

FPAC

Flight Planning Automation Checker

User Guide

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Systematically identify, analyse and reduce planning inefficiencies on short-haul flights.

Flight Support · Swiss International Air Lines

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1. Overview

FPAC (Flight Planning Automation Checker) is a tool developed for Swiss International Air Lines that automatically detects planning inefficiencies on short-haul flights. It comprises two modules:

- **Pre-Flight Check** — Real-time review of filed flights prior to departure (for dispatchers)
- **Post-Flight Analysis** — Retrospective analysis over 30 days to identify recurring patterns (for Flight Support)

FPAC evaluates every short-haul flight against 7 categories and flags deviations. Dispatchers can review flagged flights in real time and report them to Flight Support. Flight Support analyses recurring patterns and creates suppression rules for known exceptions.

2. The 7 Analysis Categories

FPAC distinguishes two groups of categories:

Suboptimally Planned

■ Distance > P70

The filed or planned route is longer than the 70th percentile of all flights on the same city pair. In other words, 70% of flights on this route fly an equal or shorter distance.

■ Unusual Route

A backup or infrequently used route was filed despite more common, shorter alternatives being available.

■ Unusual FL

The flight level is more than 4,000 ft lower than the usual FL for the same aircraft type on the same route.

■ Dispatch Change

The optimal route was changed after initial filing, typically due to slot management or ATC flow restrictions.

Additional Categories

■ Inefficient Segment

A specific segment of the route is longer than on comparable flights using the same waypoints.

■ FL Steps

Low flight levels (below FL200) at the beginning or end of the flight that may not be operationally necessary.

■ OPT Inefficiency

The optimised segment (OPT) deviates more than 110% from the great circle distance, indicating the optimiser did not find an efficient solution.

3. Pre-Flight Check

The Pre-Flight Dashboard displays all planned short-haul flights for the day using a traffic light system:

- **Red** — Check immediately: a significant deviation has been detected
- **Yellow** — Monitor: a moderate deviation that may be relevant
- **Green** — No issues: no relevant deviation identified

Key Features

- **Crew Check-In Countdown** — Displays remaining time until crew check-in. Turns red when less than 15 minutes remain.
- **Route Overview** — A collapsible map showing all flights from ZRH. Red routes prominent, green routes subtle.
- **Next Check-In** — The refresh bar highlights the most urgent flagged flight and its remaining check-in time.
- **Expand View** — Click the chevron to reveal comparison cards (reference vs. this flight) and a button for the full route map or FL profile.
- **Anomaly Day** — When more than 30% of flights are flagged, a banner appears with the option to mark the day as special (strike, weather, ATC).

Actions per Flight

- **Acknowledge** — Confirms the flight has been reviewed and noted
- **Later** — Sets the flight aside for later. Can be directly acknowledged or reported from the "Review later" tab
- **Report** — Reports the flight to Flight Support. Appears in Post-Flight under "Reported Flights"

All actions are logged with username and timestamp. Any action can be reversed using the undo button.

4. Post-Flight Analysis

The Post-Flight Dashboard is designed for Flight Support and presents a comprehensive analysis of the last 30 days.

Dashboard Structure

- **KPI Bar** — Flights analysed, flagged flights, cumulative excess distance (NM), and estimated savings (kg fuel / CHF).
- **Top Outliers** — Recurring patterns sorted by impact. Click to open route map and filter the detail table.
- **Category Filter** — Quick-filter chips for each of the 7 categories with count per category.
- **Detail Table** — All flagged flights with expandable rows, comparison data, and filing status badges (Filed / Planning Only).
- **Extended Analysis** — Behind a toggle: stacked bar trend chart (day/week/month), category sidebar with trend indicators, and an independent period selector.

Tabs

- **Flagged Flights** — Main view with outlier patterns, category filters, and the detail table
- **Reported Flights** — Flights reported by dispatchers. Flight Support decides: create rule or dismiss
- **Special Days** — Days marked as exceptional by dispatchers (ATC, strikes, weather)
- **Suppression Rules** — Management of active rules (see Chapter 5)

Time Period

The main view defaults to 30 days. A custom range can be selected via "Select period". The extended analysis has its own independent period selector (14d / 30d / 90d / custom), allowing comparison across different time windows.

5. Rule Management

Suppression rules prevent known exceptions from being repeatedly flagged. They apply to both Pre-Flight and Post-Flight dashboards.

Creating a Rule

- **Name** — A descriptive identifier (e.g. "ZRH-VIE FL280 A320 expected")
- **Route Pair** — The applicable city pair (e.g. ZRH-VIE)
- **Category** — Which analysis category the rule should suppress
- **Condition** — Optional: additional criteria (e.g. "via KEMIX", "FL < 300", "A320")
- **Review Date** — Date on which the rule must be reviewed. Prevents permanent blind suppression.

Important Notes

- Rules suppress alerts but do not delete data — suppressed flights remain fully analysable
- On the review date, the rule is automatically presented for reassessment
- Rules can be exported and imported as JSON for backup or transfer
- Only Flight Support can create rules — dispatchers report, Flight Support decides

6. Route Map and FL Profile

For route-related anomalies (Distance > P70, Unusual Route, Inefficient Segment, OPT Inefficiency, Dispatch Change), FPAC displays a schematic route map with the European coastline:

- **Green dashed line** — P70 reference route (70% of flights use this or a shorter route)
- **Red solid line** — Filed or planned route, with waypoint labels at each turning point

For flight-level anomalies (Unusual FL, FL Steps), FPAC displays a route profile:

- Horizontal axis: waypoints along the route
- Vertical axis: flight level, with the FL200 threshold clearly marked
- Green dashed = usual profile, Red = this flight

7. Workflow: Pre-Flight → Post-Flight

The closed-loop workflow between dispatcher and Flight Support:

Step	Who	Action
1	Dispatcher	Reviews flights in Pre-Flight Check and identifies anomalies
2	Dispatcher	Clicks "Report" on relevant flights
3	Dispatcher	Clicks "Transfer to Post-Flight" in the report banner
4	Flight Support	Opens Post-Flight → "Reported Flights" tab
5	Flight Support	Reviews each report: "Create rule" or "Dismiss"
6	Flight Support	Creates a suppression rule with a review date if appropriate
7	System	Rule suppresses future alerts on both dashboards
8	Flight Support	Reviews and reassesses the rule on the review date

Fuel Savings Estimation

FPAC estimates savings potential using conservative assumptions:

- Approximately 3.5 kg of additional fuel per additional NM on short-haul flights
- Approximately CHF 0.75/kg Jet A1 (average price)
- **Example:** +24 NM per flight × 8 occurrences = +192 NM → ~672 kg → ~CHF 504

For questions or feedback: Flight Support · Swiss International Air Lines