



SESAR Showcase

A Conference & Exhibition of SESAR 1 Results

Amsterdam, 14-16 June 2016



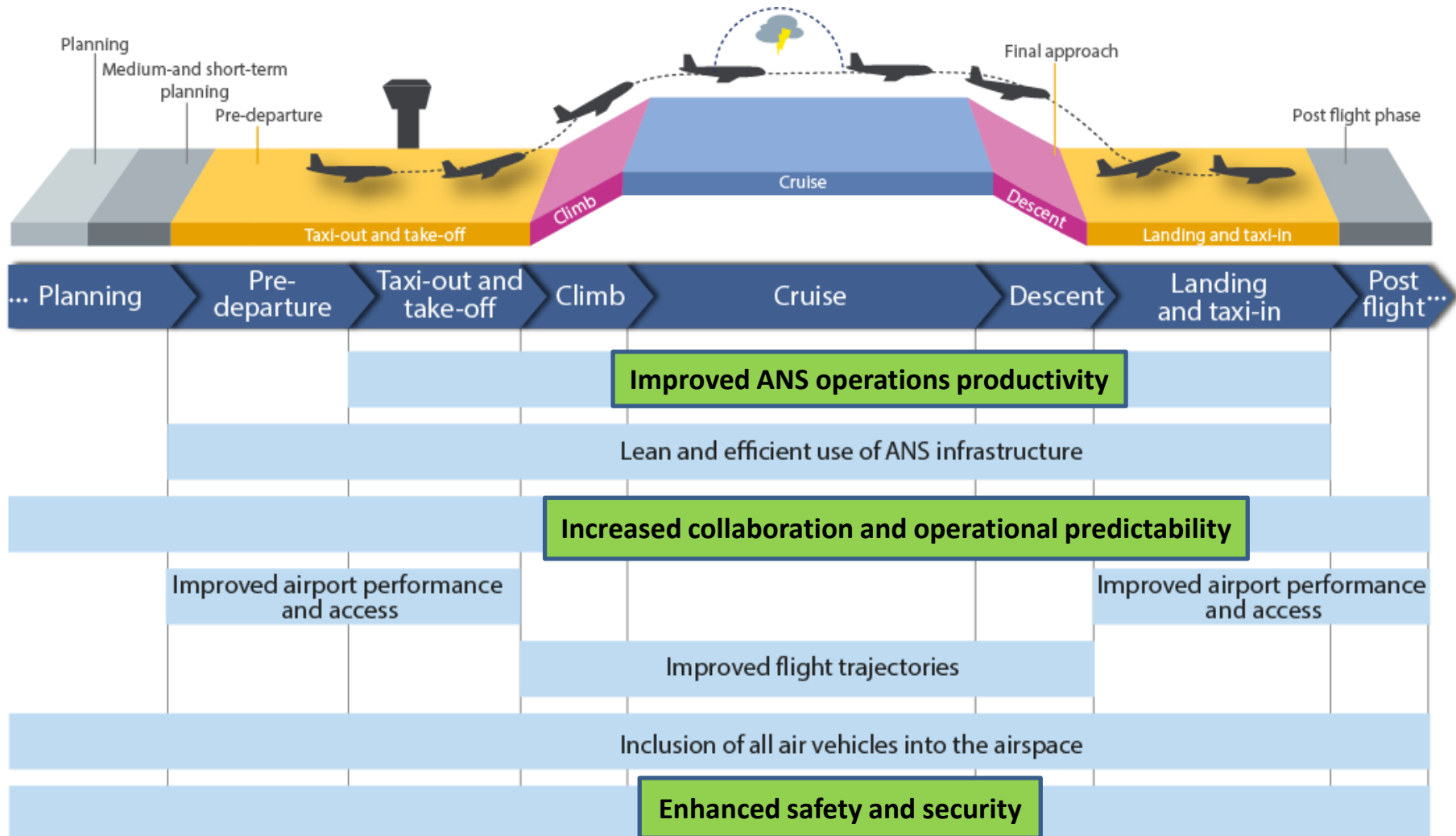


Conflict detection and resolution aid to controllers

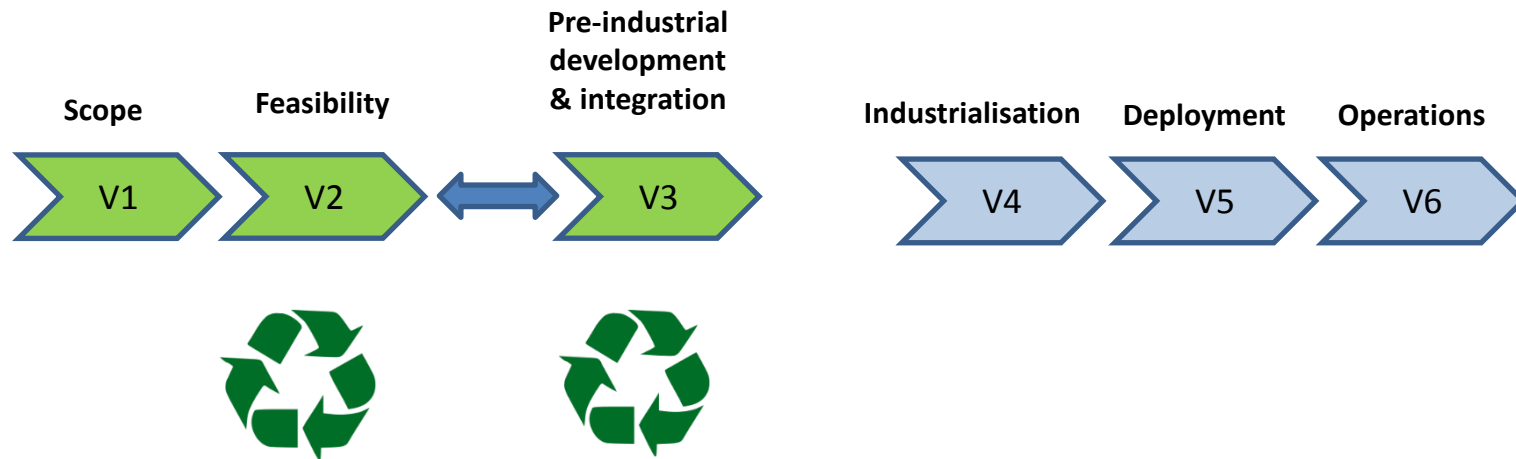
Jean-Louis Garcia, DSNA



Objectives



Partners/Process



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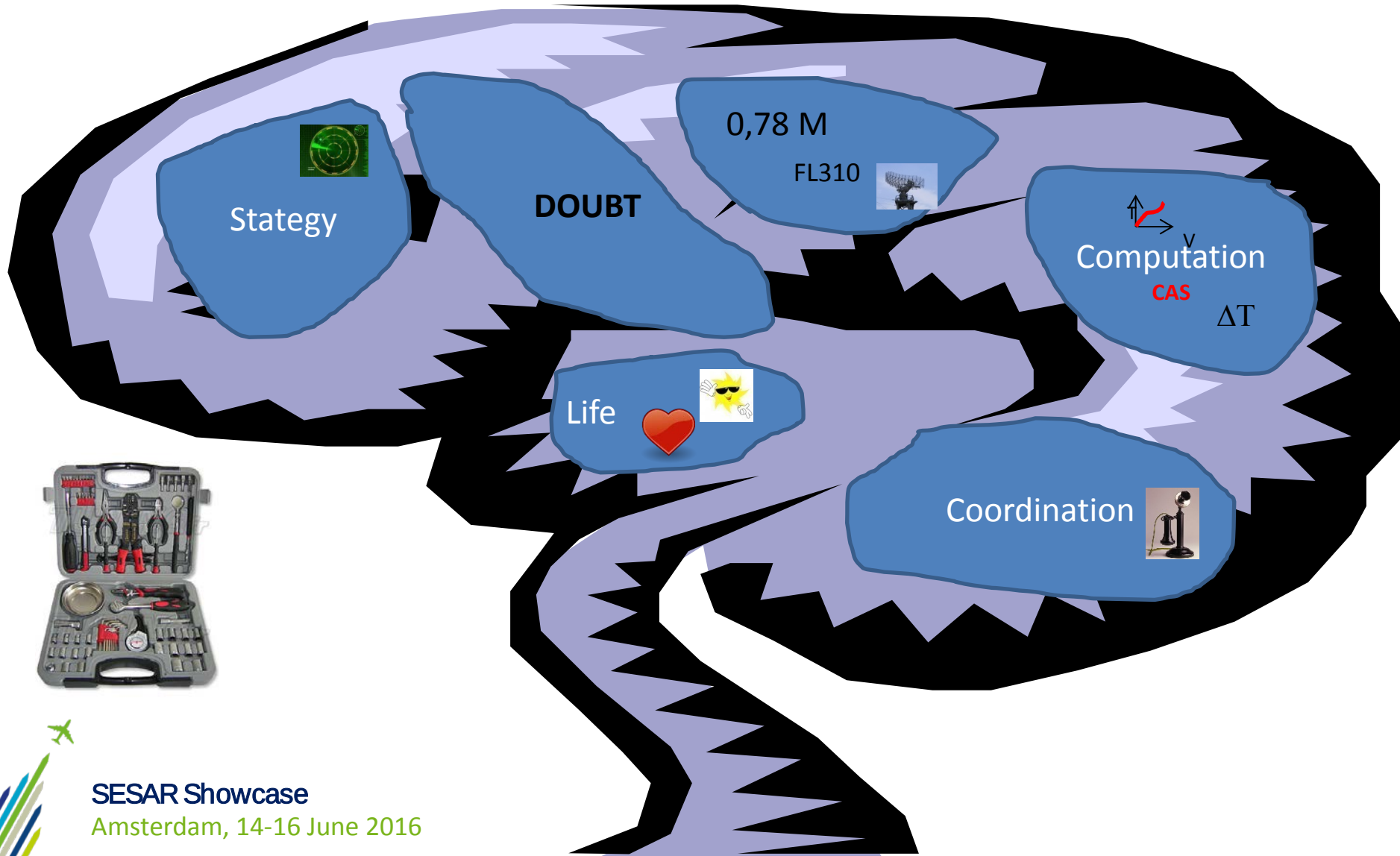
The en-route capacity bottleneck

- The Sector Productivity is constrained by the tactical air traffic control mental process limitation



Doubt Management is directly linked to the complexity and a very cognitive consuming element

