SESAR P6.8.1

Flexible and Dynamic Use of Wake Turbulence Separations

Controller tool support, results and interpretation

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Introduction

- Background and Scope
- Controller tool support options
- Simulation results and conclusions
- Impilcations for safety activities

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Time Based Separation

- Background
- Two key elements
  - Rules Change
  - Controller tool support and MOps

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Time Based Separation

- Background
- Two key elements
  - Rules Change
  - **Controller tool support and MOps**

"What am I responsible for?"

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TBS Rules

TBS Calculations

Leader	Follower HH	LM	SS
HH	4	5	6
LM	*	*	3
SS	*	*	*

160kt GSPD

Light wind baseline to derive the time minima

REMAIN 'FIXED'

Leader	Follower HH	UM	LM
HH	90s	113s	135s
LM	60s	60s	68s
SS	60s	60s	60s

(160 + W)kt GSPD

Conditions on the day determine distance separation minima

DETERMINED BY WIND

Leader	Follower HH	LM	SS
HH	3.5Nm	4.4Nm	5.3Nm
LM	2.5Nm	2.5Nm	2.6Nm
SS	2.5Nm	2.5Nm	2.5Nm

CONTROLLER'S RESPONSIBILITY

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Tool Support

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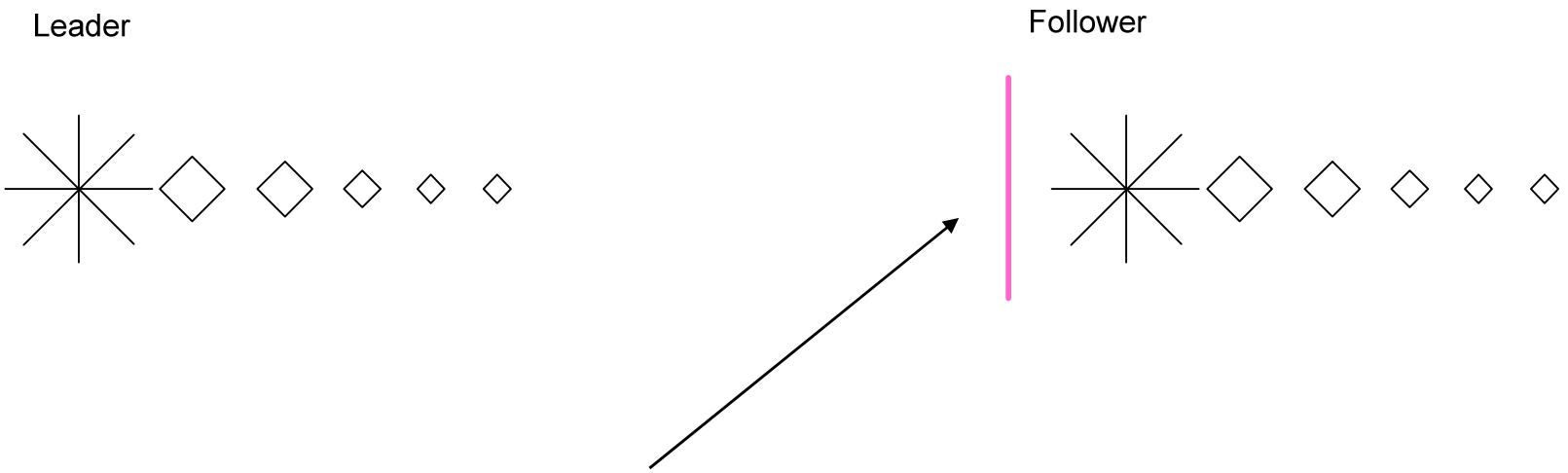
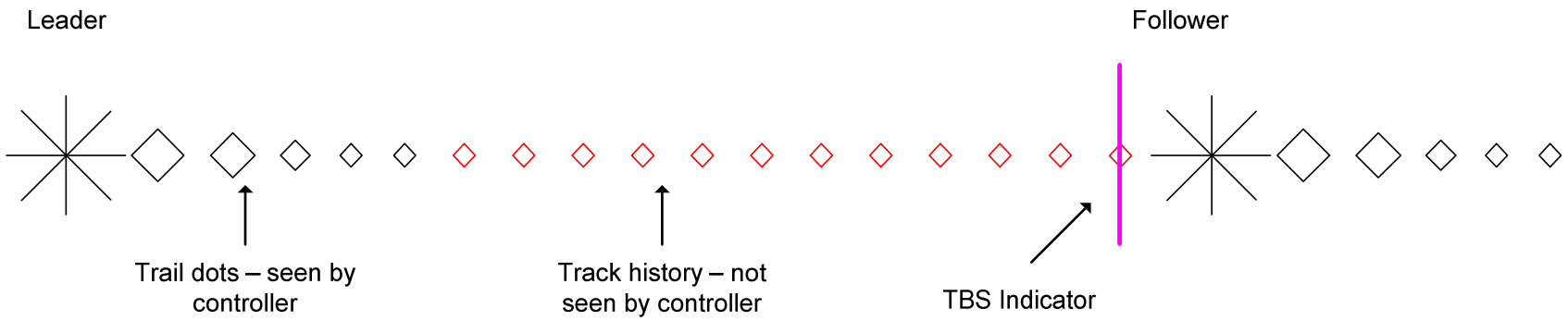
Tool Support – Time Indicator

