



Mid Fidelity Simulation



Expanding Experience
into
Expertise

IASS 2018

November 12-14

Seattle, USA

Capt. Mark Cameron - Emirates

From this...



We got to this...



And finally...



So what do we do?

30

4 TEMP/PRESS MON - He (2750-3200 psi)
 - PRPLNT (40°-100°/178-188 psi)
 - FUEL MANF (175-188)
 - OXID MAN (175-188)

don't flight
flight of Apollo 13 - Carried on and

DPS PRESS

1 ~~PRPLNT QTY MON - DES 1~~
 PROP TEMP/PRESS MON - DES 2
 HELIUM MON - ~~AMB PRESS~~ *SUPRCRIT PRESS*
 DES HE REG 1 - tb-gray bp
 DES HE REG 2 - tb-bp

2 DES PRPLNT ISOL VLV - FIRE
 HE PRESS/DES START - FIRE

3 PRPLNT TEMP/PRESS MON: DES 2&1
 (50°-90° FUEL, 50°-90° OXID/242-253 psi)
 HELIUM MON: AMB PRESS (200-1110 psi)
 SUPRCRIT PRESS (610-1070 psi)

Free Hitter
Apollo 13 LMP

LANDING GEAR DEPLOY

1 CB(11) LOGIC PWR A - Open
 LDG GEAR DEPLOY - FIRE, tb-gray

2 CB(11) LOGIC PWR A - Close
 LDG GEAR DEPLOY - FIRE
 MASTER ARM - OFF

ENABLE LMP CONTROLS

2 Verify HTRs (res) on for 15 min
2. Balance couple off - Dead band min
act control - pitch and roll & pulse
yaw - direct. Mode control - pos att
Hold, Guid control - pos. Darg rate
Pitch and roll with TTCA, Yaw
with ACA - w/ wick control.

LM-7
 Basic Date 1/6/70
 Changed 3/10/70

LM-7
 Type 4 page 29

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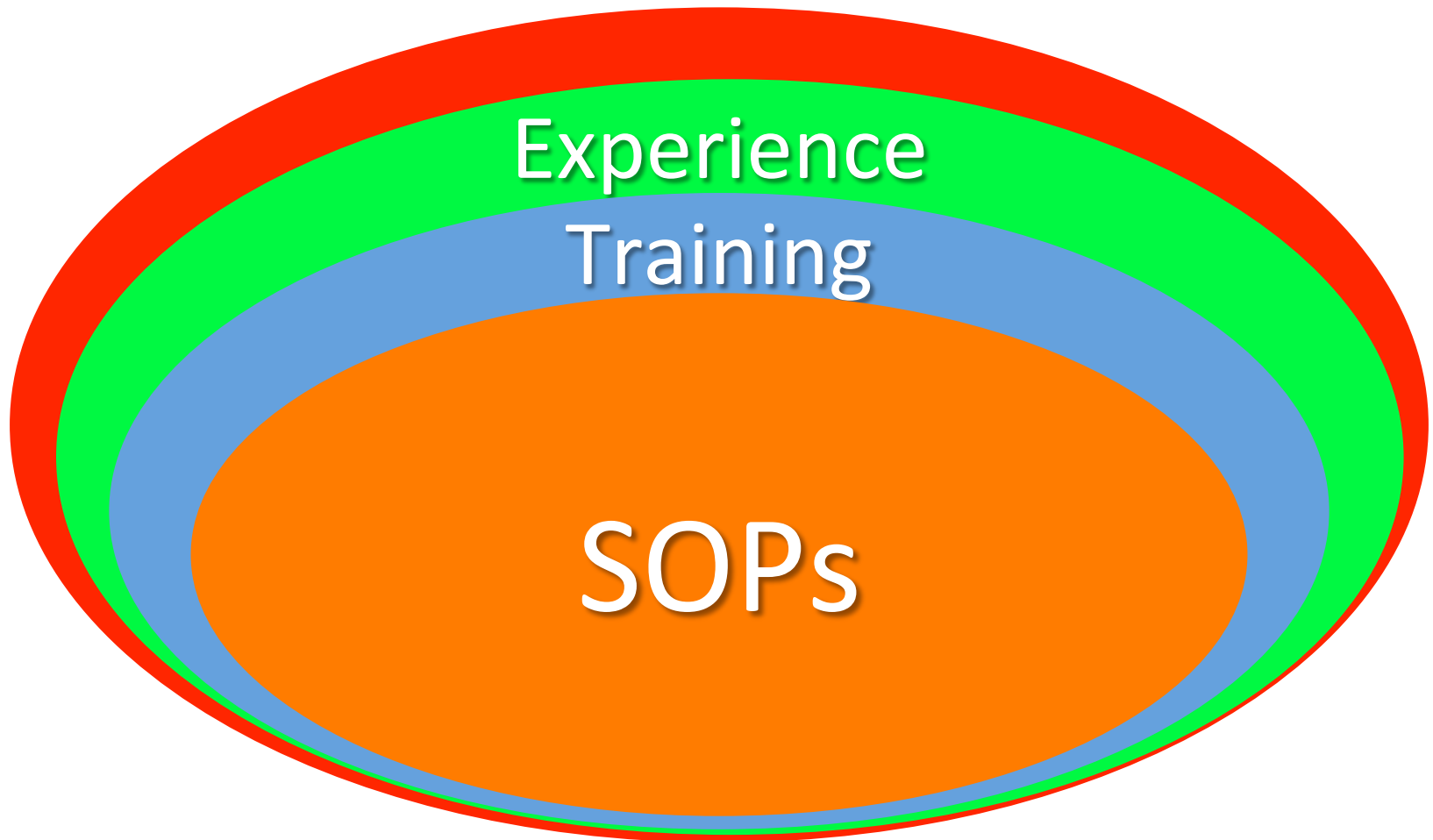
Change the checklist? – That usually works.

