

Globally secure, real-time peace of mind

Satellite Authorisation Systems (Pty) Limited

ADT solution presentation 2022

ICAO Asia/Pacific Region

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ADT solution motivation

A system which is always **ON**, so **NO** aircraft is ever lost again

- ▶ **Navigation**
 - ▶ Global coverage
- ▶ **Communication**
 - ▶ Overcome dependence on, and limitations of current onboard flight deck systems
- ▶ **Complete independence of ANY Aircraft systems**
- ▶ **System fit-for-PURPOSE**
 - ▶ Generic system for all aircraft types
 - ▶ Parameter fine-tuning specific to aircraft type



An ADT system should meet ICAO Annex 6 Part 1 6.18



Independent Location Data

Independent Ground Speed

Independent Bearing / Direction

Independent Altitude

Independently Powered – Always **ON**

Autonomous = Resilient to aircraft system failures

The ADT system

- Certified solution (EASA/FAA)
- Automated transmissions at **customisable** intervals
- GADSS/ADT messages transmitted and verified
 - Automated distress triggers
 - Manual distress triggers activated by:
 - Flight operations from the ground in real time
 - Flight crew in the aircraft
- **Exceeding 4D15 by including :**
 - Trigger information
 - Position reports transmitted at frequency exceeding every 15 sec
 - Altitude, bearing, HDOP accuracy, SBABS compliant and additional data
 - Aircraft state data
 - Supporting situational data encapsulated in the real-time transmission of the ADT instance
- Battery life should allow for the continued transmission of distress data for the duration of the remainder of the flight



EMERGENCY: AUTOMATIC POSITION REPORT

Sent: May 24, 2019 12:02:12 PM
 Sent UTC: 2019-05-24T10:02:12.047Z
 Recipients: RUR (RUR)
 Message Type: AutomaticPositionReport
 Position: 25°55.09'S 28°20.43'E 🚨
 Speed: 327 km/h
 Altitude: 2 438 m
 Heading: 273°
 Accuracy: DOP 3
 Location Source: Glonass

Aeroplane I D: ZS-SXD
 Aircraft State: 3
 Axis G X: 0
 Axis G Y: 0
 Axis G Z: -1
 Battery Voltage: 7.20
 Connection I D: [REDACTED]
 Csq: 5
 Emergency Type: 3
 Event Notification: 8d82e00a-6a1f-4cd6-8167-c7437f137052
 Alerts Triggered:
 Gps Quality: 1
 Hdop: 0
 Imei: [REDACTED]
 Pitch: 1
 Roll: -5
 Satellites: 8
 Temperature: 25
 Time Zone Id: South Africa Standard Time
 Trigger Cause: 1
 Yaw: 153

