ALG JSAIT Go-Around Decision Map Narrative

INFLUENCING FACTORS

ATC

Air Traffic Control (ATC), Air Navigation Service Provider

Active

Factors directly introduced by and/or controllable by the flightcrew.

Traffic Separation

ATC separation procedures on approach to maximize the arrival rate, reducing delays to inbound aircraft. Flightcrews may experience higher approach speeds, time pressure to clear the runway, and an increased risk of go-arounds if preceding traffic has not cleared the runway.

Late Runway Change

ATC initiates a runway change within 5 miles of the final approach fix (FAF). Flightcrews may experience high flightdeck workload and distractions when reprogramming the flight management computer (FMC) and briefing the approach to the new runway.

Observation of Wrong Alignment

Radar and visual ATC monitoring may detect aircraft approaching the wrong runway or a taxiway.

Short Vectors

ATC issues short vectors that have an aircraft join the final approach course near the FAF. Flightcrews may experience challenges managing the energy state of the aircraft, leading to an unstable approach (UA).

Maintain Higher Than Expected Speed to the FAF

ATC may require higher than normal speeds on approach to maximize the arrival rate, reducing delays to inbound aircraft. Flightcrews may experience challenges meeting the stabilized approach criteria.

Passive

Factors introduced that are uncontrollable by the flightcrew, or a person is unaware that a latent human factor is present (for example, fatigue).

Reluctance To Question Unstable Approach Indicators

Overreliance on flightcrew to correct a UA, even if cues indicate the approach may be unstable.

Departure/Arrival Rate (Flow/Procedures)

Sustaining high departure/arrival rates introduces ATC time pressure and requires minimum spacing/higher approach speeds/close-in vectors on approach, increasing the likelihood of a go-around.

Visual Approach Clearance

ATC issues a visual approach, which changes the flightcrew dynamics in managing aircraft energy state and establishing/maintaining stable approach criteria. Flightcrews may accept clearance to expedite arrival by reducing required separation.

Emergency

ATC may issue instructions in response to a facility/aircraft emergency, which introduces unplanned factors that flightcrews must accommodate, creating last-minute changes to planned protocols.

Flightpath Management

"Automation" includes autopilot, autothrust, and flight management systems (FMS).

Automation Used/Managed Correctly

Flightdeck automation used in accordance with company policy/training.

Automation Not Used

Flightcrew elects not to use flightdeck automation.

Automation/Mode Confusion

Flightcrew confusion over a flightdeck automation function or how a function responds to flightcrew input.

Wrong Automation Chosen

Flightcrew chooses a flightdeck automation function that is inappropriate for the given situation.

Environment

Factors related to the states and circumstances that influence flight operations and air traffic management, including air traffic and aerodrome infrastructure, airspace factors, weather, and the like.

System Design

Factors related to the infrastructure features of the environment setting, such as airport or aircraft design, navigational coverage, or characteristics of a system.

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Aerodrome

Factors related to the presence of constructed tangible and intangible objects in the airport environment (for example, buildings, terminals, pavement, runways, taxiways, fixes, traffic pattern, and operational runway configuration changes), specifically excluding aircraft and ATC equipment.

Taxiway Geometry

Taxiway design that may contribute to missed runway exits or inadvertent runway entry, leading to conflict with arriving aircraft.

Airport Runway Geometry

Runway layouts that may cause flightcrew misidentification on approach (misalignment) or at intersecting runways.

Terrain Features/Obstruction (Influences on an Unstable Approach)

Natural features and man-made structures that may cause airspeed fluctuations/turbulence during approach and landing, leading to a UA.

Runway Contamination

Ice, slush, snow, and standing water on a runway that may cause increased stopping distance, leading to conflict with arriving aircraft.

Aircraft

Factors that involve aircraft and aircraft systems.

Flightdeck Design Issue

Factors related to flightdeck ergonomics that influence the flightcrew's ability to process information and actions.

Uncommon/Confusing Equipage Location

Physical layout of flight controls, instruments, avionics, buttons/switches, or space constraints that may contribute to erroneous selection or inadvertent activation of an incorrect/undesired function.

