Safety Based Evolution of Procedures

Cpt. Christof-J. Kemény

Cpt. Richard Bakker
Past & Present -- Evolution

Standard Operating Procedure

Here & Now
Evolution
Intention: Teamwork
Industry Research

Operational Use of Flight Path Management Systems
September 5, 2013

Monitoring Matters
Guidance on the Development of Pilot Monitoring Skills
CIA Paper 2013/02

A Practical Guide for Improving Flight Path Monitoring
Final Report of the Active Flight Monitoring Working Group

Go-Around Decision-Making and Execution Project

• We know procedures are a critical safety and operational topic for successful flight path management

Dr. Kathy Abbott, Yesterday Afternoon
Crew Performance & Procedure Design

Cpt. Dr. Christian Popp (Ph.D), JetBlue Airways Co-Founder

Based on existing Scientific Research & Industry Findings

➢ Human Performance based Procedure Design
➢ Teamwork integral part
➢ Team Building Elements
➢ Linguistic Relevance
Discrepancy
The Cognitive Triangle

THOUGHTS
What we think affects how we feel and act

EMOTIONS
How we feel affects what we think and do

BEHAVIOUR
What we do affects how we think and feel

The way we perceive the world
Latin “monere”

Warning
Reminding
Advising
Complaining
Brain Research & Cognitive Performance

- Hand Flying Pilot Flying Pilot Supporting
- Intermediate Level of Automation Pilot Operating Pilot Supporting
- Full Level of Automation Pilot active Monitoring Pilot Supporting

SOP
- Pilot Flying Pilot Supporting
When accelerating through F-speed:

**FLAPS**  
"CLIMB SEQUENCE"  
"FLAPS....."

**RETRACT**  
**B**  
**COMMAND**  
**PF**  
**CALL**  
**PM**

At “F” speed PM will call out next lower flap setting than actual flap position by "Flaps ....." **before** selecting the flaps lever to this position.
During approach for landing, when ready for continuous deceleration to $V_{REF}$ (typically from FLAP 2/gear up configuration), the PF calls “Gear down, landing sequence”. In this case the PM will:

- Select landing gear down and extend the flaps as the aircraft decelerates, according to the recommended speeds.
Supporting Action – Abnormal Ops

Windshear

GoAround Alt 2.000ft

High Risk:

• Altitude Bust
• Flap Overspeed
## Windshear

### POST WINDSHEAR PROCEDURE APPROACH

<table>
<thead>
<tr>
<th>PF</th>
<th>PM</th>
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<tr>
<td>&quot;OUT OF WINDSHEAR&quot;.</td>
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When flight path is under control:

- When ready to restore the appropriate modes on the GP, calls: "RESTORE".
  - Presses FLCH.
  - Engages AT.
  - Selects HDG.
  - Engages AP.
OneTeamCockpit – Enhancing the Flexibility of Flight Deck Procedures during the Go-around

Tim André Schmidt (Airbus Defence and Space GmbH), Dr Jim Nixon (Cranfield University), Houda Kerkoub Kourdalı (George Mason University), Christof Kemény (Lufthansa Cityline), Dr Christian Popp (JetBlue)
In conclusion the participating crew members reported that the OneTeamCockpit Concept improved their workload balancing and subsequently enabled them to effectively manage the Flight Path in complex flight maneuvers.
Supporting Action – Scientific Based

Programing and Setup

Pilot Flying

Pilot Supporting

Reviews and Initiates Briefs
Q. What do you think of our briefings?

- Relevance is lacking
- Too long!
- Items continually being added
- Equal attention shouldn’t be given to all items
**DEPARTURE BRIEFING**

**Threats** (PM, PF)

**Plan**
- Taxi, Dept Rwy
- Route (Clearance/Flight Plan – FMC RTE crosscheck)
- Return (emerg, T/O alt)
- T/O perf valid, perf/config issues

**Considerations**
- Any specific PM duties, other considerations
- Recap as needed

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My leg, your leg...
Supporting Action – Go Around

21 Go-Around Decision Making Recommendations

21 Go-Around Execution Recommendation

Teamwork in Decision Making
Supporting Action – Go Around

Configuration Gate

Stable Approach Zone

Go Around Decision Gate

1,000 ft

500 ft

100 ft
Conclusion

Procedure Design to include

- **Scientific Research (Brain Science) & Industry Work** to address human limitations
- **Best Industry Practice**
- **Teamwork Building Concept**
- **Tailored Linguistic Nomenclature**

To Enhance Flight Safety