Data security

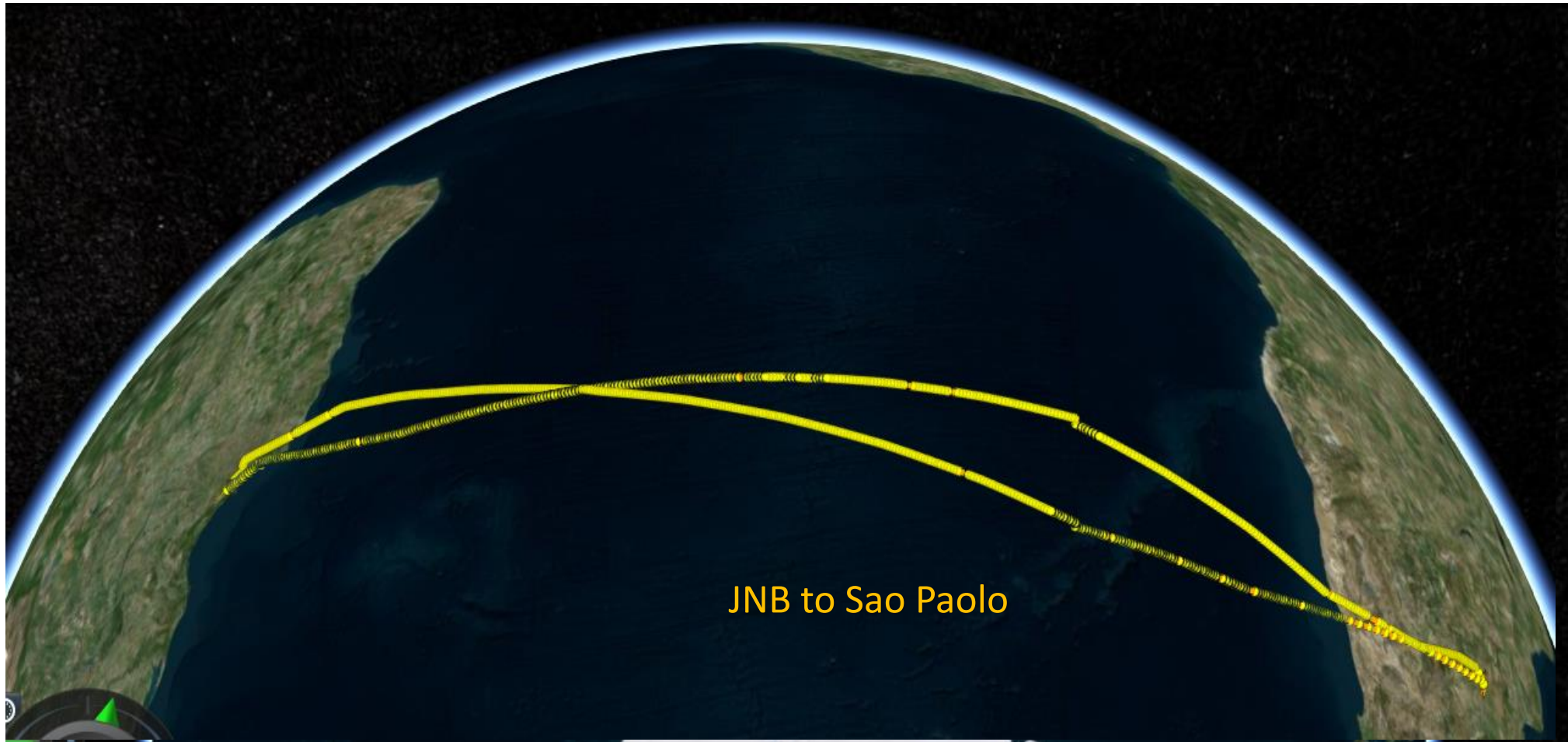
- All tracking data is owned by the Operator
- Access to the data is managed by the Operator
- Data is encrypted to AES (256-bit) and PCI3 standards
- Data is FIPS 140-2 compliant
- Customisable encryption can be additionally implemented
- All tracking data is available in real-time, and retained for further download and analysis
- Data is stored in secured scalable servers with built-in redundancy
- Data can be retained for up to 12 months
- Operator approved automated transmission of distress tracking data to the ICAO LADR



