Lessons Learned in the Region

Capt. Richard Hill
Etihad Airways
mitigating runway excursions

lessons learnt
Safety Management Approach

• Risk mitigation required – threat and error analysis
threats and errors involved in runway excursion accidents

- non-compliance SOP
- directional control
- crew CRM
- touchdown hard
- touchdown fast
- approach fast
- runway contamination
- ldg gear malfunction
- long touchdown
- go around not conducted

**threats:**
- ineffective braking
- runway contamination
- landing gear malfunctions
Continuing an unstabilized approach is a causal factor in 40% of all approach and landing accidents.

Source: Airbus Industries

In 75% of the off-runway touchdown, tail strike or runway excursion/overrun accidents, the major cause was an unstable approach.

Source: Airbus Industries
Some of the causal Factors for high energy approach

- Time pressure (both by the Crew and by ATC).
- Unfamiliar local procedures.
- Late Runway change.
- Tailwind approach

- ATC instructions which result in the Aircraft being too high or too fast.
- Crew or ATC induced changes (speed, altitude track) that result in insufficient time to plan and execute the approach.
- Unrealistic planning of the approach in the FMS resulting in incorrect descend path calculation.
Typical Indications for unstabilized approach

- Approach flown in Idle power until touch down.
- Excessive Bank Angle during intercept of final track.
- Late extension of flaps or activation of flap load relief system.
- High Runway Threshold crossing
- Long Flare
- Dual Input during landing (Airbus only)
Unstable Approach Prevention Strategies

Training

Policies

Documentation

Technology
A example of effective mitigation

- Late Flap extension
- Long/short landings
- High Speed below 5000’ AGL
- High ROD below 1000’ AGL
Initial Analysis

Contributing Factors of AMM

- Insufficient situational awareness
- High Airfield Elevation
- Altitude restrictions in Descend
- Insufficient Airfield Briefing
- ATC vectoring

Etihad Airways Flight Operations
Analysis Result

Contributing Factors of AMM

- Insufficient situational awareness
- High Airfield Elevation
- Insufficient Airfield Briefing
- Altitude restrictions in Descend
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Mitigation Strategy

- LFUS
- Simulator
- Ground Refresher

- CAT B Airport
- Stabilized Approach Policy

- RAAS
- ROPS

- Update OM C
- Tailor Airport Charts

Training

Policy

Technology

Documents
Within 6 month AMM disappeared from list of Airports with a elevated number of FDM rates.
aircraft operators’ lessons learnt

- clear policy
- rigorous training
- just culture

zero tolerance for unstable approaches not flown to go-around
ATC lessons learnt

✓ knowledge of aircraft performance
✓ speed control appropriate to type
✓ communicate track miles to landing
✓ know what the upper wind is doing
airport operators lessons learnt

- approach procedure design
- distance/approach slope guidance
- runway surface friction levels
- vertical wind profiler
THANK YOU