POLISH AIR NAVIGATION SERVICES AGENCY

POLFRA

Polish Free Route Airspace in FIR EPWW

Report from Real Time Simulation (RTS) performed between 20-22.12.2017 and 03-04.01.2018

Strategic Planning Department ASM1

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Abstract The purpose of this document is to summarize Real Time Simulation (RTS) of the POLFRA -Free Route Airspace project in FIR EPWW, which took place on 20-22.12.2017 and 03-04.01.2018 using the ATS Personnel Training Centre simulator.		
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1 Introduction

Between 20-22 December, 2017 and 3-4 January, 2018,at the PANSA ATS Personnel Training Center, a Real Time Simulation (RTS) regarding the introduction of Free Route Airspace (FRA) took place. 18 ACC Warszawa air traffic controllers selected on the basis of their operational experience, from 1 year to 26 years of controller operational work, took part in the simulation . The arithmetic mean number of years of work as a controller among the simulation participants was around 11 years (11.34 in the first simulation phase, 10.58 in the second simulation phase).

The objective of the simulation was to verify the POLFRA operational concept (approved in October 2017), in particular to confirm the horizontal boundaries of the FRA (establishing the POLFRA lower boundary) and the structure of the designed airspace (entry and exit points, restrictions and required intermediate points). As a part of the airspace simulation, the influence of FRA was tested on: controller's work, creation of possible hot-spots, coordination between sectors, channelling of the departures from / arrivals to aerodromes located in FIR EPWW and adjacent to FIR EPWW, impact on climb and descent profiles, workload, intensity and complexity of the traffic.

2 Objectives

In order to resemble the reality as closely as possible, the exercises were prepared on the basis of real historical samples of air traffic from summer period of 2017 when the air traffic reached its peak. The following hours were selected, as the traffic load was the highest at that time:

01.07.2017 1300-1400 UTC
07.07.2017 1300-1400 UTC
31.07.2017 1230-1330 UTC (sample with an increased number of arrivals/departures to/from EDDB/EDDT)

Traffic samples were prepared in two versions with the POLFRA from the FL95 and from the FL305

.

The traffic in the samples was increased in accordance with up to date STATFOR predictions for 2018 – HIGH variant, with increase in traffic of 5-6% y/y, depending on the traffic sample.

Flight plans from historical traffic have been modified according to the POLFRA operational concept including the restrictions agreed with the ACC Warszawa team in the process of designing the POLFRA space.

In each hour's exercise the most frequently activated areas in FIR EPWW were introduced with all available height ranges, i.e..: TSA01 A, B, C (in the range FL095-FL660); TSA02 A, I (GND-FL285); TSA02 B, C, D, F, J (GND-FL660); TSA02 E (A023-FL195); TSA02 G (A050-FL265); TSA02 H (A065-FL195); TSA06 A, B, C, D, E, F (FL095-FL660); TSA06 G (FL095-FL135); TSA08 A, C, D, E (GND-FL245); TSA08 B (FL135-FL245); TSA08 G, F (A065-FL245); D53 (GND - 49300ft AMSL / FL495). A continuously active area R 40 (GND-FL660) was introduced as well.

The simulations were carried out in one-hour time blocks - in a 8 sectors layouts managed by ACC Warszawa controllers cooperating with each other, working in pairs of Executive Controller (EC) and

Planning Controller (PC). The remaining sectors, TMA and the ones neighbouring with FIR EPWW were operated by the so-called Feeders.

On the first day of the simulation, the following historical configurations were used:

7E2X	**8X3X (Layout A)**	**8X3X (Layout B)**
BD low	B low	C low
T low	BFGN high	D low
C low	NE low	J low
FG low	FG low	R low
NE low	DTC high	T low
R low	D low	DTC high
J low	C low	EJR high

The following settings were introduced on the second day in order to increase the workload of the controllers:

7E	**4E3X**	**5N3X**
BD	BD low	BFGN high
T	BFGN high	BD low
C	FGNE low	J low
FG	DTC high	R low
NE	TC low	TC low
R	JR low	DTC high
J	EJR high	EJR high
FEEDER	FEEDER	FEEDER

The following settings were introduced on the third, fourth and the fifth day:

7E	**4F3X**	**5N2X**
BD	BD low	NFIR high (DBFGN high)
T	BFGN high	BD low
C	FGN low	J low
FG	DTC high	R low
NE	TC low	TC low
R	EJR low	FGNE low
J	EJR high	SFIR high (TCEJR high)
FEEDER	FEEDER	FEEDER

Thanks to the configuration changes, it was possible to test the POLFRA environment in conditions of increased traffic, that exceeded the determined values of the sector capacity.

The controllers changed positions in each exercise to be able to test work in different sectors and at different positions (EC or PC).

A total of 10 hours of training were held on 20-22 December 2017 (8 exercises with FRA from FL 95 and 2 exercises with FRA from FL305) and 6 hours of exercises on 03-04 January 2018 with the participation of Eurocontrol and the Polish Civil Aviation Authority (5 exercises with FRA from FL 95 and 1 exercise with FRA from FL305).