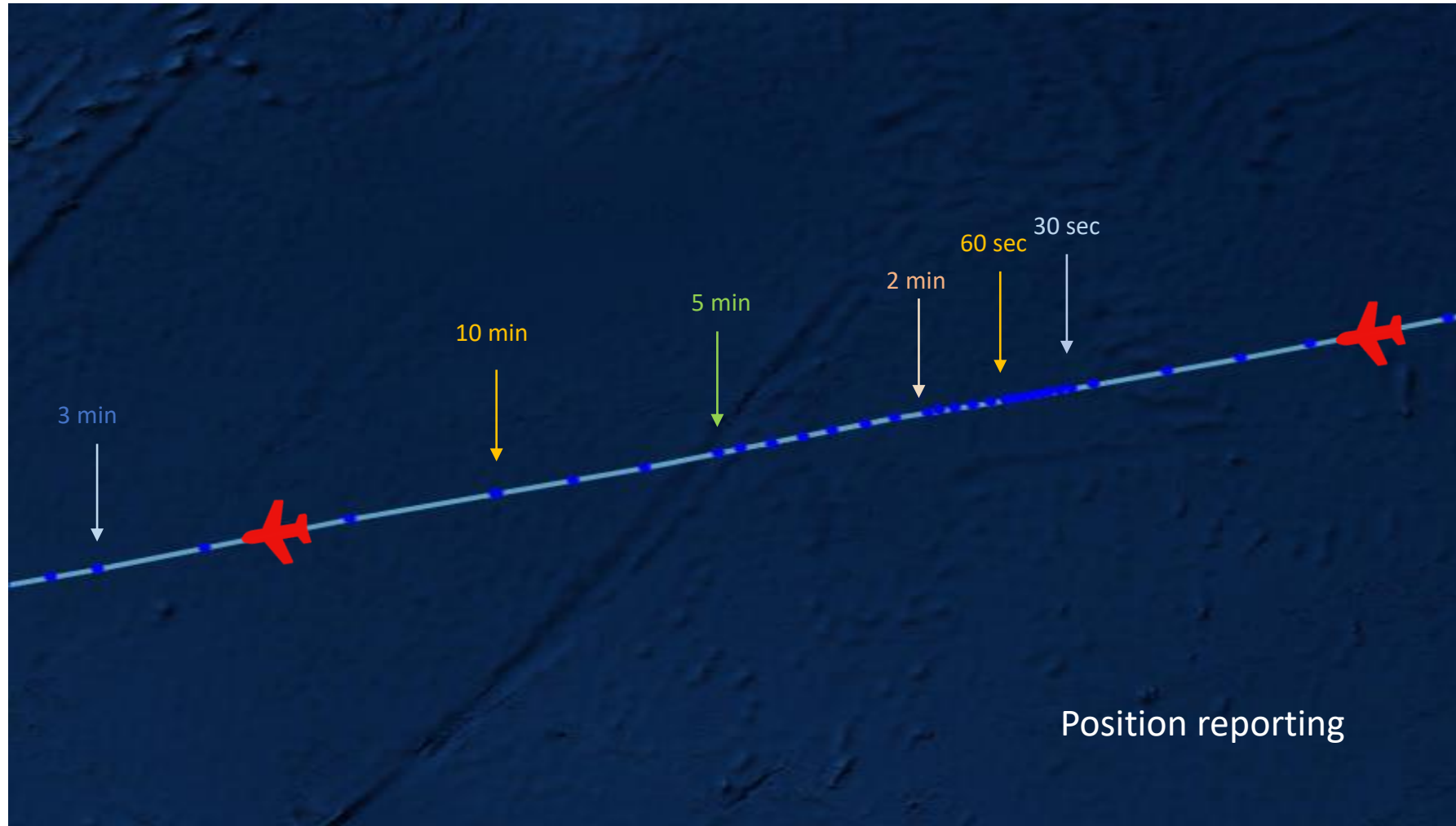
A screenshot of a data interface showing various aircraft tracking parameters. The data is presented in a list format with some fields redacted with blue bars. The parameters include aircraft ID, state, acceleration axes, battery voltage, connection ID, CSQ, emergency type, event notification alerts, GPS quality, HDOP, IMEI, pitch, roll, satellite count, temperature, time zone, trigger cause, and yaw.

| | |
|--------------------------------------|--------------------------------------|
| Aeroplane I D: | ZS-SXD |
| Aircraft State: | 3 |
| Axis G X: | 0 |
| Axis G Y: | 0 |
| Axis G Z: | -1 |
| Battery Voltage: | 7.20 |
| Connection I D: | [REDACTED] |
| Csq: | 5 |
| Emergency Type: | 3 |
| Event Notification Alerts Triggered: | 8d82e00a-6a1f-4cd6-8187-c7437f137052 |
| Gps Quality: | 1 |
| Hdop: | 0 |
| Imei: | [REDACTED] |
| Pitch: | 1 |
| Roll: | -5 |
| Satellites: | 8 |
| Temperature: | 25 |
| Time Zone Id: | South Africa Standard Time |
| Trigger Cause: | 1 |
| Yaw: | 153 |