Unfamiliar Flightdeck

Issues arising from the flightcrew's lack of familiarity/recent experience/knowledge of a flightdeck.

National Airspace System (NAS)

Factors pertaining to the specific dimensions and/or boundaries of the airspace through which aircraft traverse. The NAS consists of the overall environment for the safe operation of aircraft that are subject to the Federal Aviation Administration's (FAA) jurisdiction. It includes air navigation facilities, equipment, and services; airports or landing areas; aeronautical charts, information, and services; rules, regulations, and procedures; technical information; and manpower and material. The NAS also includes system components used by the U.S. Department of Defense (DOD).

Complex Airspace Design

Airspace designed to protect aircraft from terrain, obstacles, or adjacent/underlying airports/special use airspace that may contribute to a high aircraft energy state because of late descent, short vectors, or minimum aircraft separation.

Complex Arrival Procedure

Airspace arrival procedures that involve multiple waypoint altitude/airspeed crossing restrictions, runway-dependent transitions, complicated navigational procedures, or late "as assigned by ATC" instructions that may affect flightcrew planning and contribute to confusion/distraction, resulting in a UA.

Unfamiliar/Uncommon Approach Procedure

Factors that may lead to flightcrew confusion/distraction and result in a UA, such as an approach type rarely flown by flightcrews, a common procedure with unusual factors, or an infrequently used approach to an airport.

Complex Missed Approach Procedure

A missed approach procedure with complicated factors, including low-altitude level-off, multiple or immediate turns, or other factors that increase flightcrew workload and may result in navigational errors and/or undesired aircraft states. The complexity of the procedure can add to pilot workload at a critical stage.

Weather

Factors related to the environmental conditions, weather, or other phenomena.

Wind Gust/Wind Shear

Airspeed/flightpath fluctuation may result in difficulty meeting stable approach criteria.

Tailwind

Increased potential for a high aircraft energy state, difficulty meeting stable approach criteria, and risk of runway overrun.

Crosswind

Increased potential for abnormal runway contact (ARC), risk of runway excursion (RE), and the aircraft encroaching the protected airspace of parallel runways during approach and go-around.

Visibility

Restricted visibility during approach may cause misidentification of runways/taxiways (misalignment). Transition from instrument to visual cues may lead to the aircraft becoming unstable late in the approach. Transition from visual to instrument conditions during a go-around can increase the risk for spatial disorientation.

Thunderstorms/Convective Activity

Associated gusty winds and/or turbulence may make meeting stable approach criteria difficult. Deviating around storm cells on or near the approach course may place the aircraft in an unusual position or energy state. The flightcrew may decide not to execute a go-around because of cells near the departure end of the runway or rapidly approaching the airport.

Policy/Procedures

Factors related to an Air Operator Certificate (AOC) holder's organizational oversight, support, and monitoring of organization programs, policies, and personnel.

Operator

Factors related to an AOC holder's organizational culture, go-around policy, training, and reporting requirements.

Organizational Culture

Organizational culture includes standard operating procedures (SOP), pressures, or demands from the company to perform or meet operational goals and timelines, as well as organizational structures and policies affecting the working environment and safety practices.

Go-Around Policy

Go-around policies and procedures set forth by the company/organization that set/influence a pilot's actions.

Flightcrew Training

Factors related to an operator's training program that influence the flightcrew's behavior/actions.

Reporting Requirement

Factors related to an operator's reporting requirements for go-arounds, or lack of reporting requirements, and how those factors impact and influence the flightcrew's behavior/actions.

Management Engagement

Factors related to management promotion, oversight, and support (or lack thereof) of an operator's safety program, related policies and procedures, and safety data monitoring to support operational/training enhancements based on observed performance.

Regulator

National civil aviation oversight bodies.

Complex Navigational Procedure Design/Criterion

Policies and procedures for development/redesign of navigational procedures and complexity of airspace/procedures contributing to flightcrew operational performance.