How

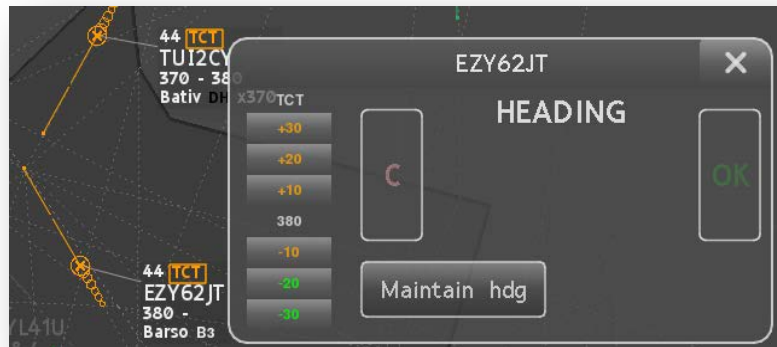


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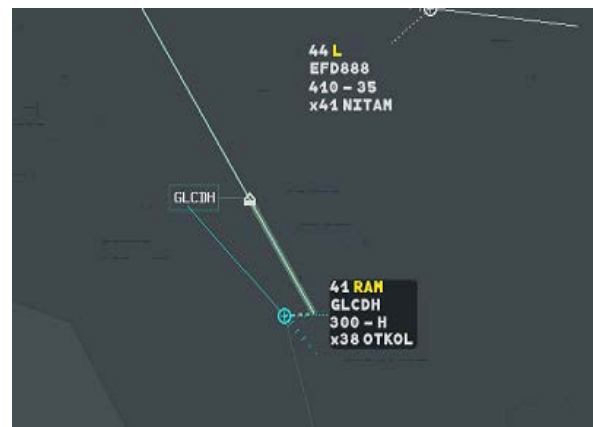
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Tactical controller tools – Thales/DSNA

- Conflict detection & resolution tools

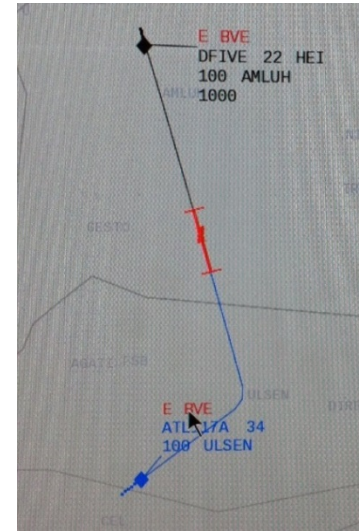


- Monitoring tools



Tactical controller tools – Indra/DFS

- Conflict detection & resolution tools



DLH1HT	DLH1HT
CFL	RATE
100	BAND
VCD OFF	10
App	15
130	20
120	25
110	30
100	35
090	+
080	-
070	
060	
A050	
A040	
A030	
A020	
A010	
Ind.	
Execute	

