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# ASIA PACIFIC CENTRE FOR AVIATION SAFETY

## AP-CAS – UPRT and Flight Path Management Projects

7 June 2024

# Upset Prevention and Recover Training

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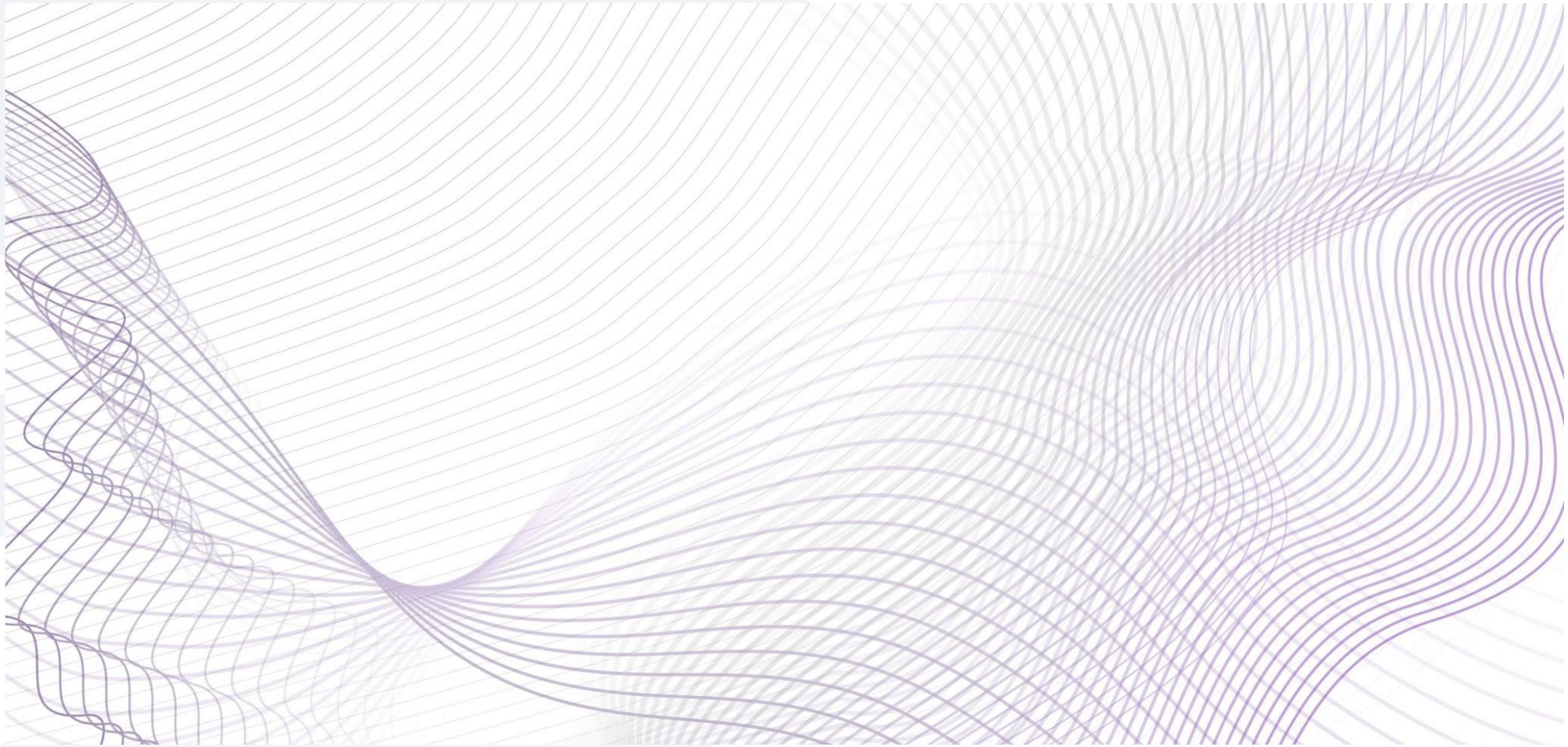