Training Requirement

Regulatory training requirements and their influence on an operator's policy and training programs for flightcrews.

Regulation

Regulations and their influence on aircraft systems design and operational requirements, as well as the impact those regulations have on flightcrew performance and decision making.

Advisory Material

Effectiveness of advisory material (or other similar documents issued by regulators/operators) in relaying critical information to flightcrews.

Pilot/Flightcrew

Factors related to pilots, flight engineers, or flight navigators assigned to duty in an aircraft during flight.

Active

Factors directly introduced and/or controlled by the flightcrew.

SOP Compliance

Flightcrew compliance with operator SOPs. Noncompliance may be influenced by cultural factors, experience, inadequate training, or disregard.

Aircraft Configuration

The flightcrew's incorrect or late configuration of aircraft flight control surfaces.

Wake Avoidance

Maneuvers performed by flightcrews to avoid wake turbulence from a preceding aircraft, which may create challenges in meeting stable approach criteria. Factors may include flying above glideslope or a lateral offset from the approach course. Flying above glideslope may place the aircraft in a high energy state (if excessively high) or increase the risk of a long landing/risk of a runway overrun.

Approach Compression

High aircraft arrival rates may result in ATC assigning higher airspeeds to the FAF and/or applying minimum possible in-trail spacing on final to accept the maximum possible number of aircraft. Higher airspeed to the FAF may make meeting stable approach criteria difficult, and minimum spacing increases the chances of a go-around if a preceding aircraft has not cleared the runway.

Decision Criteria To Initiate a Go-Around

Factors influencing the flightcrew's formulation and execution of a decision. These factors include regulations, SOPs, flightcrew training, and stable approach criteria.

Lack of Visual Contact

Flightcrew is unable to make or maintain visual contact with runway/airport environment or preceding aircraft.

Runway Length/Condition

Runway length/condition influencing the flightcrew's decision to continue landing or to execute a go-around. The flightcrew may be more likely to continue an approach to a long/dry runway and to perform a go-around to a short/contaminated runway.

Still Safe To Land

Factors influencing the decision to continue landing despite exceeding stable approach criteria or failing to comply with SOPs, such as the flightcrew's prior general experience, familiarity with the airport, or experience with the aircraft type.

Safer on the Ground

Factors influencing the flightcrew to conclude a continuation to landing is safer than a go-around, despite the knowledge that the SOP would require a go-around in that situation. Some factors may include aircraft fuel state, weather on the go-around track or rapidly approaching the airport, or proximity to traffic on intersecting/parallel runways.

Passive

Factors introduced that are uncontrollable by the flightcrew, or a person is unaware that a latent human factor is present (for example, fatigue).

Fatigue

Factors related to both mental and physical fatigue that lead to diminished productivity, alertness, or efficiency.

Landing/Continuation Bias

A general mindset that a landing is the outcome of an approach despite the presence of adverse conditions that may make a go-around a safer outcome.

Time Pressure

Operational or personal factors that introduce a rushed mindset. These may include operational schedule, mental fatigue influenced by a long workday or a long flight, weather, aerodrome restrictions (such as an operational or nighttime curfew), flightcrew connections, duty time limits, or personal commitments.

Reluctance To File a Report

Flightcrew reluctance to report a go-around regardless of operator requirements. Factors may include complex/time-consuming reporting systems, the belief that a go-around report may negatively impact the flightcrew, or a general reluctance to filing reports because of a lack of perceived risk/significance of an event.

Reluctance To Say "Unable" to ATC

Factors influencing the flightcrew to accommodate ATC instructions, even when doing so creates high/unmanageable flightcrew workload or leads to exceeding stable approach criteria.

Lack of Training (General Aviation (GA) Above Decision Height/After Touchdown)

Lack of adequate go-around scenario-based training for flightcrews, including the frequency of/lack of training on executing a go-around from other than the missed approach point.

In-Flight Emergency

An emergency that influences the flightcrew's decision process to continue to land irrespective of compliance to stable approach criteria.