Find out what they did?



Tell them not to do it again?

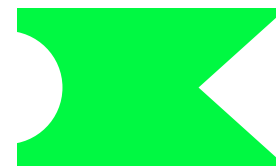
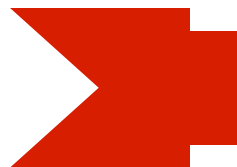
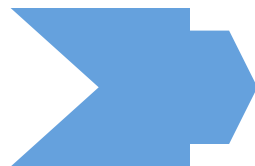
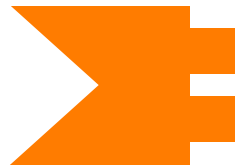
Line Experience 'Envelope' – The Gap



Resilience

Problem

Solution



SOP

Training

Experience

??

But what kind of package?

Reliable



Compliance



Focus on
Procedures

Resilient



Exploration



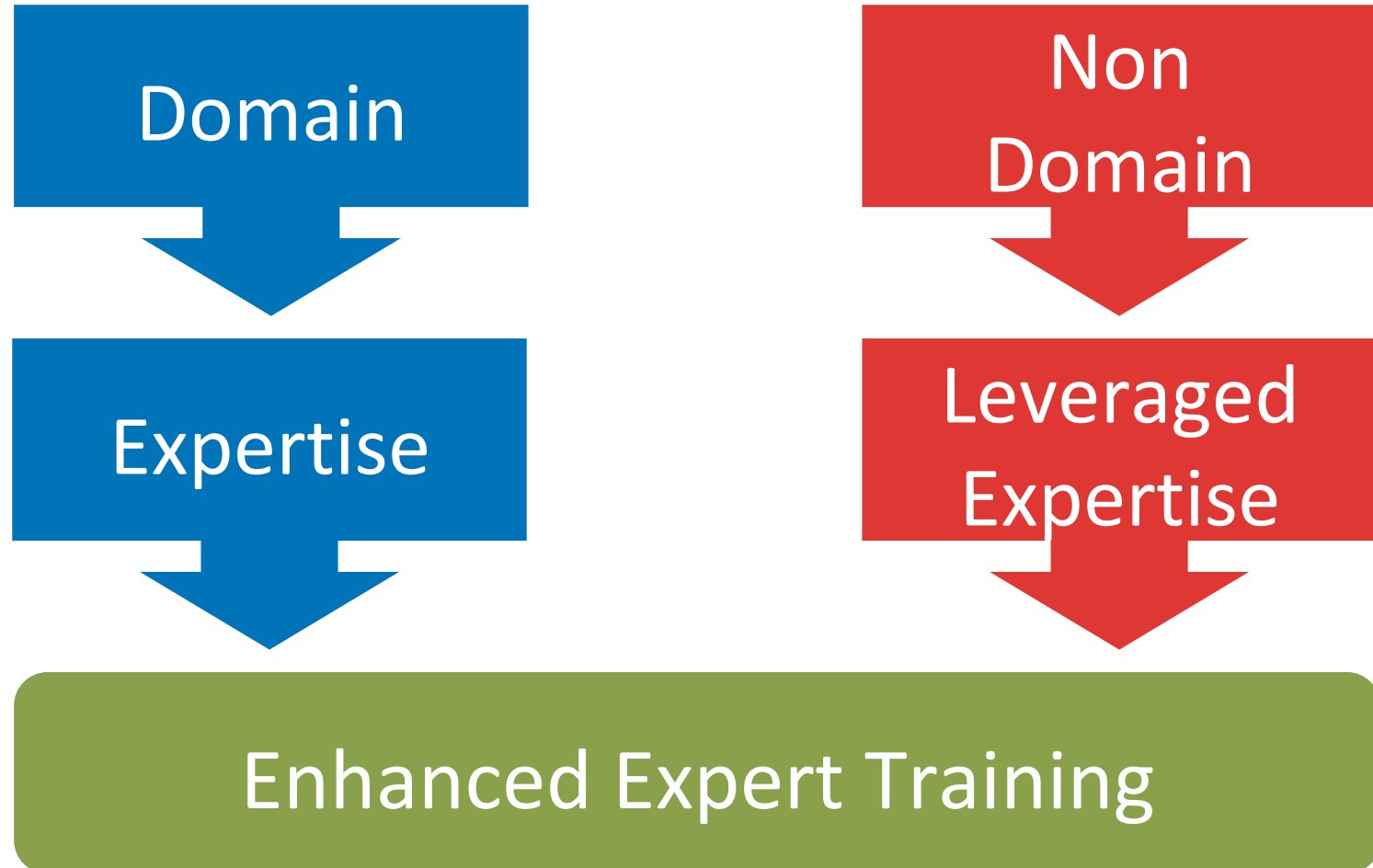
Focus on
Competence

Delivering the 'pinch point'



Mid Fidelity Simulation

But what kind of scenario?

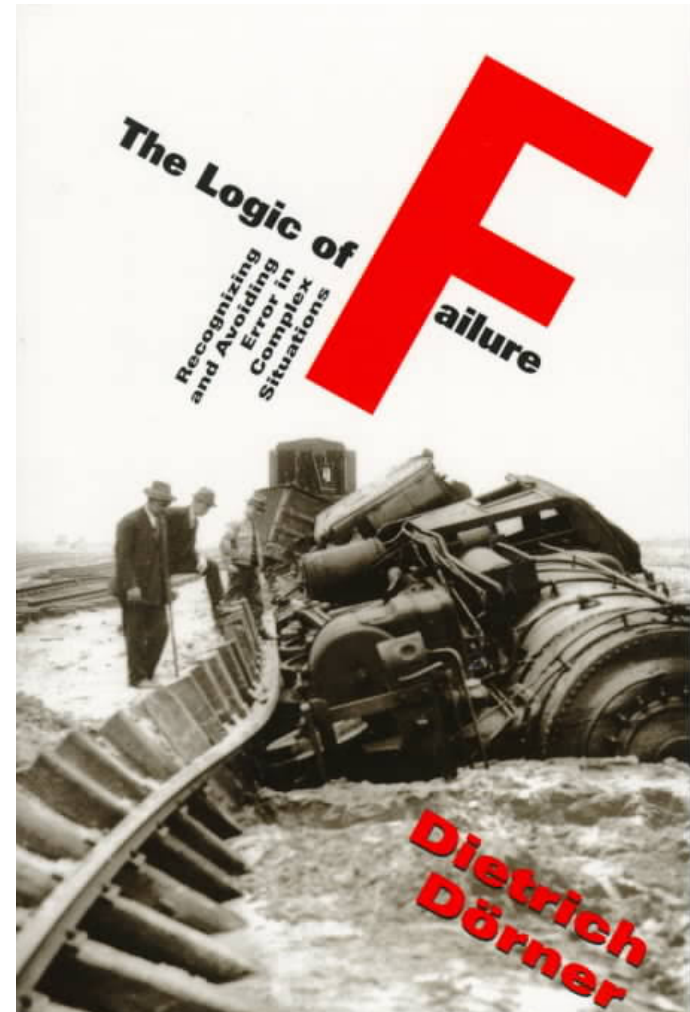


Assembling a scenario?