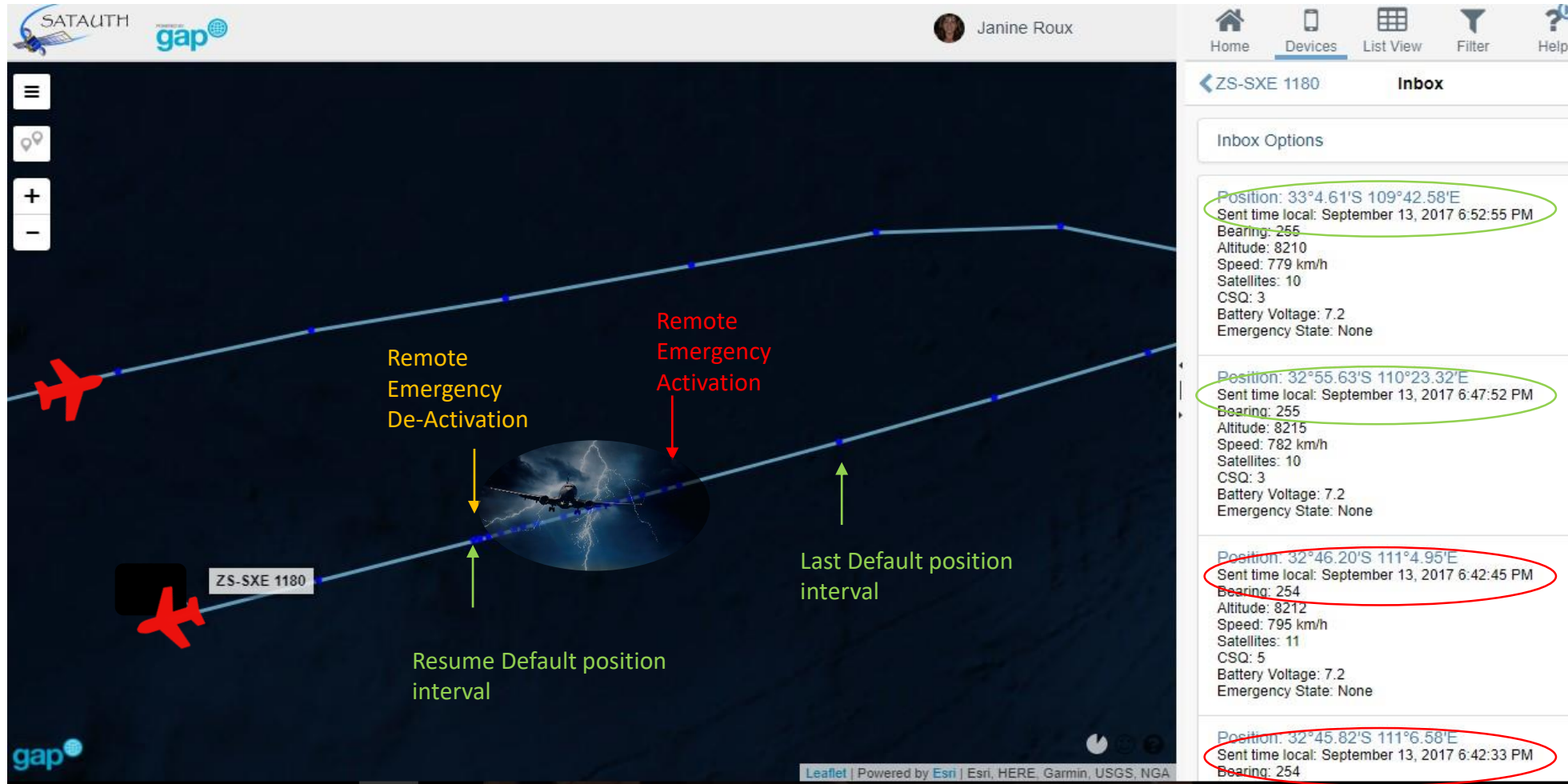
Worldwide Coverage



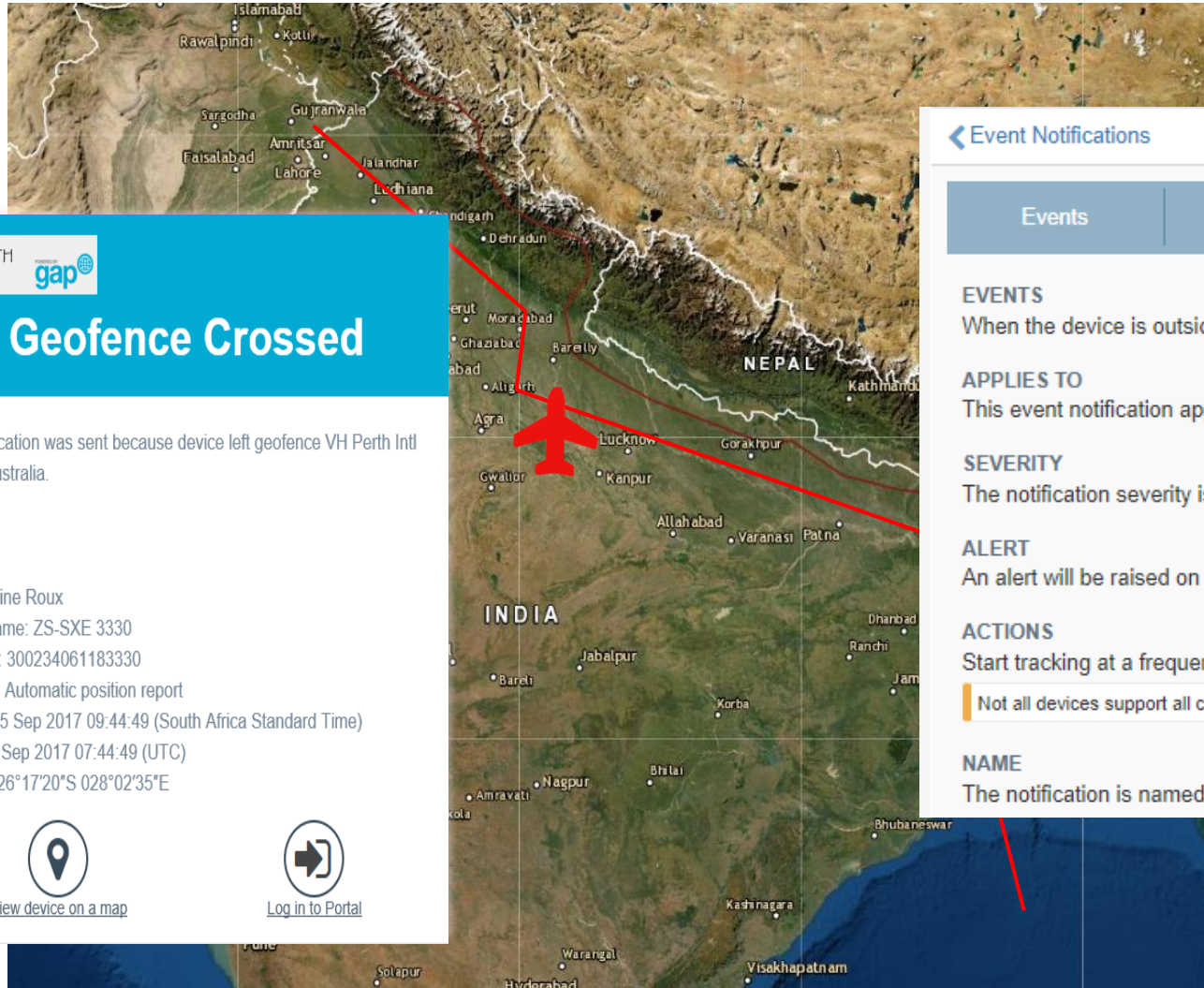
In-flight customisable aircraft tracking intervals



Emergency activation by terrestrial Operations



Warning Alerts



SATAUTH powered by gap

Geofence Crossed

The notification was sent because device left geofence VH Perth Intl Airport Australia.

Details

User: Janine Roux
Device name: ZS-SXE 3330
Device Id: 300234061183330
Message: Automatic position report
Sent at: 15 Sep 2017 09:44:49 (South Africa Standard Time)
15 Sep 2017 07:44:49 (UTC)
Position: 26°17'20"S 028°02'35"E



[View device on a map](#)



[Login to Portal](#)

Event Notifications

New Event Notification

| Events | Applies to | Actions | Name | Summary |
|---|---|--|---|---|
| EVENTS When the device is outside Alert Zone | APPLIES TO This event notification applies to all SatAuthV1 devices from tenant Satellite Authorisation | SEVERITY The notification severity is Info | ALERT An alert will be raised on the dashboard. | ACTIONS Start tracking at a frequency of 1 minute |
| <p>Not all devices support all commands, if a command is not supported by a device in the scope of the rule, it will not be sent.</p> | | | | |
| NAME The notification is named Asset is nearing Alert Zone | | | | |

ADT Solution response to GADSS ConOPs

| Requirement | |
|---------------------------------|--|
| Autonomous | Independent of all Aircraft systems : <ul style="list-style-type: none"> • Communications Power Navigation |
| Global Tracking | 100% Global Coverage |
| Tracking Intervals | Standard 4D15 (18 Nov 2018) <ul style="list-style-type: none"> • Can be customised on-the-fly to less than 60 sec intervals by Aircraft Operators ADT automated or manually activated since 2016 |
| Automated warnings | Situational warning alerts: <ul style="list-style-type: none"> • Geofence crossings , HotSpot / No-Fly zones Uncertainty, Alert and Distress states (customisable to Operators aircraft flight envelopes within OEM specifications) |
| ADT emergency | Algorithmic <i>in-flight</i> determination of the aircraft state Supportive read-only data from the FDR Automated or Terrestrial activation from Flight-Operations <ul style="list-style-type: none"> • activates high-rate tracking with additional aircraft state data • Initiates automated alerts • Initiates the population of the ICAO LADR with supporting event data |
| PEF (point-of-end-of flight) | Meets CAT.GEN.MPA.210 (AMC1) EASA Decision ED 2021/008/R when combined with aircraft existing ELT Location 6NM <200m 95% for PFLR (Post Flight Localisation and Recovery) |