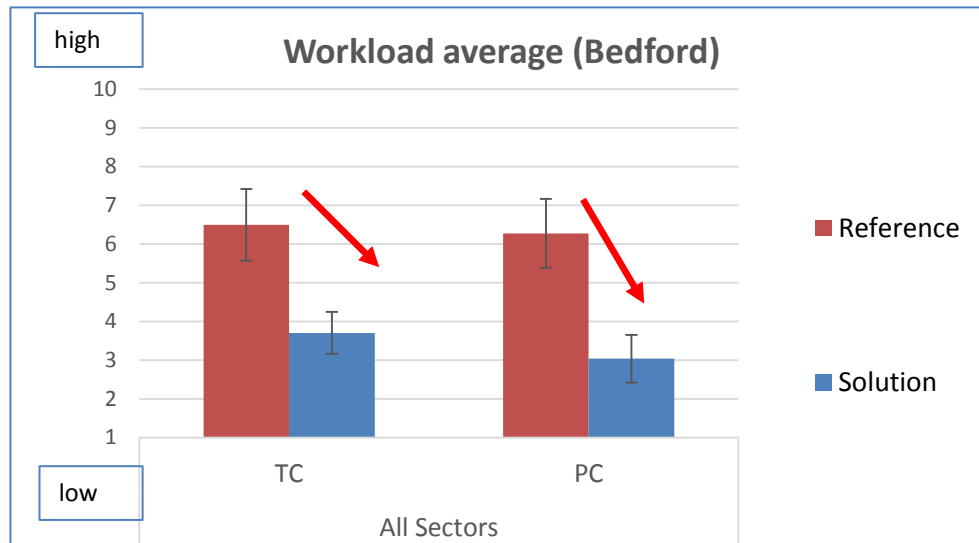
BLACK
GREEN
BLUE
RED

- Monitoring tools

DEV				
GMI1962	34	EMS	100	
92	32	BASUM	100	
1000				
Route Deviation				
GMI1962	34	EMS	100	
100	32	BASUM	120	
1000				
CFL Deviation				

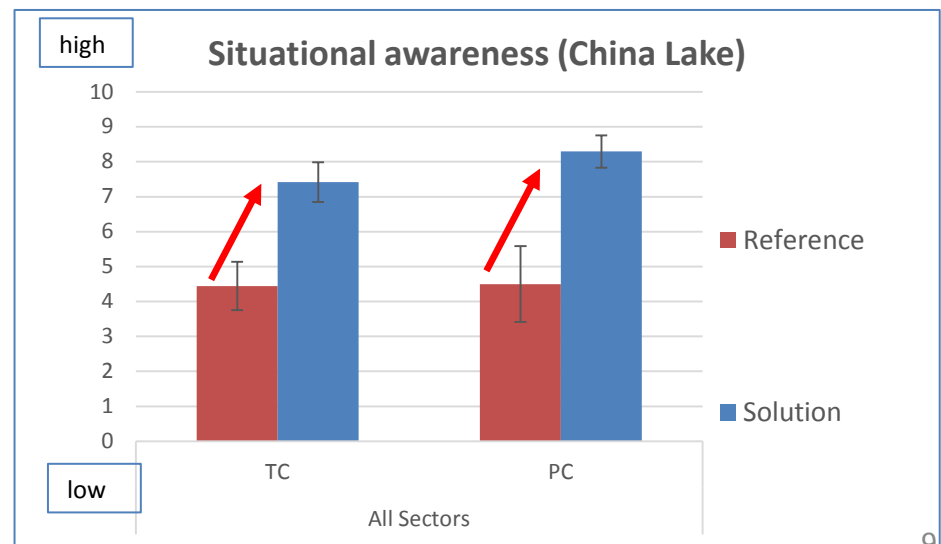
Some statistics

- Significant workload decrease with Tactical Tools (Solution)
- Traffic in all measured scenarios was about 150 % of current sector capacity values



- Situational Awareness much better in solution scenario with Tactical Tools

TC - Tactical Controller
PC - Planning Controller



The way forward

MONITORING

Mona



CONFLICT DETECTION

Short term



Medium term



CONFLICT RESOLUTION

What if Flight Level



What if Heading



What else



Mature



Partially mature



Need more studies



Thank you for your attention



More information:

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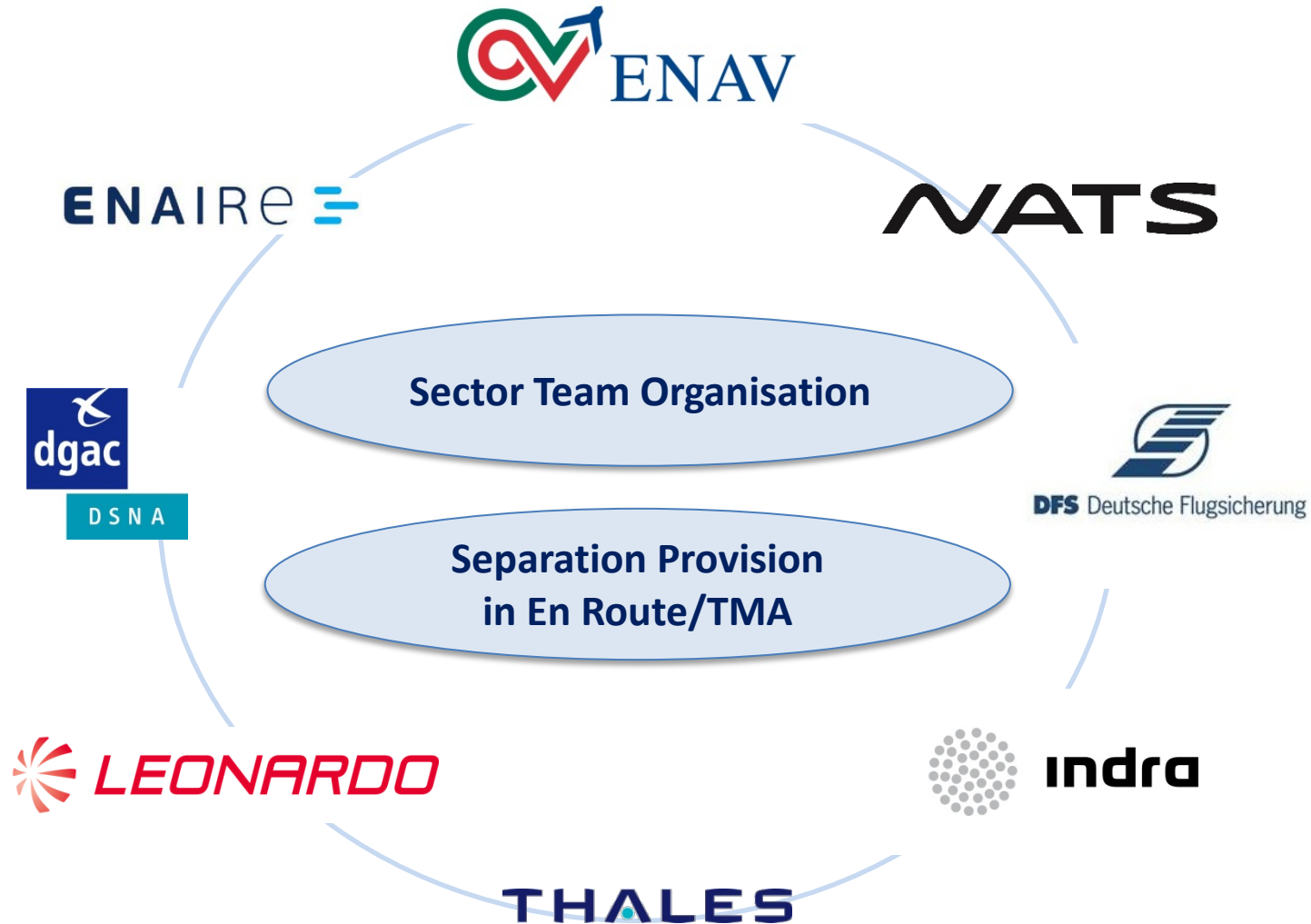
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Advanced Separation Management Tools and new ATCO organization schemas

