

Smart Sector Grouping EXE4 - Validation Workshop 1

NLR/LFV/LiU



Co-funded by the European Union

FAV3 Input Validation EXE4 Workshop 1; Agenda



- 1. Current optimized roster current sector combinations
- 2. Feasible selected (new) combinations

Smart Sector Grouping & IFAV
 Rostering & Operational

(new) Unit Endorsement Groups

3. Neighbours – all combinations within ATSU

Scenario	Controller s	Switches	Average	Threshold	Peak >=20	COE*	Combi
	minimum (executive)	during shift	controllers per period	maximum taskload	taskload occurances	% worktime @ position	Used combinatio ns
Real	16	x	3.9	31	8	0.62	1
Current opt	9	80	3	25	15	0.67	1
Feasible	8	100	2.84	25	30	0.71	4
Neighbors	8	130	3	25	27	0.76	21
				22% ef	ficiency im	provement	



Optimized Rosters

IFAV3

Background

O Supervis

Panner
 A200

EXE4 Validation Workshop

3 scenario's

feasibility

3.

4.

Useful information

HP & Safety impact

5 Discussion Topics

<image>



Efficiency output

2 ATSU's (2/3 groups)



Online Survey



New Combinations



2

Increased Flexibility of ATCO Validation - En-route



Reduce the **effort required** for Air Traffic Control Officers (ATCOs) to **obtain and maintain flexibility** in **unit endorsements** on specific or more sectors / **sector groups** than today in the **En-route upper airspace**.





Increased Flexibility of ATCO Validation - En-route



4 Strategies within this solution

Supporting tools for controllers to reduce mental strain in unfamiliar sectors;
 Smart Competency Monitoring and Minimum Competency Level Prediction, predicting the required competencies for a more flexible rostering;

3) Smart Sector Groupings proposing more flexible unit endorsement **sector groupings** within a service unit;

4) Common Unit Competence Scheme Framework, establishing a Europe-wide methodology for currency requirements and ensuring safety levels while expanding the number of endorsed sectors for ATCOs.

Partners DLR, NLR, ENAIRE, CRIDA, INECO, ENAV, INDRA, LFV, NATS, UPM, LIU



Increased Flexibility of ATCO Validation - En-route



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IFAV3 Example – Sweden





Smart Sector grouping



IFAV3 Smart Sector Grouping Rules







Data

- Traffic on two days (11 & 12 October, 6AM-9.30PM)
- Current Sectors and (potential) combinations
- Controllers (& Planners)
- Current Unit Endorsements groups / all sectors

Rostering rules

- Maximum shift duration: 8 hours
- Minimum break between shifts: 8 hours
- Breaks: Every 1.5 hours at least 0.5 hour break





- Current Baseline based on combinations that were used that day
- 2. Feasible Extended with other possible combinations that are deemed feasible for an ATCO to efficiently work in
- **3. Neighbours** Including new combinations based on neighbouring sectors but **not** taking into account flow
- 4. IFAV endorsements Next validation



IFAV3 Assessing results: Key Performance Indicators

- Controllers minimum number needed (executive)
- Switches of sector combinations during shift
- Average number of controllers per period
- Threshold maximum task load an ATCO can handle
- **Peak** task load occurrences ≥20
- COE (Coefficient of Efficiency) which we define as the percentage time at work at position







Link to computational results

IFAV3 Results – Stockholm ACC – Day 1

Scenario	Controller	Switches	Average	Threshold	Peak	COE*	Combi
	S				>=20		
	minimum	during	controllers	maximum	taskload	% worktime	Used
	(executive)	shift	per period	taskload	occurances	@ position	combinatio
							ns
Real	16	x	3.9	31	8	0.62	10
Current opt	9	80	3	25	15	0.67	10
Feasible	8	100	2.84	25	30	0.71	47
Neighbors	8	130	3	25	27	0.76	216
22% efficiency improvement							

*Coëfficiënt of Efficiency



IFAV3 Results – Malmö ACC – Day 1

Scenario	Controller	Switches	Average	Threshold	Peak	COE*	Combi
	S				>=20		
	minimum	during	controllers	maximum	taskload	% worktime	Used
	(executive)	shift	per period	taskload	occurances	@ position	combinatio
							ns
Real	17	x	6.4	72	11	0.66	9
Current opt	15	184	4	44	4	0.65	9
Feasible	10	110	3.9	44	5	0.72	22
Neighbors	7	110	2.97	44	11	0.75	198
13% efficiency improvement							

*Coëfficiënt of Efficiency



IFAV3 Summary Survey



Unit Endorsment

Useful information

Rostering & Operational Feasibility





Scenario Preference

36.11%

22.22%

Demographics Age: 40-60+ Years of experience: 10-20+ Background: 5 ESOS, 4 ESMM

6 Sup., 4 Plan., 1 G.Man.

■ Current ■ Feasible ■ Neighbours

41.67%



FAV3 Summary Validation EXE4 Workshop 1

- Smart Sector Grouping
 - SSG can improve efficiency & support future unit endorsement grouping
 - Traffic flow is essential
- Rostering efficiency
 - Reduce switches and implement hand over time
 - Balance flexibility & safety is key
 - Tooling can be helpful
- Unit Endorsement Grouping
 - Stockholm: current endorsements groups are effective.
 - Malmö: already IFAV/overlapping controllers, suggestions for new balanced endorsement groups
- Next:
 - Inter ATSU: Integrate rosters Stockholm & Malmo centres with IFAV controllers on bordering sectors low complexity (evening)









Thank you for your attention!



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