# AP-CAS UPRT Project: The Problem

- Loss of Control-Inflight (LOC-I)is a high-risk airline safety category;
  - In the APAC Region, LOC-I is the second highest fatal accident category (absolute number of accidents)
  - Over the past seven years, in the APAC Region, there were eight LOC-I accidents
  - Five of these were fatal with **333 fatalities** making LOC-I the most fatal accident type in the region
- Since 2011, ICAO, the FAA, and EASA have had several initiatives to address this issue – Upset Prevention and Recovery Training (UPRT)
- Of great importance was the 2014 ICAO publication of the “Manual On Aeroplane Upset Prevention And Recovery Training” **ICAO Document 1001**
- Also important are the UPRT licensing recommendations in ICAO International Standards and Recommended Practices, Annex 1, Personal Licensing and Annex 6, Part I – International Commercial Air Transport -- Aeorplanes

# AP-CAS UPRT Project: The Problem (cont.)

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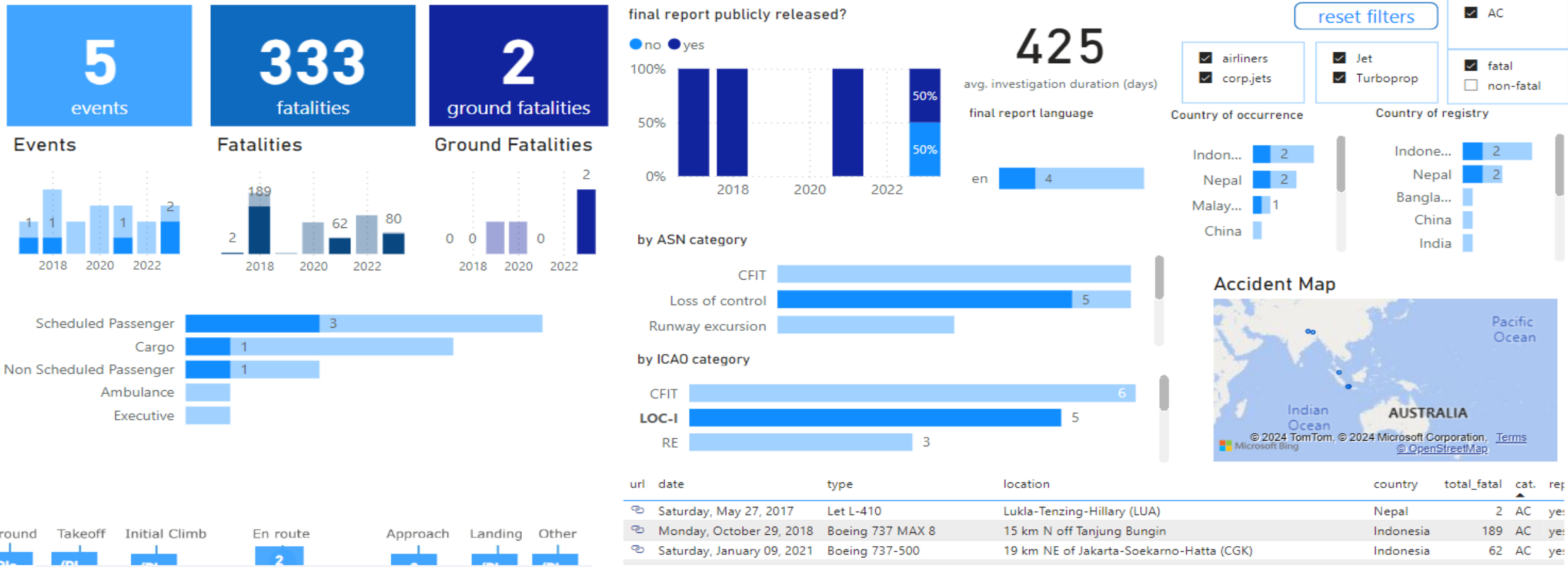
Flight Safety Foundation, Aviation Safety Network (ASN)