Leticia González (Indra)

SESAR1 Partners in collaboration

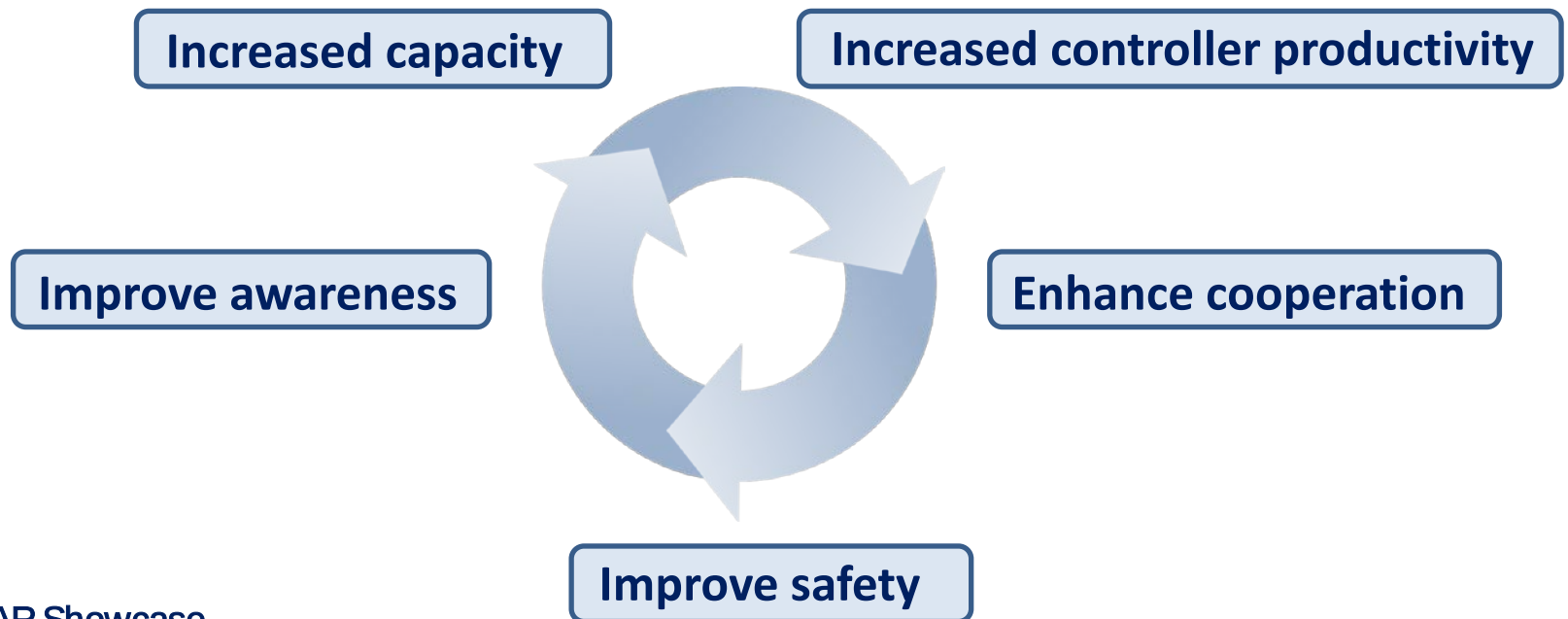


Before SESAR1

Current ACC Operations

Coordination by procedures

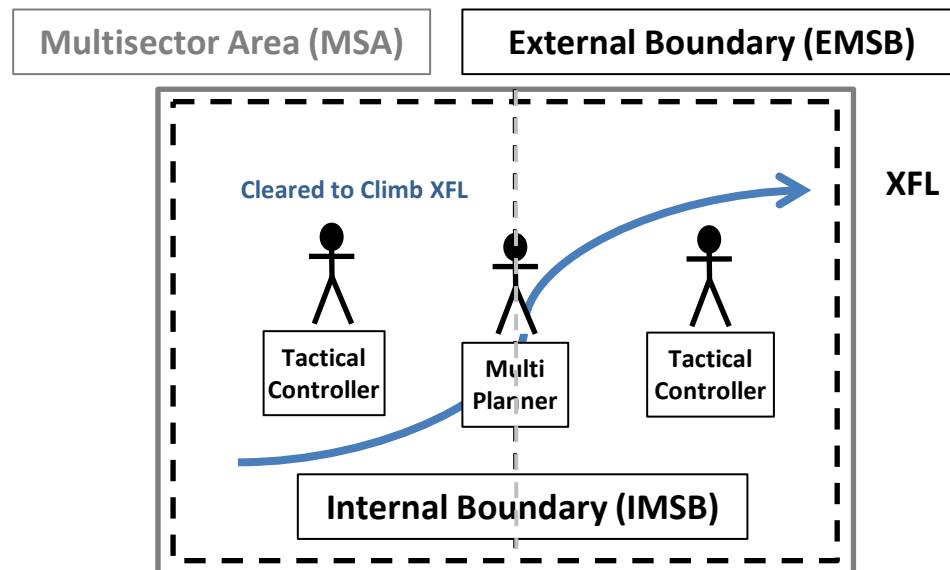
SESAR1 Goals



SESAR1: Collaborative Control

Collaborative Boundaries

- Co-ordination by exception
- Clearances to aircraft when required at any flight position to maintain separation