- Displays time based separation



Time Minimum Calculation

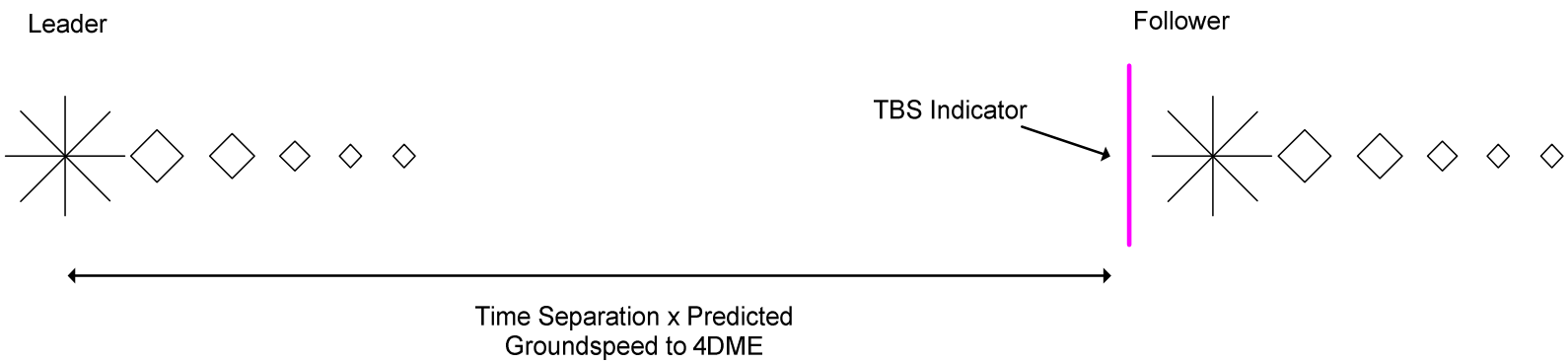
- ‘Track History’
  - “Where was the lead aircraft 68s ago?”
  - Shows time minimum at all times
  - Distance between lead ac and indicator changes