In-Flight Warning (For Example, Terrain Awareness and Warning System (TAWS), Traffic Alert and Collision Avoidance System (TCAS), or Advisories)

A caution or warning generated by any aircraft system or other equipage that influences the flightcrew's decision process or planned actions for landing/executing a go-around.

Aircraft Systems Failure

A failure of any aircraft system or component that changes the flightcrew's decision to land/execute a go-around.

Fuel State

Minimum or emergency fuel state or any situation in which the flightcrew believes there may be inadequate fuel to accommodate a go-around.

DECISION MAKING

Go-Around NOT Executed

Factors related to UAs during which the flightcrew decided not to initiate a go-around before touchdown.

Uneventful Landing

The flightcrew continues the approach to a normal landing as defined by regulation, SOP, landing stability criteria, or any other requirement.

Undesired Aircraft State

An undesired aircraft attitude, energy state (high or low), and/or configuration—whether resulting from an external force or flightcrew action/inaction—that places the aircraft outside of the expected operational envelope, compromising safety.

Wrong Surface Alignment/Landing

An occurrence in which an aircraft is lined up with the incorrect landing surface (runway or taxiway).

Abnormal Runway Contact (ARC)

As defined by the Commercial Aviation Safety Team (CAST) International Civil Aviation Organization (ICAO) Common Taxonomy Team (CICTT), any landing or takeoff involving abnormal runway or landing surface contact. Includes hard/heavy/bounced landings, long/fast landings, off-center landings, crabbed landings, nosewheel-first touchdowns, tail strikes, wingtip/nacelle strikes, or touchdown off the runway surface (also known as an undershoot).

NOTE:

- Long/fast landings may be associated with the Landing Stability Exceedance, Excessive Flare/Float (see below).
- Off-center landings and crabbed landings may be associated with the Landing Stability Exceedance, Excessive Drift (see below).
- Nosewheel-first touchdowns and tail strikes may be associated with the Landing Stability Exceedance, Excessive Pitch (see below).

Runway Excursion (RE)

As defined by CICTT, a veer off or overrun off the runway surface—

- *Overrun*: an RE during which the aircraft departs the end of a runway.
- *Veer Off*: an RE during which the aircraft departs the side of a runway during landing, including intentional maneuvers to avoid an overrun.

NOTE:

- Overruns may be associated with the Landing Stability Exceedance, Excessive Flare/Float (see below).
- Veer offs may be associated with the Landing Stability Exceedance, Excessive Drift (see below).

Loss of Control-Ground (LOC–G)

As defined by CICTT, loss of aircraft control while the aircraft is on the ground.

Runway Incursion (RI)

As defined by CICTT, any occurrence at an aerodrome involving the incorrect presence of an aircraft, vehicle, or person on the protected area of a surface designated for the landing and takeoff of aircraft.

Approach Stability Exceedances

These definitions are from the Aviation Safety Information Analysis and Sharing (ASIAS) Approach and Landing Accident Reduction (ALAR) (Unstable Approach) dashboard, available at asias.aero.

- *Instrument Landing System (ILS) Above Glideslope*: more than one dot high for 5 seconds
- *ILS Below Glideslope*: more than one dot low for 5 seconds
- *Localizer Deviation*: more than one dot left or right for 5 seconds
- *High Speed*: greater than reference landing speed (Vref) + 20 knots for 3 seconds
- *Low Speed*: less than Vref for 3 seconds
- *High Rate of Descent*: greater than 1,000 feet per minute for 3 seconds
- *Low Thrust*: N1 35 percent for 5 seconds; N1 less than fifth percentile by fleet type
- *Ground Proximity Warning System (GPWS) Alert*: any GPWS alert
- *Late Flap Extension*: any flap movement more than 2 degrees
- *Late Gear Extension*: any gear movement
- *Speed Brakes*: any deployment of speed brakes
- *Unstable Yaw*: standard deviation in yaw rate greater than 1.25
- *Unstable Pitch*: pitch greater than 15 degrees for 3 seconds; standard deviation in pitch rate greater than 1.25

- *Unstable Roll*: roll greater than 40 degrees for 3 seconds; standard deviation in roll rate greater than 3.5

Landing Stability Exceedances

- *Excessive Flare/Float*: Landing flare or float conditions that lead to landing beyond the touchdown zone, defined as a point 500–3,000 ft beyond the runway threshold not to exceed the first one-third of the runway (Advisory Circular (AC) 91–79A, Mitigating the Risks of a Runway Overrun Upon Landing). Excessive flare/float events are associated with an increased risk of RE and ARC.