Tools Supporting controllers in Collaborative Control

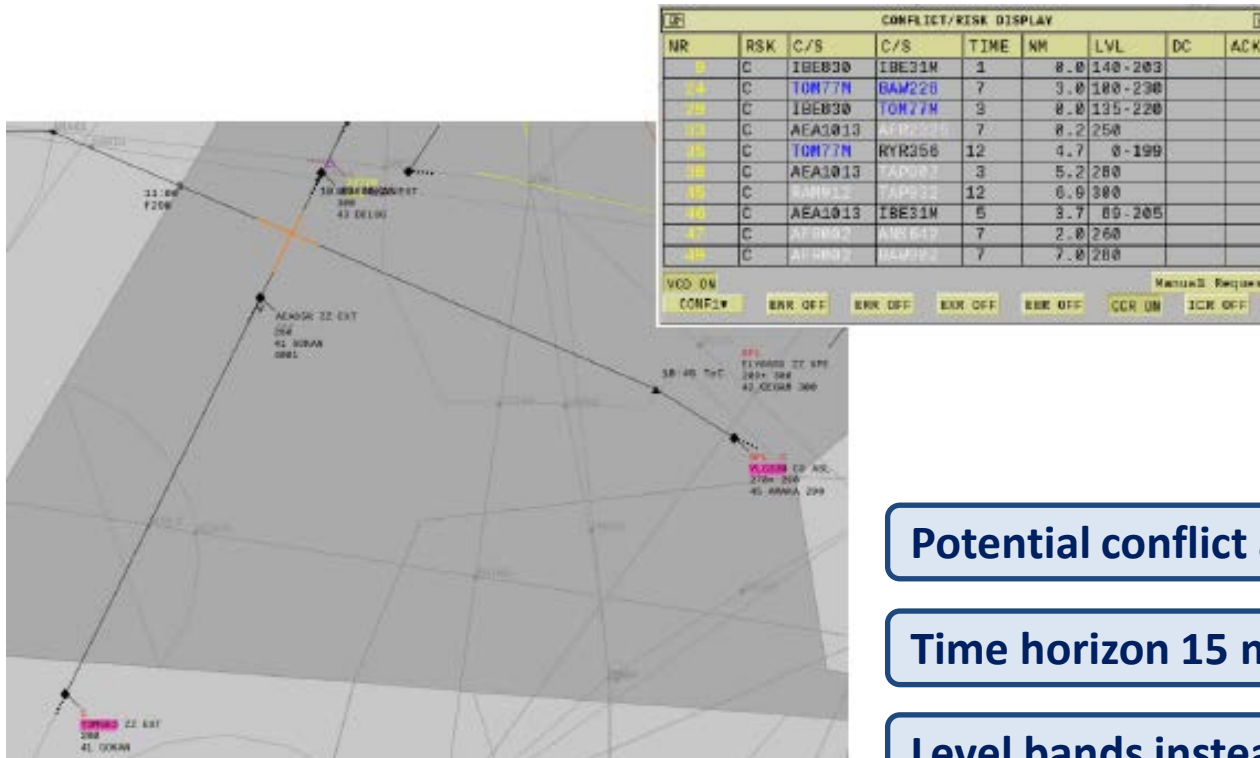


VALIDATED IN SESAR-1

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SESAR1: Advanced medium-term conflict detection



Potential conflict are detected: Risk

Time horizon 15 min

Level bands instead of vertical profile

Different types of risk based on flight position in the sector



SESAR1: Validation findings

Collaborative Control

Safety: Situational awareness increase

Cost effectiveness: number of controllers in the planning activities is optimised

Capacity: capacity increase. Flexible sector configuration, reduce number of clearances

Controller productivity: efficiency increase. Better and more efficient solutions to solve conflicts.



Future activities in SESAR2020

**Controller Tools and Team Organisation
for the Provision of Separation
in Air Traffic Management**



High Productivity Controller Team Organisation



Collaborative Control

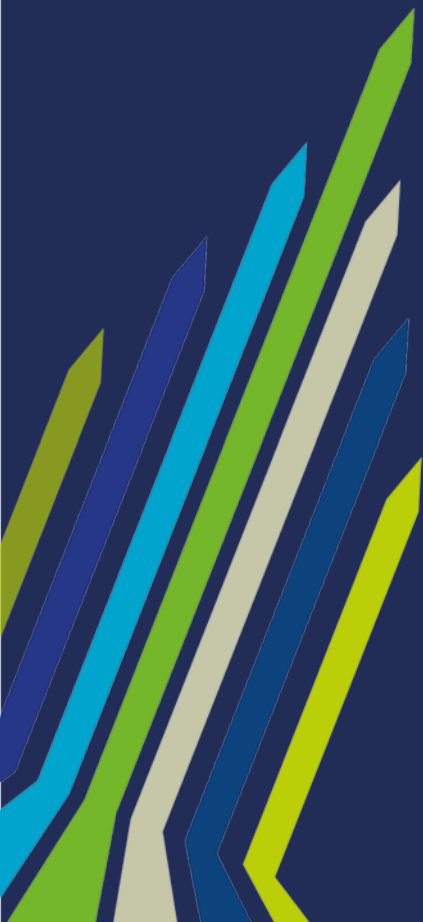


Flight Centric ATC



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Thank you for your attention

More information:

Leticia González
lgmota@indra.es

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Conflict Detection and Resolution Aid to Planner Controller