## APAC Accident Dashboard 2017-2023




| url | date | type | location | country | total_fatal | cat. | rep |
|---|---|---|---|---|---|---|---|
| | Saturday, May 27, 2017 | Let L-410 | Lukla-Tenzing-Hillary (LUA) | Nepal | 2 | AC | yes |
| | Monday, October 29, 2018 | Boeing 737 MAX 8 | 15 km N off Tanjung Bungin | Indonesia | 189 | AC | yes |
| | Saturday, January 09, 2021 | Boeing 737-500 | 19 km NE of Jakarta-Soekarno-Hatta (CGK) | Indonesia | 62 | AC | yes |

# AP-CAS UPRT Project: The Problem (cont.)

- The **ICAO Document 1001, includes:**
  - A detailed account of recommendations for UPRT academic training subjects, and practical flight maneuvers.
  - It also describes when these UPRT subjects and flight maneuvers should be provided to pilots and in what training media
    - Academic Training
    - On-aeroplane training for CPL (A)/MPL
    - Non-type-specific Flight Simulated Training Device (FSTD training) – for (CPL (A)/MPL)
    - Type specific FSTD training
- ICAO SARPs, Annex 1, Personal Licensing, provides States with UPRT provisions for licensing for CPL(A)/MPL
- ICAO SARPs, Annex 6, International Commercial Operations provides States and Airlines with training requirements for UPRT
- **So, this begs the question, are APAC airlines, associated ATOs and State Regulatory and Licensing Authorities incorporating these recommendations in their training and licensing programs?**

# UPRT Project Objective

- To evaluate the extent to which UPRT is currently integrated into the training curricula of flight crew members for initial, transition and recurrent airline training, as well as ab-initio training, across the region
  - Facilitate sharing of best practices
  - Identify any gaps
  - Develop evidence-based recommendations for enhancing UPRT implementation
  - Promote awareness among regulatory authorities, training organizations, airlines, and industry stakeholders about the importance of effective UPRT

# AP-CAS UPRT Project Scope

- The AP-CAS Project has four phases
- Each phase will have several desired accomplishments and an end-of-phase Milestone Report as a deliverable
- Phase 1
  - Develop a detailed implementation plan
  - Form a Focus Group,
    - invite the assistance of safety, training and proficiency assessment professionals from
      - ICAO Asia Pacific Regional Aviation Safety Team (APRAST)
      - Association of Asia Pacific Airlines (AAPA)
      - International Air Transport Association (IATA)
      - Flight Safety Foundation
      - ICAO Secretariat
    - Act as an advisory body
    - Assist the AP-CAS UPRT Team with identifying Asia Pacific Airlines, associated Approved Training Organizations (ATO) and associated Government Regulatory Safety Oversight Organizations for surveys
  - Perform a thorough literature research on UPRT recommendations and best practices

# AP-CAS UPRT Project Scope

- Phase 2
  - Use Focus Group to acquire training curricula and licensing criteria for pilots of APAC Airlines
  - Use this information to determine gaps of information
  - Use Flight Safety Foundation, AAPA, IATA and ICAO resources to ascertain the identification of specific APAC airline and Subject-Matter Experts (SMEs) who should receive surveys
  - Develop a survey strategy
  - Use small group tryouts on the surveys
  - Disseminate surveys
  - Collect survey data/information
  - Compile analysis Fact Sheets

# AP-CAS UPRT Project Scope

- Phase 3
  - Conduct Webinars to describe the analyzed results of the data/information collection and surveys
  - Use ICAO and Flight Standard resources to disseminate analyzed information
- Phase 4
  - Provide a final report that provides a complete description of the project, the methods used to collect UPRT data/information and the analyzed results from the data/information
  - Provide best practices that will hopefully make a positive difference in enhancing UPRT safety

# UPRT Outcomes and Benefits

By the end of this project, the analysis on the implementation of Upset Prevention and Recovery Training will result in

- A comprehensive report that highlights the strengths and weaknesses of current UPRT practices within the Asia Pacific region;
- Actionable recommendations and guidelines for enhancing UPRT effectiveness, contributing to the overall improvement of flight safety in the region.
- The results of the project and recommendations will be communicated to airlines, approved training organizations, and State regulatory authorities in the region.