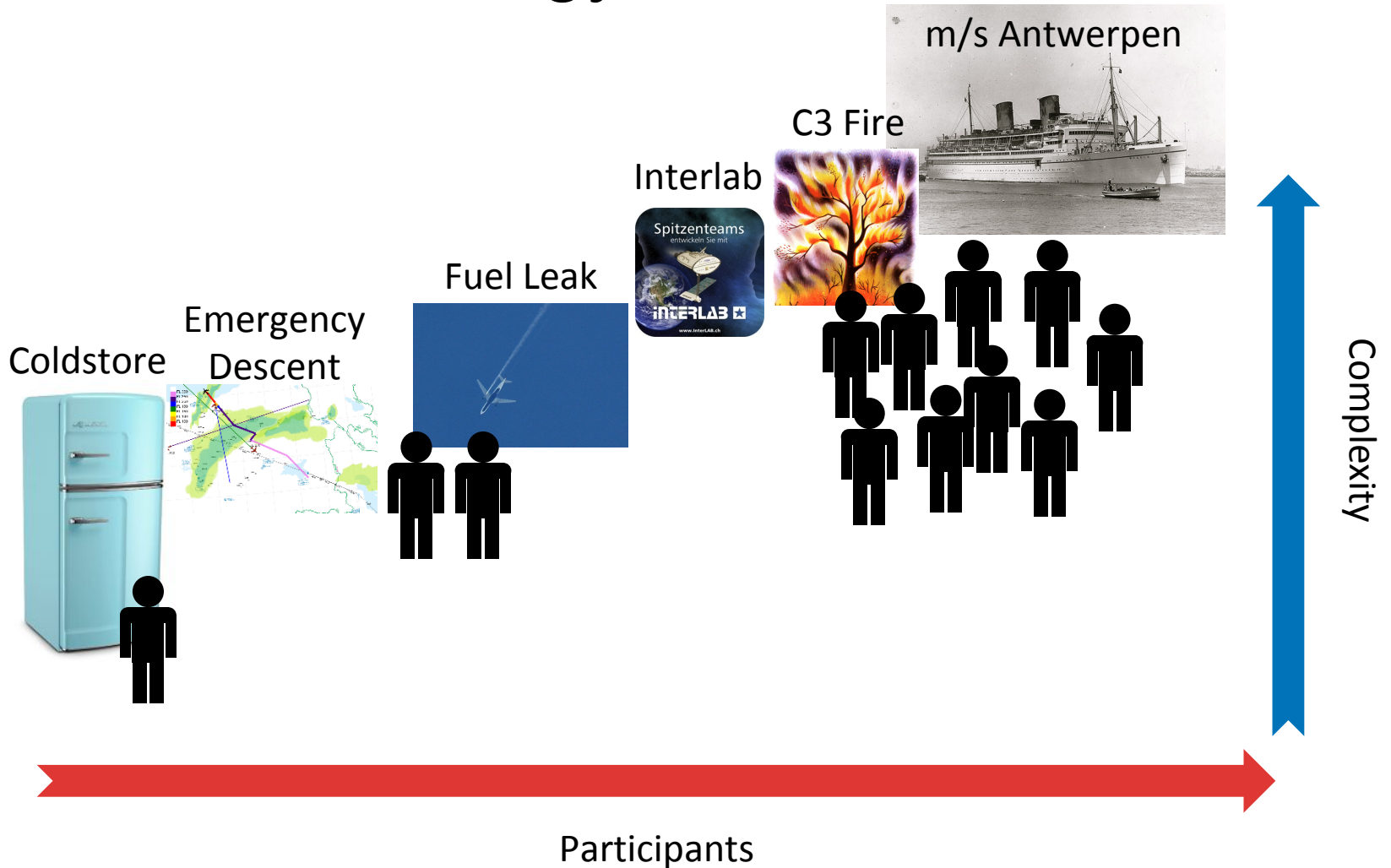


Microworlds

- Brehmer
- Dörner
- Dahlström



The 'Ecology' of simulations

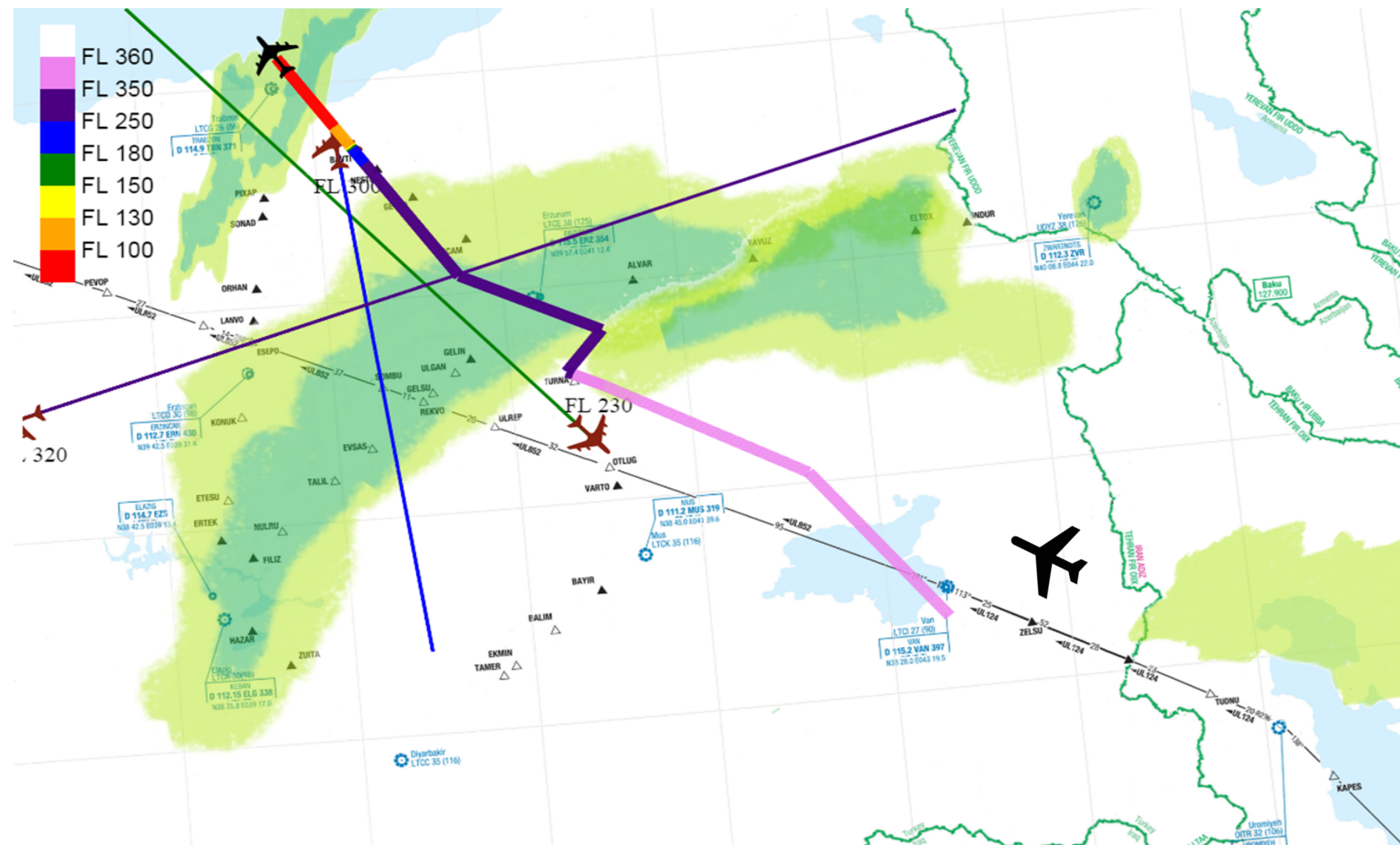


You have changed career, grown a hipster beard and now you are the manager of a supermarket...



Call from the supermarket:

“The automatic temperature control in the cold storage room has failed, you must come and sort out the temperature manually!”