Roberta Pigliacampo

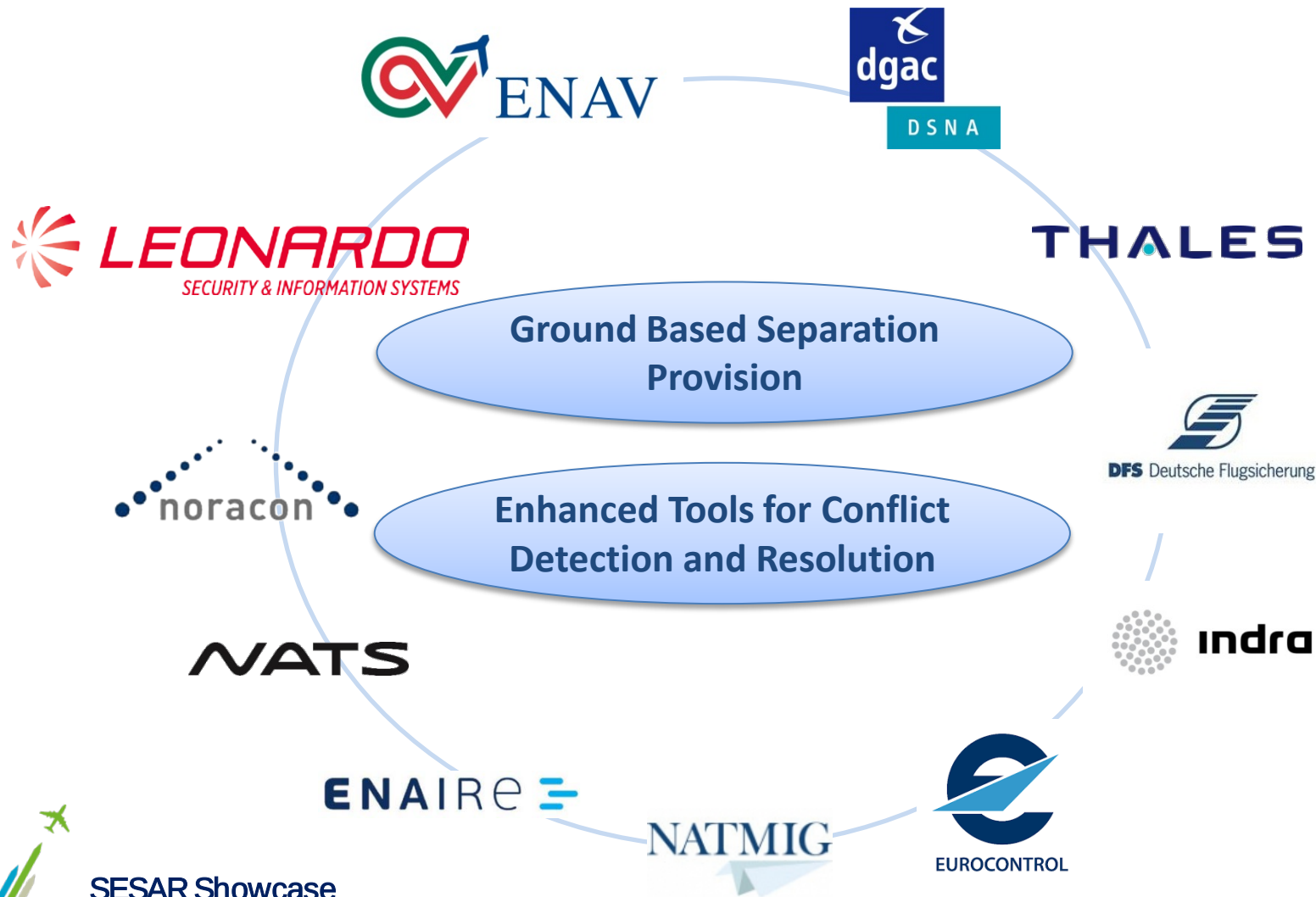
Leonardo-Finmeccanica



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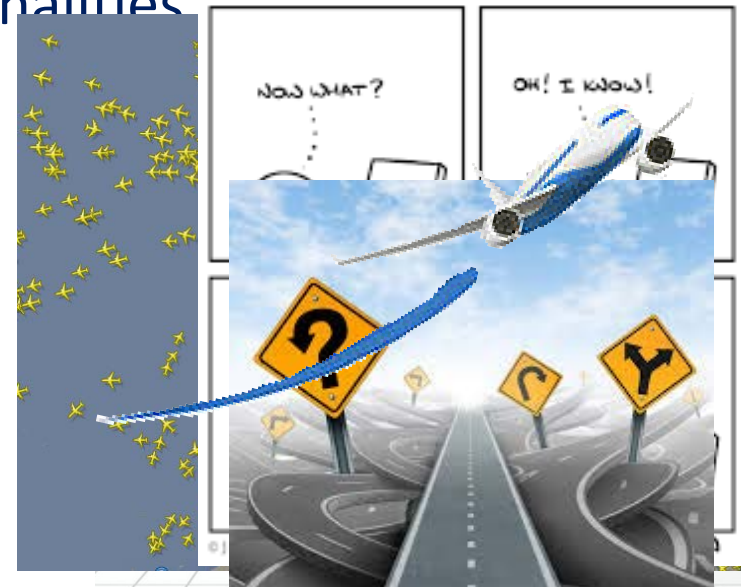
Partners involved



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The challenges before SESAR1

- Traffic demand expected to increase considerably
- Spreading of potential conflicts points or areas
- Limited benefits of existing Conflict Detection Tools
- Limited resolution advisories functionalities