Metric: Number of LOC-I Accidents and Serious Incidents in the Asia Pacific Region

# Flight path management training and procedures

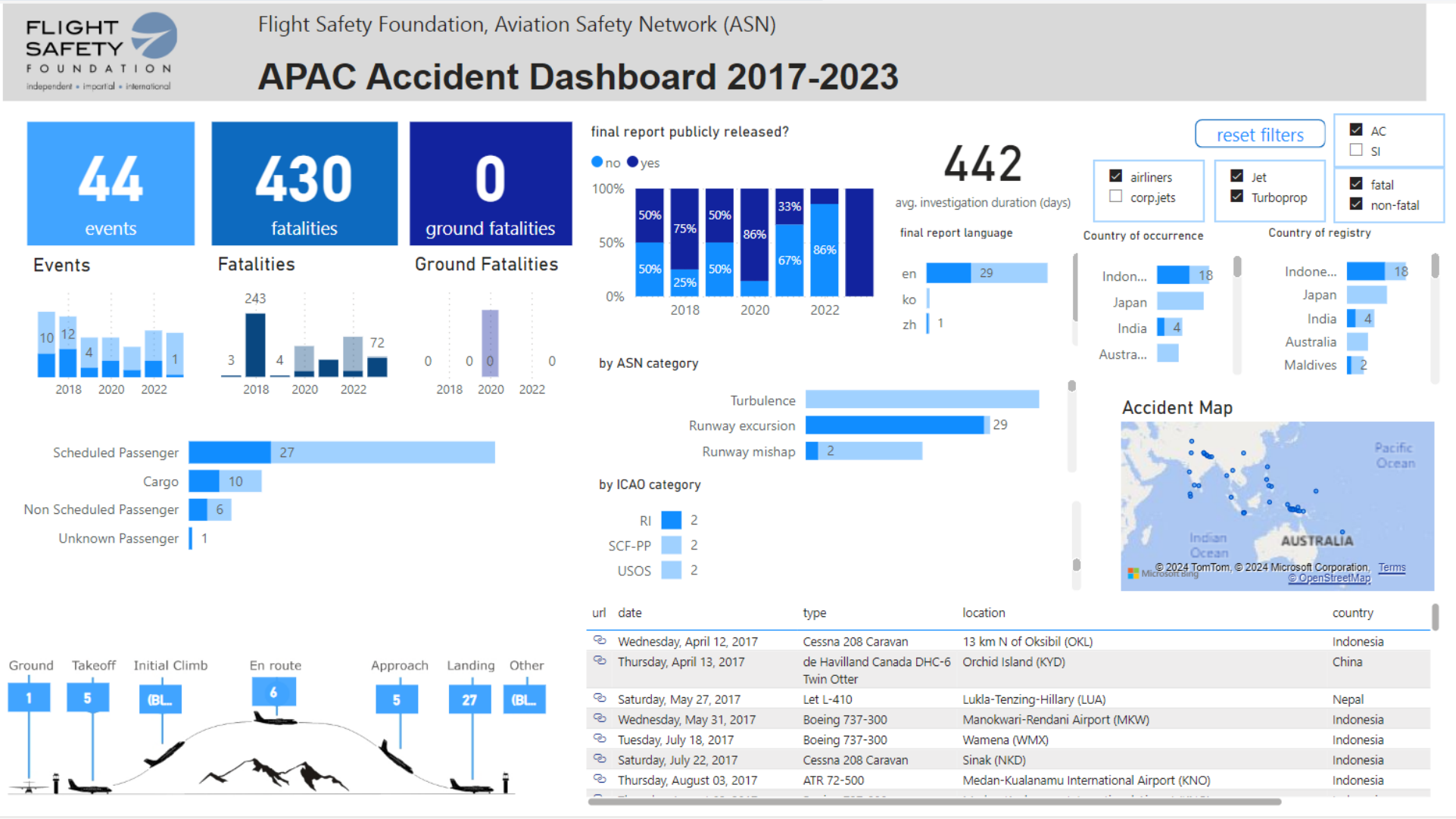
# Flight Path Management: The Problem

- Flight Path Management (FPM) is considered the control of the trajectory and energy of an aircraft in three dimensions by the flight crew.

- FPM includes:
  - manual flight
  - management of automated systems
  - energy management
  - Pilot monitoring

- Failure to correctly perform any of these functions will have consequences ranging from minor incidents to major accidents.

# Loss of Situational Awareness can Lead to:




- LOC-I
- CFIT
- Runway incursions
- Runway Excursions
- Etc.

# Flight Path Management: The Problem, (cont.)

There is substantial evidence that the training and evaluation environment for pilot license holders currently in use by regulators and operators in the region may be insufficient to ensure a level of basic airmanship  and mitigate the risk of automation competency by operating crews. Accident data would suggest that in many cases flight path management competency is thought to be a contributing factor to a wide range of accidents.

- **FPM is the subject of both training and procedures**
  - training should be considered from a student pilot's first flight until retirement from commercial service
  - This project should consider all aspects of a pilot's exposure to training in energy and trajectory control by manual means at every phase of a pilot's career.
- This project should also consider training in the use of all modes of automation as an aid to energy and trajectory control
- Normal Procedures and Operational standards should facilitate both automation use and management and proficiency in manual control

# Flight Path Management Reference Material

- As a starting point reference can be made to the ICAO requirements for a noncommercial private pilot license found at ICAO Annex 1, 2.3.1.3
  - recognize and manage threats and errors