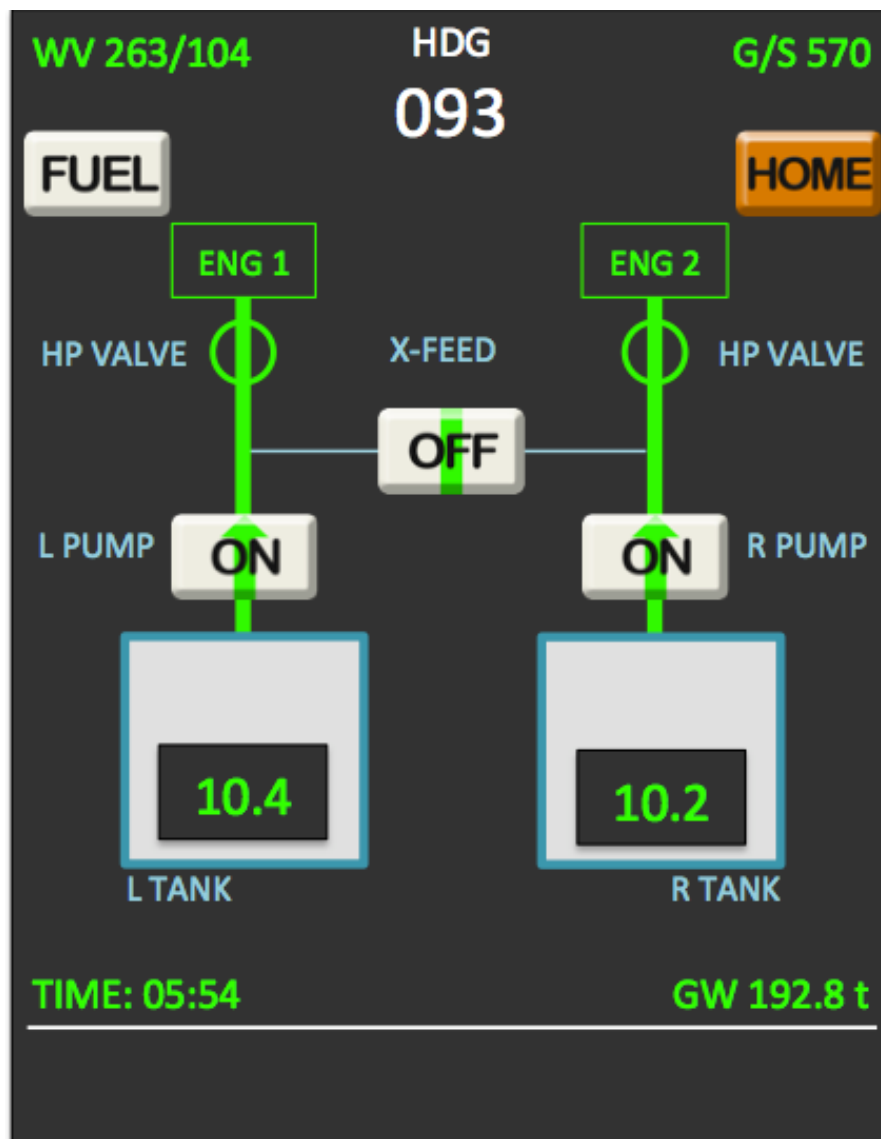
m/s Antwerpen



Design Goals

- Agnostic, (not A, B, C or E)
- Essentials – what is the minimum required?
- Intuitive indication of functional relationships.

Which means...



Utility of MFS

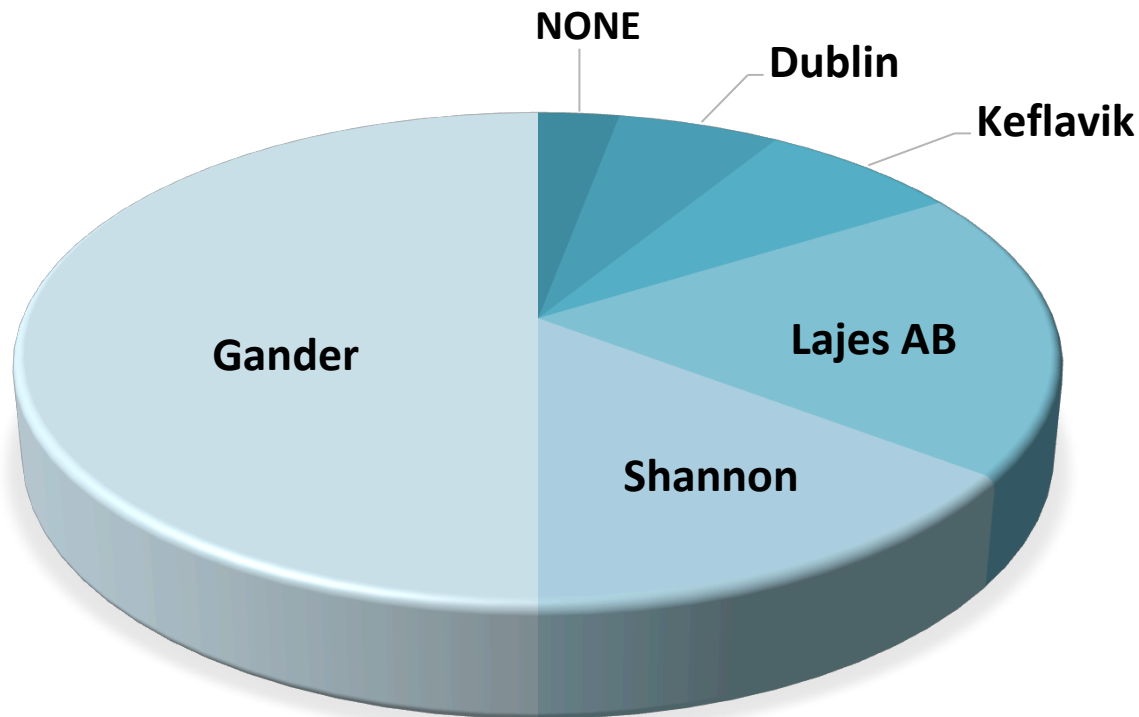
- Complementing and enhancing training
 - Provides experience of unusual and complex situations
 - “Risk free” learning beyond execution of SOPs
- Provides pilot performance data
 - Logs of actions for analysis, feedback and training design
 - Development towards automatic feedback and debriefing
- Flexibility and cost
 - Can be done anywhere and anytime at limited cost
 - Responsive to new and short-term training requirements