The target solution



Definition and Development of Advanced Conflict Detection and Resolution Tools



Improved accuracy



Improved safety



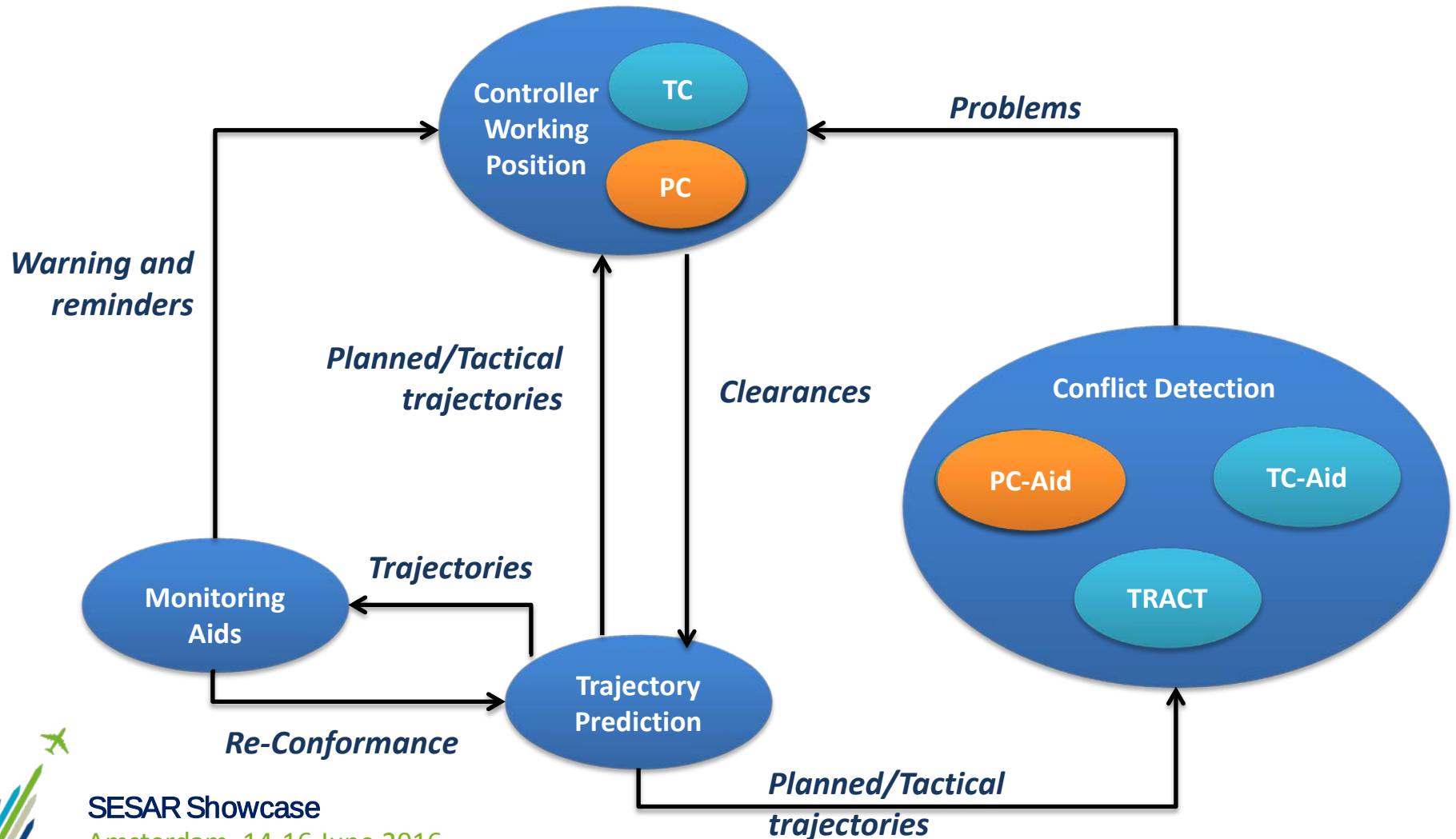
Better use of ATC capacity



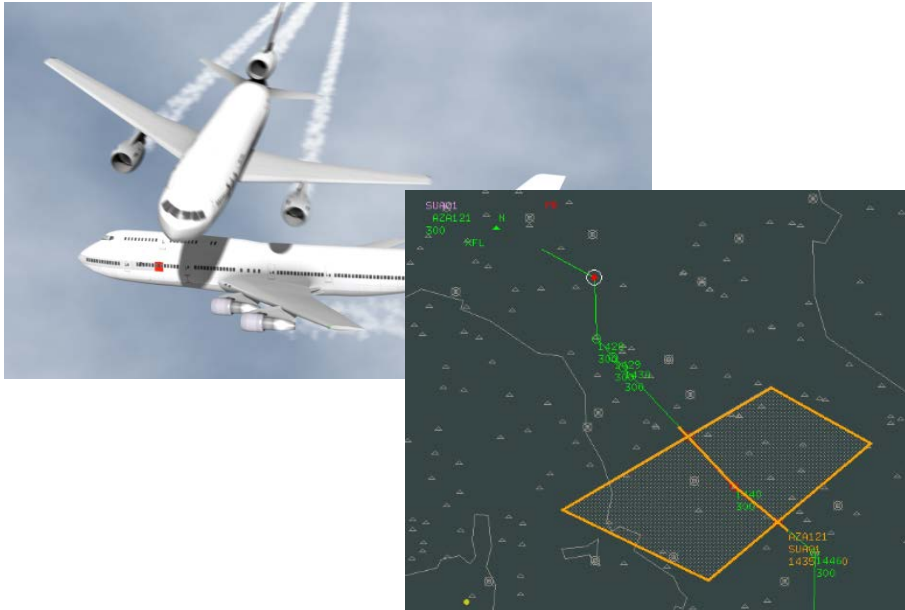
Support in complex situation



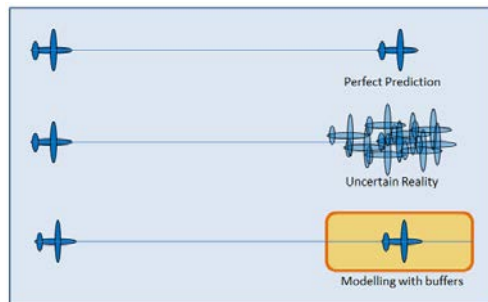
What has been addressed in SESAR1



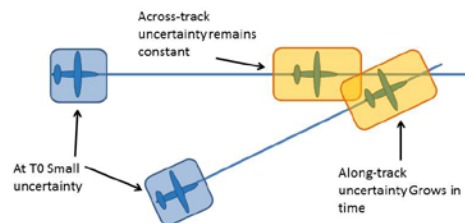
Planning Conflict Detection (1/2)



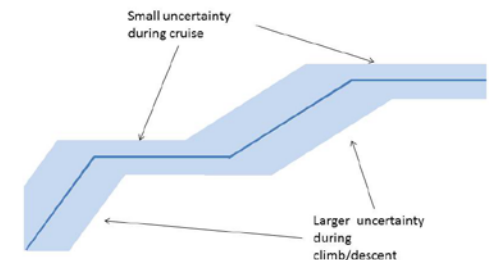
- Aircraft to aircraft encounter
- Aircraft to airspace encounter
- Uncertainty modelling with buffers



Horizontal Uncertainty



Vertical Uncertainty



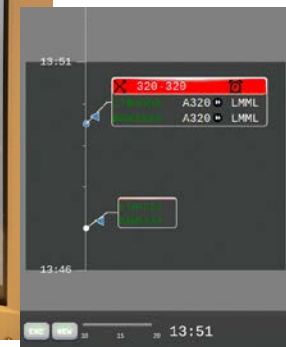
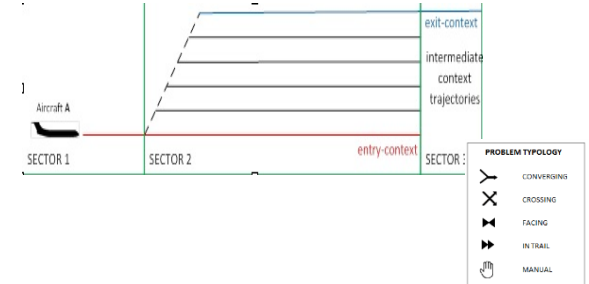
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Planning Conflict Detection (2/2)