  - operate the aircraft within its limitations
  - complete all manoeuvres with smoothness and accuracy
  - exercise good judgment and airmanship
  - apply aeronautical Knowledge
  - maintain control of the aircraft at all times in a manner such that the successful outcome of a procedure or manoeuvre is assured.
- These attributes are required to be maintained and reinforced at every stage of a pilot's career
- Additional guidance available from EASA and FAA

# FPM Project Objectives

- The objective of this project is to conduct a comprehensive analysis of the implementation of Flight Path Management (FPM) principles, training and operational procedures within the Asia Pacific aviation sector. The project will:
  - Review existing documentation from various sources on current best practices for both training and procedures
  - Review of the regional accident and incident data to establish a baseline for encouraging implementation of best practices where appropriate
  - Identify challenges and barriers to the implementation of such best practices
  - Provide tools for operators to identify gaps or variations from accepted best industry practice including barriers to implementation not common to the region
  - Outline actionable outcomes for operators, training establishments and regulatory agencies aimed at improving the FPM capabilities of flight crews generally

# Flight Path Management Project Objectives cont.

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- A major goal of the study will be to collect information on the adoption of FPM principles, procedures and training by States and the implementation of the training and procedures by the airlines and approved training organizations in the APAC Region.

- It will seek to answer the question:  Is the training and evaluation environment for airman certificate holders currently in use by regulators and operators in the region sufficient to ensure a level of basic airmanship and automation competency by operating crews?

