crash, 2026a, 2026b, 2026c, 2026d, 2026, 2026e; Transportasi, 2026).

This is a theme of abnormal capability and altered crew workload, not a finding that technical failure caused six accidents. Without maintenance, fault-recording and investigation evidence, an observed symptom cannot be translated into defective hardware or deficient maintenance. For the Enugu event, the published investigation describes the unavailable system as a condition noted in the approach briefing, but does not identify it as a proven cause (2026). Similarly, loss of power reported before the Buruko accident indicates a sequence that requires investigation rather than a complete accident mechanism.

5.3 Theme 3: Reliable and coordinated information

Four cases were assigned to the information and coordination theme (C01, C04, C06 and C07). The Indonesian case raises the relationship between aircraft navigation displays, ground surveillance and terrain warning (Transportasi, 2026). The LaGuardia collision involves active-runway access coordination between aviation and emergency-response vehicles (Board, 2026). In the K2 case, air traffic control provided headings after a reported navigation problem; this shows external navigational support and is not evidence that ATC created the problem (1001Crash, 2026). Enugu records concerns about available runway-condition and weather information during the landing operation (2026).

A common analytical focus is the quality, accessibility and alignment of information shared among aircraft, control units, airport personnel and on-board systems. The coding does not support labelling these events "human error," because it does not identify responsible decisions, causal relevance or procedural compliance. Consistent with accident-investigation principles, fuller conclusions would require controlled examination of radio communications, recorder data, operating procedures and system status.

5.4 Theme 4: Geography and infrastructure shape emergency options

Four records describe constrained landing, access or recovery options. In Kenge (C10), the former airfield was reportedly unavailable for an emergency landing; in Buruko (C08), rugged forest terrain, uncertain initial coordinates and limited road access complicated recovery; in the K2 offshore accident (C06), deep water obstructed wreckage recovery; and the Nigerian military flight (C11) ended in a swampy, difficult-to-access area (1001Crash, 2026a, 2026b, 2026, 2026c). Two survivors in the Buruko case were reported evacuated six days after the crash (2026).

Together, these accounts indicate the importance of viable diversion-site inventories, updated aerodrome status, spatial location accuracy and rescue logistics. Remote sensing, GIS-based site mapping and interoperable geospatial emergency information are reasonable subjects for future evaluation, especially over coastlines, islands, forests and offshore routes. The narratives do not permit estimates of lives that could have been saved by quicker access or adoption of a new technology.

5.5 Theme 5: Survivability and wider consequences

Seven accounts contain explicit information on occupant survival, evacuation, rescue, post-impact fire or harm outside the aircraft. Starsky, Mandera, Enugu and Miami report no aircraft-occupant deaths, but this does not mean there were no injuries or external fatalities. Miami recorded five deaths on the ground, even though its two crew members survived, demonstrating the consequences of treating "aircraft occupant fatalities" as a proxy for total human harm (Board, 2026). The LaGuardia runway collision involved injuries to people aboard a ground vehicle as well as fatalities among aircraft crew (Board, 2026).

Evacuation and post-impact outcomes also require separate analysis. Enugu's occupants evacuated without injury (2026); Mandera involved occupant evacuation and an engine fire after impact (1001Crash, 2026); Buruko included rescue of two crash survivors (2026); and Kenge described severe fire following impact (1001Crash,

2026). None of these accounts enables a controlled comparison of the effectiveness of evacuation practices, aircraft fire protection or rescue response times. Nevertheless, they show the importance of recording the consequences of the accident separately from its flight-phase setting.

Importantly, T5 combines several forms of evidence that must remain analytically distinct: absence of occupant fatalities, actual evacuation, post-impact fire, external casualties and documented survivor recovery. A single T5 count is a measure of whether at least one such outcome or response is described. It is not a severity scale, a measure of successful rescue or a proxy for the probability of death. The constituent codes in Table 2 preserve these distinctions.

5.6 Organisational recurrence and source-quality considerations

TRACEP Congo Aviation appears in two fatal occurrences within the defined corpus (C08 and C10). The Kenge account describes a subsequent suspension of the operator's Air Operator Certificate pending investigation (1001Crash, 2026). Two occurrences involving one operator warrant a directed review of available operational and oversight records, but cannot establish an elevated rate without operator flight exposure data or a verified shared mechanism.