- *Excessive Drift*: An aircraft flightpath during landing that causes the aircraft to diverge from the runway centerline or heading to the extent that it is at an increased risk of ARC or an RE.

- *Excessive Pitch:* Aircraft pitch attitudes during landing that put the aircraft at an increased risk of a tail strike, nosewheel-first touchdown, or other ARC.

Go-Around Executed

Factors related to go-arounds executed by the flightcrew upon deciding not to continue an approach, or not to continue landing, usually followed by procedures to conduct another approach or divert to another airport.

Executed as Expected

The flightcrew executes a go-around in a situation as required by a regulation, SOP, stable approach criteria, or any other requirement.

Undesired Aircraft State

An undesired aircraft attitude, energy state (high or low), and/or configuration—whether resulting from an external force or flightcrew action/inaction—that places the aircraft outside of the expected operational envelope, compromising safety.

Loss of Control-Inflight (LOC–I)

As defined by CICTT, loss of aircraft control while, or deviation from intended flightpath, in flight. LOC–I is an extreme manifestation of a deviation from intended flightpath. The phrase “loss of control” may cover only some of the cases during which an unintended deviation occurred.

Controlled Flight Into or Toward Terrain (CFIT)

As defined by CICTT, in-flight collision or near collision with terrain, water, or obstacle without indication of loss of control.

Near Midair Collision (NMAC)

As defined by CICTT, air proximity issues, TCAS/airborne collision avoidance system (ACAS) alerts, loss of separation, and near collisions between aircraft in flight.

Navigation Errors (NAV)

As defined by CICTT, occurrences involving the incorrect navigation of the aircraft on the ground or in the air. Includes lateral navigation errors caused by using the improper navigational aid (NAVAID) or improperly programming aircraft navigation systems and deviating from ATC clearances or published procedures (standard instrument departure/departure procedures (SID/DP), Standard Terminal Arrival Route (STAR), approach procedures, or charted visual procedures).

Airspeed Low Relative to Stall Speed

Airspeed less than 1.3 of the stall speed for a given aircraft configuration.

Weather Hazards (WSTRW)

As defined by CICTT, flight into wind shear or thunderstorm.

Failure To Activate TOGA Mode/Throttle Movement (Airbus vs. Boeing)

Failure to press the go-around button in Boeing aircraft or failure to move thrust levers to takeoff/go-around (TOGA) detent in Airbus aircraft.

Aircraft Exceedances

- *Flap Speed Exceedance*: maximum flap extended speed (Vfe) for the aircraft and flap setting
- *Gear Speed Exceedance*: maximum airspeed for operating with landing gear extended (Vle)/maximum airspeed for extending or retracting the landing gear (Vlo) for the aircraft
- *Excessive Pitch Attitude*: pitch exceeding +15 degrees
- *Excessive Roll Attitude*: bank angle exceeding 40 degrees
- *Minimum Calibrated Airspeed (CAS) Relative to Stall Speed*: aircraft specific depending on configuration and load factor
- *Speed Decay*: aircraft specific
- *Stall Warning*: stall warning activation, including momentary
- *Enhanced Ground Proximity Warning System (EGPWS) Activation*: all EGPWS cautions/warnings, including momentary
- *Dual-Command Input*: simultaneous inputs to both sidestick controllers (Airbus specific)
- *Altitude Overshoot During Level-Off*: altitude overshoot exceeding 200 feet
- *Descent After Gear Retraction*: any rate of descent detected after gear retraction