# AP-CAS FPM Project Scope

- Four Phases of Development
- Each phase will have several desired accomplishments and an end-of-phase Milestone Report as a deliverable
- Phase 1 – Global Data Search
  - The project will begin by gathering information of worldwide regulatory, industry and academic best practices to allow for creation of metrics for the evaluation of FPM training and procedures.
  - A review of recent regional accident and incident data will be conducted to demonstrate the need for cooperation.
- Phase 2 – Regional Industry Information/Data Acquisition
  - Utilizing a focus group of aviation professionals from the region the project will seek to identify any challenges and barriers to implementation of the identified best practices that must be considered.
  - The focus group will also assist in the collection of data concerning the current regulations and procedures addressing FPM
  - Conduct Survey of airlines and ATOs to regional best practices

# AP-CAS FPM Project Scope

- Phase 3 – Analysis and Stakeholder Engagement
  - Data generated in the second phase will form the basis of an in-depth analysis of the current practices in the region
  - The project team will conduct Webinars to describe the analyzed results of the data/information collection and surveys
- Phase 4 – Report and Recommendations
  - Using data collected during the study, the project team will propose actionable outcomes for operators, training establishments and regulatory agencies aimed at improving the FPM capabilities of flight crews.
  - UPRT/FPM Focus Group will review the report and provide its comments prior to the finalization of the report

# FPM Project Outcomes and Benefits

By the end of this project, the analysis on the implementation of FPM training and procedures will result in a comprehensive report that highlights the strengths and weaknesses of current FPM practices within the Asia Pacific region. The report will offer actionable recommendations and guidelines for enhancing FPM training and procedural effectiveness, contributing to the overall improvement of flight safety in the region.

Metrics:

Outputs: Changes to training curricula, SOPs and testing criteria

Outcomes: Real time evaluation of pilot FPM skills (e.g., simulator checks, line checks, LOSA results)

# Rolls and Responsibilities FSF and AP-CAS

- FSF and it's AP-CAS takes overall responsibility for the projects
- AP-CAS Project Managers are responsible for:
  - All analysis work and documenting the results of the analysis
  - Coordination with the UPRT/FPM Focus Group including facilitating meetings and documenting the outcome of the meetings
  - Developing all workshop/webinar meetings
- FSF will handle all logistics for virtual meetings and "webinars", including drafting invitations
- Developing the final report

# AAPA Roles and Responsibilities

- Advise FSF on the strategies throughout the phases of each project
- Coordinate with member Airlines to:
  - Form the UPRT/FPM Focus Group
  - Communicate with member airlines to invite them to “Webinars” to solicit input from all Member Airlines (based upon FSF drafted invitation)
- Participate, to the extent possible, in meetings with Focus Group and in Webinars
- Review major deliverable and provide comments
- Occasional time commitment to review documents and coordinate with member airlines
- No direct financial commitment envisioned

# Flight Path Management/UPRT Focus Group
# Draft Terms of Reference


**Tasks:**

- Advise the UPRT and FPM Project teams on gathering information on APAC and worldwide regulatory, industry and academic best practices to allow for creation of metrics for the evaluation of UPRT and FPM training and procedures;
- Assist with the identification of any challenges and barriers to implementation of the identified best practices that must be considered;
- Assist in the collection of data concerning the current regulations and procedures addressing UPRT and FPM;
- Advise in the development of data collection instruments (e.g. surveys) and advise the Projects of the cultural sensitivities and recommendations to enable the collection of data/information;

# Flight Path Management/UPRT Focus Group
# Draft Terms of Reference


**Tasks (cont):**

- Assist with the identification of all Asia Pacific Airline companies, associated Approved Training Organizations and State Regulatory and Licensing Authorities for data/information collection;
- Assist in identifying pilot and company Subject Matter Experts (SMEs) in UPRT and FPM for all Asia Pacific Airline companies, associated Approved Training Organizations and State Regulatory and Licensing Authorities;
- Review and advise on the analysis and presentation of results with the companies and organizations identified above.

# Next Steps:

- Assist in the formation of the UPRT/FPM Focus Group by identifying prospective airlines and their operations and training experts
- Organizing a follow-up briefing with prospective members of the UPRT/FPM Focus Group
- Review and provide comments on the Detailed Implementation Plan

Risks:

- Lack of airline participation could affect the relevance of the findings and recommendations and the implementation of recommendations
- Reputational risk to AAPA and FSF
- FSF – AP-CAS financial risk