Record discrepancies constrain some comparisons. The currently accessible C11 annual entry and detail page both report 25 deaths (1001Crash, 2026a, 2026b, 2026). An earlier unconfirmed extract recorded 32; that alternate figure is therefore excluded from the principal fatality tally but is retained as an explicit sensitivity scenario. The Indonesian aircraft is described as ATR 42-512 on one secondary page but ATR 42-500 in the KNKT report; the latter designation is used for the official investigation context (Transportasi, 2026). For the Mandera aircraft, secondary material alternates between EMB-120ER and Embraer 120RT, which does not change the event coding (1001Crash, 2026).

Using the currently supported 25-person C11 count, the 11 site records collectively describe 312 occupants, 75 occupant deaths and five reported ground deaths, equivalent to 80 reported fatalities in total. Substituting the unconfirmed 32-person C11 figure would produce 319 occupants and 82 occupant deaths, or 87 total fatalities; this is a hypothetical arithmetic sensitivity result, not a verified range. LaGuardia injury counts vary between the secondary narrative and the official summary, so no aggregate injury estimate is presented (1001Crash, 2026; Board, 2026).

A separate sensitivity check excludes the military case, leaving ten records: $\frac{T17}{10}$, $\frac{T26}{10}$, $\frac{T34}{10}$, $\frac{T43}{10}$ and $\frac{T57}{10}$. The interpretation remains a selected group of diverse operations, because the remaining cases still include maritime surveillance and freight movements. Uneven account length can influence theme coding, so frequencies are best understood as narrative coverage rather than rates of hazard occurrence.

The co-occurrence counts provide a further caution against interpreting marginal frequencies alone: five cases with an approach/landing event also mention some survivability or external-harm feature, yet the absence of T1–T4 co-occurrence mainly reflects which emergencies and access challenges were described in the selected stories. Neither pattern establishes statistical dependence or independence.

5.7 Implications for aviation safety research

Five research directions follow from the documentary findings. First, multi-factor approach-and-landing simulations could investigate combinations of terrain clearance, stopping margin, aircraft system availability and runway access coordination. Second, recorder and surveillance studies could distinguish failed equipment from incomplete or inconsistent operational information. Third, geographical analysis could test the completeness of diversion-site inventories and the feasibility of rescue access to offshore or remote impact areas. Fourth, future accident registers should record occupant and ground consequences separately, including injury, evacuation, rescue and fire. Fifth, final official investigation findings could be used to revisit the provisional semantic codes and determine how early narrative themes change as new evidence emerges.

For operational translation, a future multisite study could predefine a standard extraction form with case date, phase of flight, runway or terrain setting, navigation and aircraft-system status, relevant meteorological observations, air–ground coordination records, viable diversion sites, geospatial access constraints and separate occupant/ground harm outcomes. Where available, final investigation determinations and operator exposure denominators would allow independent testing of associations; the present coding structure alone cannot support an intervention effectiveness claim.

6. Limitations

The corpus is a small year-to-date selection from a single secondary aviation website; neither its completeness nor its selection rules are demonstrably representative of global accident occurrence. Several cases lack uniform independently accessible investigation records. Secondary narratives differ in specificity and can change after publication. Consequently, source mention frequency is vulnerable to reporting detail and cannot be interpreted as the prevalence or causal contribution of technical, environmental, operational or organisational factors.

7. Conclusion

Exploratory analysis of eleven 2026 accident narratives yielded five recurrent themes: approach and landing hazard interfaces, reported technical anomalies, reliable shared operational information, emergency options conditioned by geography and infrastructure, and survivability or harm beyond the aircraft. Approach/landing and survivability-related material each appeared in seven cases (63.6%); technical anomalies in six (54.5%); and information coordination and emergency-access constraints in four each (36.4%). These findings describe the reporting coverage of a selected documentary corpus and neither identify accident causes nor estimate population-level safety risk.

The case matrix nevertheless demonstrates the practical value of separating flight-phase context, reported equipment conditions, information-sharing interfaces, emergency geographical constraints and human consequences. A more mature assessment requires a larger systematically defined corpus, verified accident investigation findings, consistent casualty definitions and appropriate flight-exposure measures. The current framework offers an auditable starting point for that follow-up work while preserving the uncertainty inherent in preliminary aviation accident reporting.

Use of artificial intelligence

AI-assisted tools supported the exploratory documentary coding and linguistic preparation.

Data availability

The material analysed consists of publicly accessible 1001Crash accident entries and the supplementary official investigation materials cited below. The complete case register, semantic codebook, thematic matrix and coverage counts are included in Tables 1–4. No confidential aviation records or additional primary datasets were obtained.

Research ethics

This study analysed publicly accessible documentary accounts and involved no direct recruitment or intervention with human participants.

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