

# Operational Risk Assessment

## Flight Risk Assessment Tool

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# What's it all about?

- The Flight Risk Assessment Tool
  - Where did it come from?
  - Did we make this stuff up?
- Safety management
- FRAT using paper
- FRAT using technology

# Turbine Aircraft Operations Subgroup (TAOS)

- Where did it come from?
  - TAOS formed in April, 2005
  - Part of General Aviation Joint Steering Committee
  - Representatives of industry, associations and government
- Reviewed 10 years of turbine aircraft historical data to get started

# Turbine Aircraft Operations Subgroup (TAOS)

- What we thought we could help with:
  - Runway overruns
    - AC 120-79
  - Positioning flights
    - SAFO 07006
  - Safety management
    - How can we prevent bad things from happening before they happen?

# Safety Management

- Safety Management
  - Reactive - Good
    - *Let's fix it after it happens and hope it doesn't happen again*
  - Proactive – Better
    - *Let's do safety stuff and try to avoid bad things happening*
  - Predictive - Best
    - *Let's use information (and our experience) to mitigate hazards and control risk before we do stuff*
  - *Is flight risk assessment proactive or predictive?*

# Safety Management

- **Hazard** — any existing or potential condition that can lead to injury, illness, or death to people; damage to or loss of a system, equipment, or property; or damage to the environment. A hazard is a condition that is a prerequisite to an accident or incident.

***In English: hazards are bad and can get someone injured or killed or something broken.***

# Safety Management

- **Risk** — The composite of predicted severity and likelihood of the potential effect of a hazard in the worst credible system state.

***In English: severity X likelihood = RISK***

**The hard part:  
*How do you determine  
severity and likelihood?***

# Safety Management

- Likelihood – probability of unsafe event or condition might occur
  - Frequent, likely, occasional,..seldom
- Severity – lives lost, property damage, etc.
  - Catastrophic, critical,...negligible
- *But when you are talking about airplanes...*

# Flight Risk Assessment Tool

- This makes risk assessment in real-time very complex and subjective
- TAOS goal – simplify the process
  - Keep the benefits
  - Customize to specific operation
  - Assumptions in “risk value”
    - Based on accident/incident data

# Flight Risk Assessment Tool

- Not a new concept
- FRAT developed by TAOS
- InFO 07015
- Started as a tool for repositioning flights
- Looks at three areas
  - Pilot Qualifications and Experience
  - Operating Environment
  - Equipment

# Flight Risk Assessment Tool

Using accident data to set “risk value”

- 28 Turbine Accidents from 2005 reviewed
  - Part 91 and Part 135
  - NTSB reports lacked fidelity
- Identified specific factors and number of occurrences

# Flight Risk Assessment Tool

A few of the factors considered:

Factor	Number of Occurrences	% Present
No Dispatch Department	15	54%
Uncontrolled Airport	12	43%
Night Operations	7	25%
VOR/GPS/LOC/ADF Best Approach	6	21%
PIC Flying Aircraft	5	18%
Crosswinds > 15 Knots	5	18%
Pilot Flying (Left Seat)	4	14%
ILS Best Approach	4	14%
Mountainous Airport	4	14%
Ceiling & Vis < 500/2, >300/1	4	14%
Captain < 200 hours in type (*<50 = 1)	3	11%

# Flight Risk Assessment Tool

**Identified Hazards**

**Risk Value**  
Severity X Likelihood

**Flight Value**

**Flight Risk Assessment Tool**

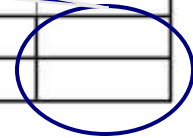
Date: \_\_\_\_\_ Departure: \_\_\_\_\_  
 Mission # \_\_\_\_\_  
 Tail # \_\_\_\_\_ Destination: \_\_\_\_\_

		Risk Value	Flight Value
<b>Pilot Qualifications and Experience</b>			
1	Captain with less than 200 hours in type	5	
2	First Officer with less than 200 hours in type	5	
3	Single Pilot Flight	5	
4	Captain with less than 100 hours last 90 days	3	
5	First Officer with less than 100 hours last 90 days	3	
6	Duty day greater than 12 hours	4	
7	Flight time (Greater than 8 hours in the duty day)	4	
8	Crew Rest (Less than 10 hours prior to the duty day)	5	
<b>Total Factor Score - Section 1</b>			
<b>Operating Environment</b>			
9	VOR/GPS/LOC/ADF (Best approach available w/o vertical guidance)	3	
10	Circling approach (best available approach)	4	
11	No published approaches	4	
12	Mountainous airport	5	
13	Control tower not operational at ETA or ETD	3	
14	Uncontrolled airport	5	
15	Alternate airport not selected	4	

# Flight Risk Assessment Tool

21	Night operation	5	
22	Stopping distance greater than 80% of available runway	5	
23	Repositioning flight (no passengers or cargo)	5	
24	Pop up trip (Less than 4 hours crew notice)	3	
25	International operation	2	
26	No weather reporting at destination	5	
27	Thunderstorms at departure and/or destination	4	
28	Severe turbulence	5	
29	Ceiling & visibility at destination less than 500 ft / 2 sm	3	
30	Heavy rain at departure and/or destination	5	
31	Frozen precipitation at departure and/or destination	3	
32	Icing (moderate-severe)	5	
33	Surface winds greater than 30 knots	4	
34	Crosswinds greater than 15 knots		
35	Runway braking action less than g		
<b>Equipment</b>			
36	Special Flight Permit Operation (fe		
37	MEL / CDL Items (items related to s		
38	Special flight limitations based on AFM equipment limitations	2	
<i>Total Factor Score - Section 3</i>			
<b>TOTALS</b>			

**Total Flight Value**



# Flight Risk Assessment Tool

## Setting Operational Thresholds

- Operator specific
- Thresholds based on:
  - Type of operation
  - Environment
  - Aircraft type
  - Pilot training
  - Operational experience

# Flight Risk Assessment Tool

## Setting Operational Thresholds

- Be realistic
  - If the threshold is never exceeded, it is probably not set correctly
- Thresholds should trigger another level of review
  - Director of Operations
  - Chief Pilot

# Flight Risk Assessment Tool

## The real deal on FRAT

- Proactive or predictive in nature?
- Customize to size and complexity of operation
- *Most important: Evaluate multiple hazards objectively*

# Automated Safety Risk Assessment Tool

David Vernon

Director of Technology Initiatives,  
NATA

# Questions?

## Operational Risk Assessment Flight Risk Assessment Tool

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Moderated by the amazing Lindsey McFarren

