



EARM ZURICH ARPT

Giovanni Zanivan, E2 Commander Performance Dept.

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SYSTEMIC DESCRIPTION



COMPONENT DESCRIPTION



- Project Manager = Leader
- Team: as small as possible (NPs, Crew, Dispatch, MMX)
- **Perform pragmatic Risk Assessment**
- Communicate with all involved partners
- Manage ops aspect: crew and aircraft availability
- **Define and organise Training briefing and simulator program**
- **Continuously ensure compliance with regulations**



RISK ASSESSMENT ELEMENTS

- Weather
- Airspace
- Aircraft limitations
- Aircraft system(s) failure
- Crew coordination

Risk Identification		Mitigation Action
A	Flight Envelope exceedance	<ul style="list-style-type: none"> • Aircraft operated within certified limitations (AFM chapter 2) • Chosen « display » speed well within MAX operational speed • Three pilots in the cockpit for monitoring and awareness • Ad hoc simulator training especially for 45° bank turns • LSGS CAT B trained pilots
B	Positioning flight from ZRH/BRN (IFR) to LSME CTR	<ul style="list-style-type: none"> • Flight will proceed IFR • Entire flight path will proceed via controlled airspaces (C, D)
C	Collision with other aircraft	<ul style="list-style-type: none"> • Three pilots in the cockpit for airspace surveillance • No flight into G-airspace • Flight under ATC control • Inbound and Outbound flight IFR flown up to holding area
D	Bird Strike	<ul style="list-style-type: none"> • OEI performance considered • Contact with ATC services
E	Airspace violation from other aircraft	<ul style="list-style-type: none"> • Entire flight path will proceed via controlled airspaces (C, D) • Continuously under radar contact • Continuous contact with ATC

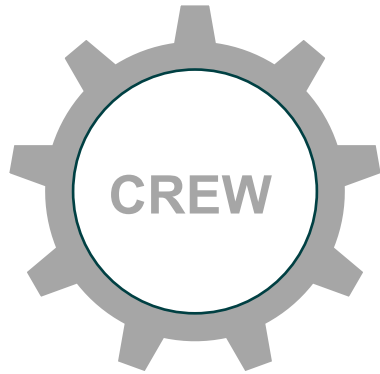
Risk Identification		Mitigation Action
F	E2-190 System Malfunction (abnormal / Emergency)	<ul style="list-style-type: none"> • Contingency procedures established
G	Up to 45° turns	<ul style="list-style-type: none"> • Turn radius calculation performed • Turns trained, in situ, in the simulator under FOCA inspector surveillance
H	Speed control during fly by in formation flight	<ul style="list-style-type: none"> • Briefing performed with PS leader • Autothrottle disconnected • Fly by performed ballistically
I	CFIT	<ul style="list-style-type: none"> • Three pilots in the cockpit for terrain awareness • VMC mandatory • EGPWS active during inbound and outbound flight. • OFF during display ONLY • Simulator training under FOCA inspector surveillance and PS-pilot if possible

TRAINING BRIEFING ELEMENTS

- Human Factors
- Geographical and Topographical Situation
- Operational Limitations
- Display Program
- Timing
- Contingency Procedures
- Duties and Responsibilities

Crew Coordination		
PF	PM	Safety Pilot
<ul style="list-style-type: none"> • Responsible for the aircraft's flight path • communicates with PS 	<ul style="list-style-type: none"> • monitors manipulations of PF • monitors aircraft parameters • reports deviations to defined limits • reports any malfunction 	<ul style="list-style-type: none"> • monitors PF and PM in terms of human factors • maintains the general overview • reports any observed deviation not seen by PF and PM • Has the authority to abort the display (FINITO, FINITO)

COMPONENT DESCRIPTION



- Belong wide flight experience: Visual, 2-Men, Air Display
- **Be part of Risk Assessment Team**
- Able to communicate transparently with involved partners
- During training phase: demonstrate the ability to execute the defined program safely, and precisely



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CONTINGENCY PROCEDURE	
PATRUILLÉ SUISSE	NOTIFIED
FLIGHT PATH	CLEAR OF OBSTACLE
AIRSPÉÉD	SET MIN GREEN DOT
ALTITUDE SELECTOR	SET SAFE ALTITUDE
NAV MODE (HDG)	SELECT
VERTICAL MODE (FLCH)	SELECT
AUTOTHROTTLE	ENGAGE
AUTOPILOT	ENGAGE
TCAS	TA/RA
FMS AURAL WRN	ON
FUEL QTY	CHECK
ATC CLEARANCE	REQUEST
FMS/LNAV	AS REQ
AT SAFE ALTITUDE	
FMS/LNAV	AS REQ
NAVIGATION MODE (VERT & LAT)	AS REQ
ABNORMAL CHECKLIST	PERFORM IF REQ
END	

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Checklist is:

- read by Safety Pilot (Jump Seat)
- performed by area of responsibility
- read and do

BEFORE DISPLAY CHECKLIST	
APU	START
EICAS	CHECK
QNH	SET
SPEED SELECTOR	SET MANUAL
MINIMUMS BARO/RA	OFF
FUEL QTY	MIN 4000kg
FMS AURAL WRN	OFF
TCAS	ALT OFF
STARTING DISPLAY	
AUTOPILOT	OFF
FLIGHT DIRECTOR	OFF
AUTOTHROTTLE	AS REQ
AIRSPÉÉD TARGET	250-290KIAS
ALT SELECTOR	SET MIN MSA
END OF DISPLAY	

NAV MODE (HDG)	SELECT
ALT SELECTOR	SET REQ ALT
VERTICAL MODE (V/S)	SELECT
SPEED	SET MIN GREEN DOT
AUTOTHROTTLE	ENGAGE
AUTOPILOT	ENGAGE
TCAS	TA/RA
FMS AURAL WRN	ON
FUEL QTY	CHECK
ATC / IFR CLEARANCE	REQUEST
APU	OFF

END

LESSONS LEARNED

- + Great benefit of joint briefing & simulator with PS leader, crew, NP FO, FOCA, ACM
- + Exchange, experience transfer between “partners”: very good and purposeful
- + Involvement of a «small team», advantageous (efficiency and communication)
- + Detailed adapted and pragmatic risk assessment with good presentation of the measures taken
- + Improvements after the first training flight on Friday flown into the display of Sunday
- + Exchange and collaboration with ATC can be improved

Improvement suggestions:

- In collaboration with NAA: define optimised use of airspace during air show
- Set up a group of controllers specially trained for Airshow traffic management
- ATC controller should be part of Airshow team

OUTCOME