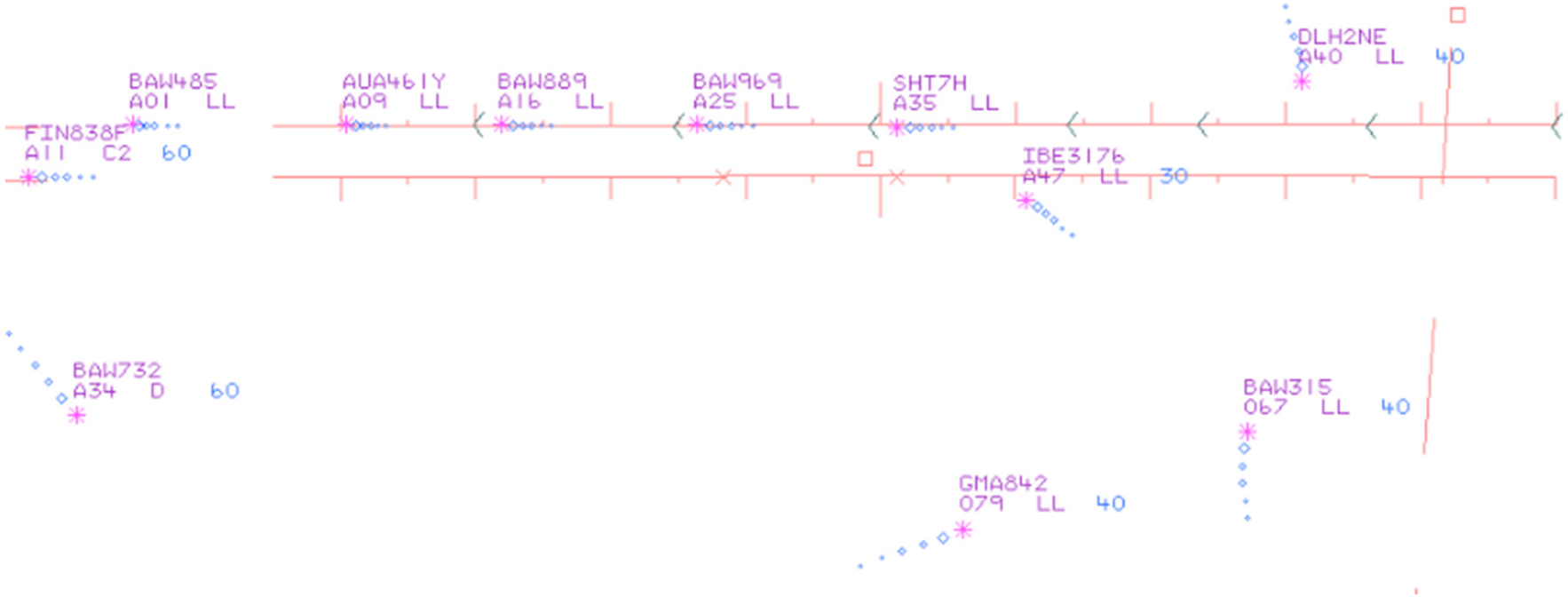
68s = 17 track updates

Time Minimum Calculation

- ‘Fixed’
  - Converts 160kt IAS, wind (~1,500ft) and time minimum into a distance
  - Distance between indicator and indicator remains fixed once activated



TBS FIN Controller Radar Display



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TBS Real Time Simulation: October 2010

- 6 day simulation
- Range of wind conditions
- Tool supported TBS
  - Two options (fixed / track history)
- Radar separation minimum 2.5Nm / 2.0Nm

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Conclusions

- TBS viable with improvements
- Situational Awareness impacted
- Fixed option preferred
  - Essential modifications required
  - Looks like a ‘target’ on ILS join
- Track History option has difficulties
  - Uncertain behaviour (speed)
  - Incompatible with ‘separation’ indicator
  - Better suited to spacing?
- <2.5Nm very challenging with either
- Monitoring for separation difficult