MFS 'in the wild'



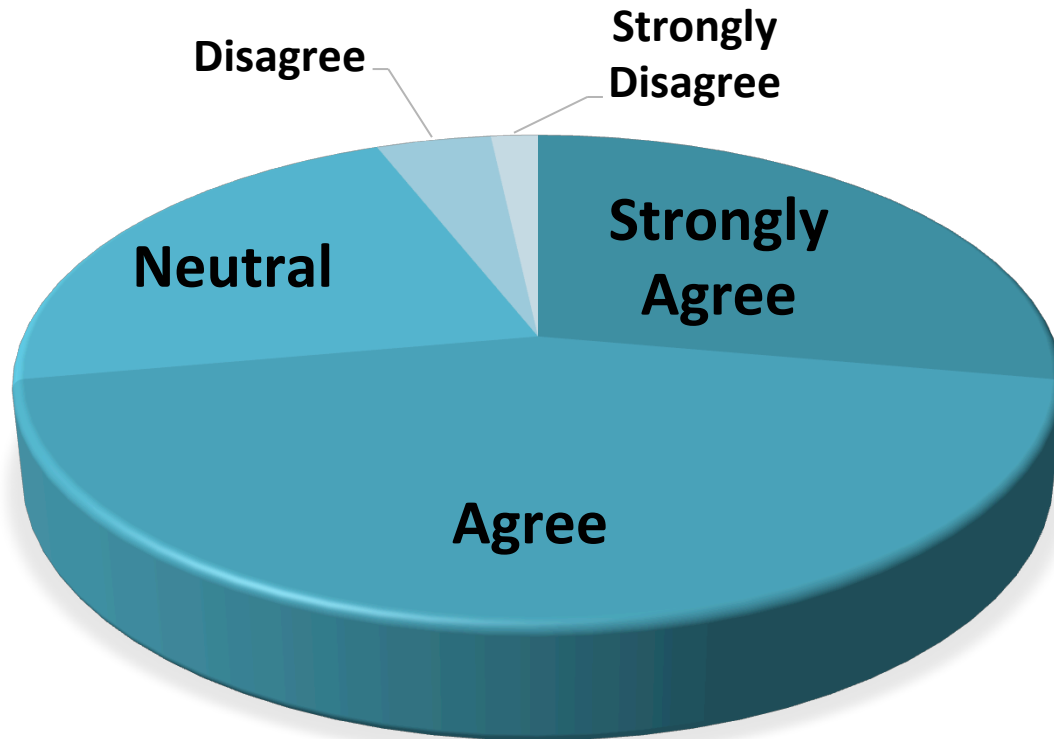
From exactly the same starting point...

ALTERNATE SELECTIONS



Opinions count...

**I WOULD LIKE TO DO MORE OF THESE
SIMULATIONS...**



Planned Work

- Expanding the functionality of the simulation
 - Flight trajectory management
 - Communication capabilities
- Development of new scenarios and of delivery of simulation as part of a training module
- Aim for a "suite of simulations" to become fully integrated in pilot training programs



Thank You