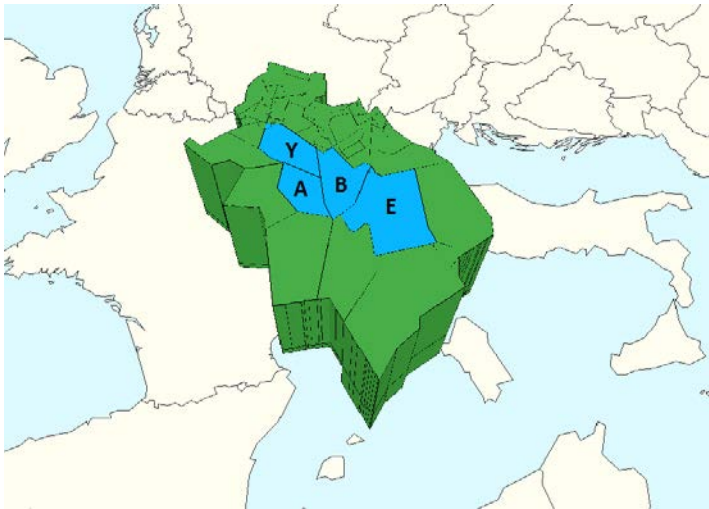
- Encounter classification
- What-if
- Support to team coordination
- HMI enhancements

WHAT IF WE DIE AND
IT TURNS OUT GOD IS
A BIG **CHICKEN**??
WHAT THEN?!

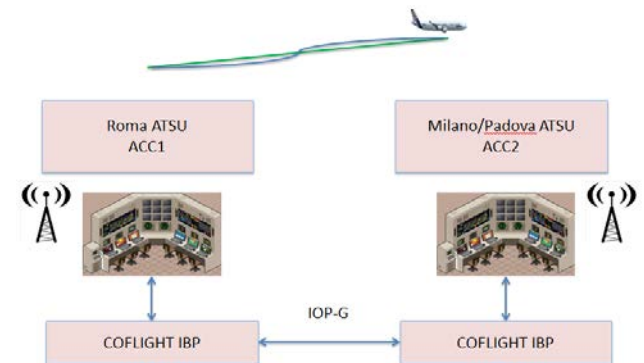
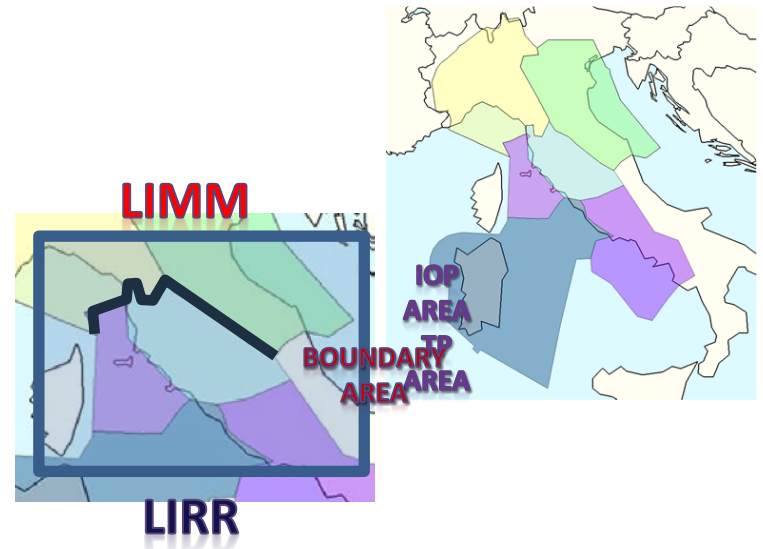


Validation activities

DSNA simulation



ENAV simulation



Early findings and achievements



- Improved situation awareness
- Improved safety
- Dynamic workload distribution
- Support to entry/exit traffic flow management
- Good usability
- Needed for full implementation of Free Routing services

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What remains to do



Improved accuracy



Improved safety



Better use of ATC capacity



Support in complex situation

SESAR 2020



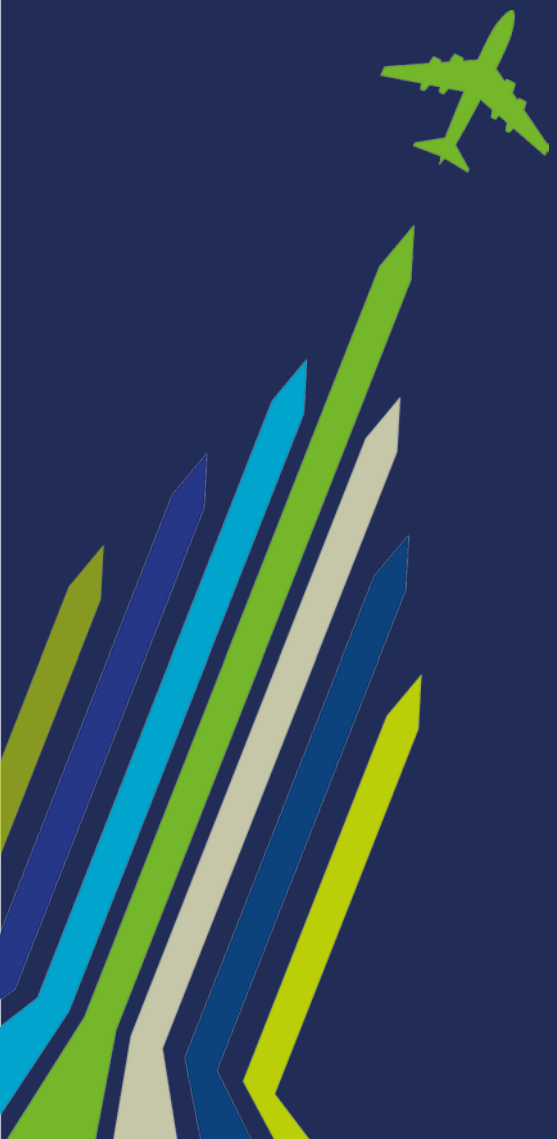
SESAR 2020



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Thank you for your attention

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