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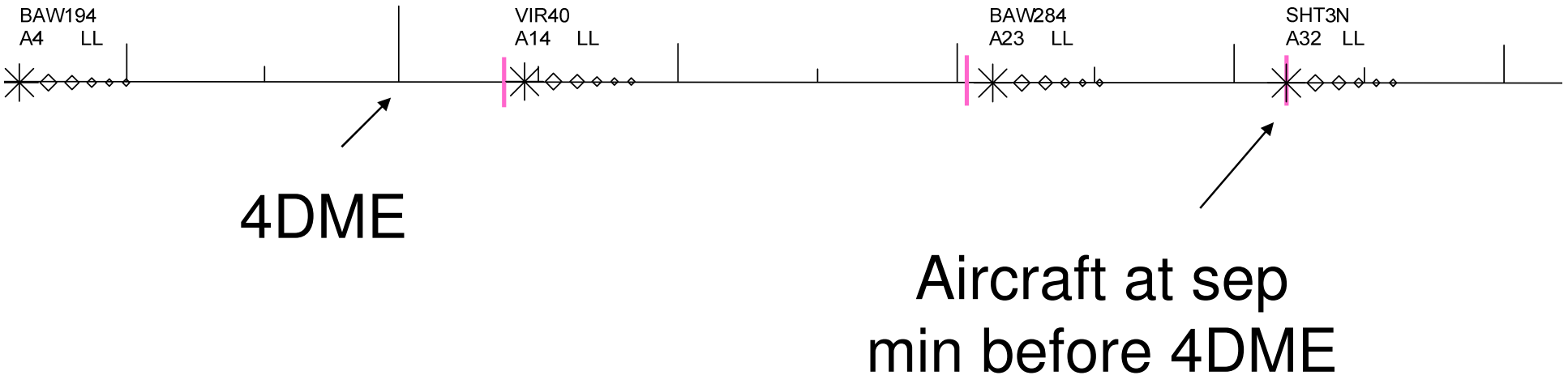
Next Steps

- Fixed indicators **are** TBS indicators
  - P6.8.1 OCD and OSED
  - TC and Tower tool support
- October 2011 TC simulation (EGLL)
- Mid 2012 Tower simulation (EGLL)

Safety Analysis Implications - 1



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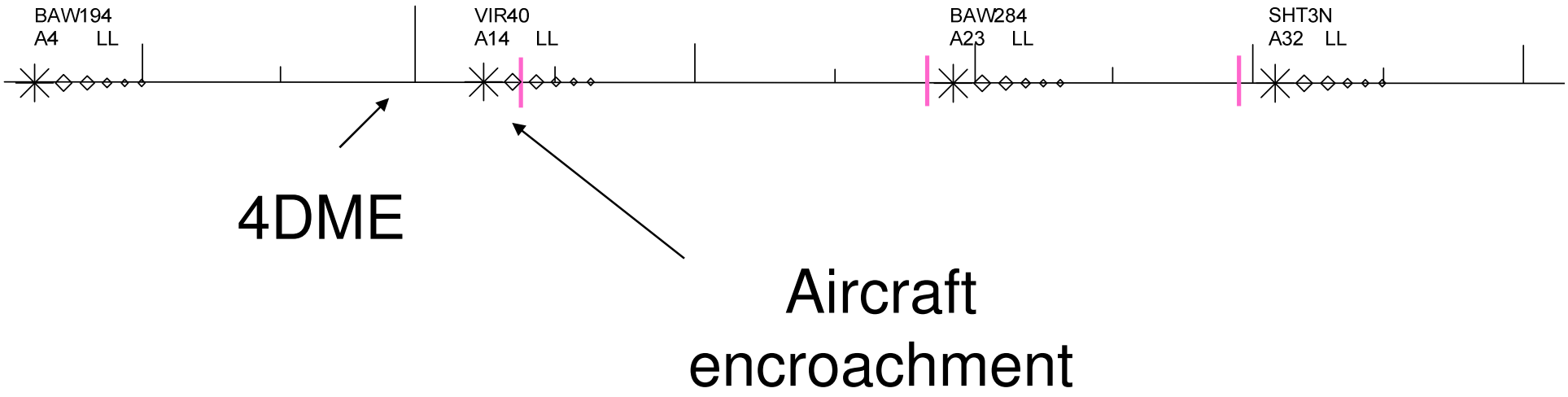
Safety Analysis Implications - 2



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Conclusions

- Concept must be **SAFE** and **USABLE**
- What is TBS?
  - Radar Separation based on time
  - Different DBS in different wind conditions
- Always ask 'what are controllers responsible for'
- Iteration between concept and safety analysis

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Questions?

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