After each exercise, surveys regarding the occurrence of significant hot spots or safety issues and the need to introduce additional intermediate points / channelling were collected.

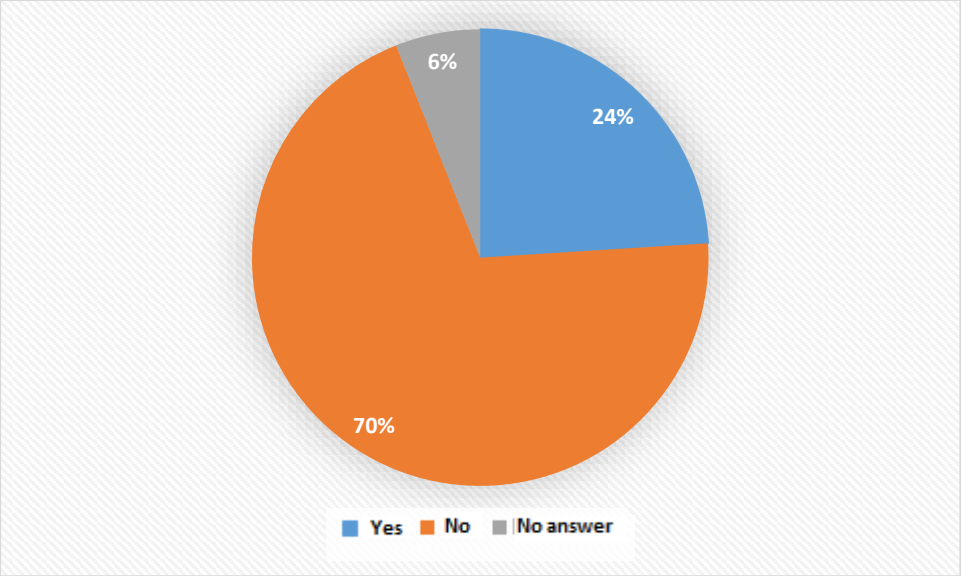
After each exercise block (20-22 December 2017 and 03-04 January 2018), summary surveys were collected.

3 Surveys' results

As a part of the simulation, 164 surveys were obtained after the individual exercises and 30 collective surveys after two blocks of exercises (20-22 December 2017 and 03-04 January 2018).

3.1 SURVEYS AFTER THE EXERCISES

3.1.1 Have you noticed significant hotspots or safety issues?



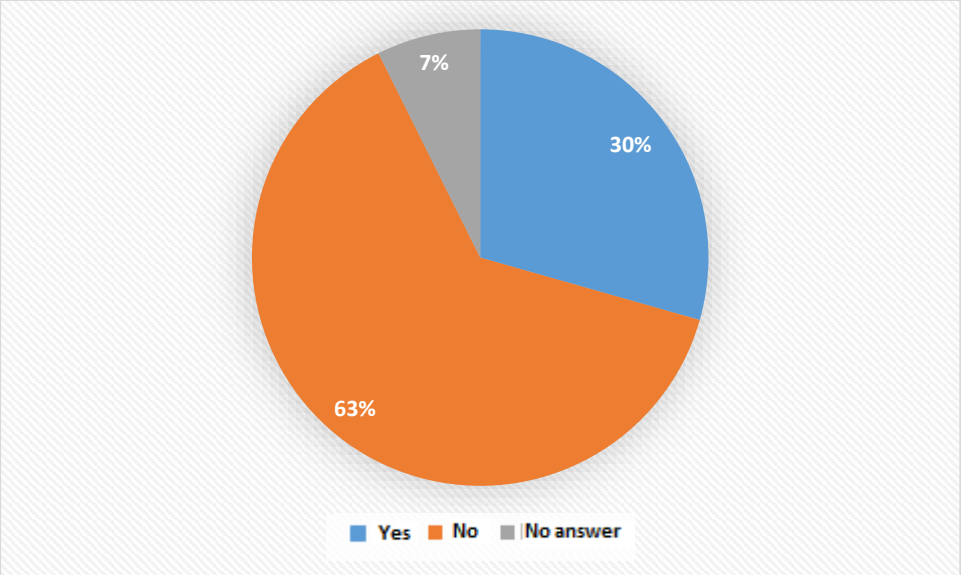


Chart 1. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

In open-ended questions, it was often pointed out that hot spots are created in the same places as in the ATS route network environment and that the FRA has no additional impact on the generation of the hot spots. "FRA without influence onthe creation of HS", "Standard. FRA without influence on these hot spots.","At 20 a/c on frequency there will always be something in conflict "," FRA without influence on the existence of the HS "," Hot spot was not caused by FRA. "," Wrocław area, what always goes. ", " Standard hot spots, no remarks. "," Traditionally Wroclaw and Lodz. "," Natural Hot Spots while avoiding the areas*".*

In addition, there was one remark that "Airplanes avoiding areas, sometimes change their direction rapidly, but this is predictable, so OK.*"*

3.1.2 Was the number of INTERMEDIATE waypoints sufficient to manage the traffic?

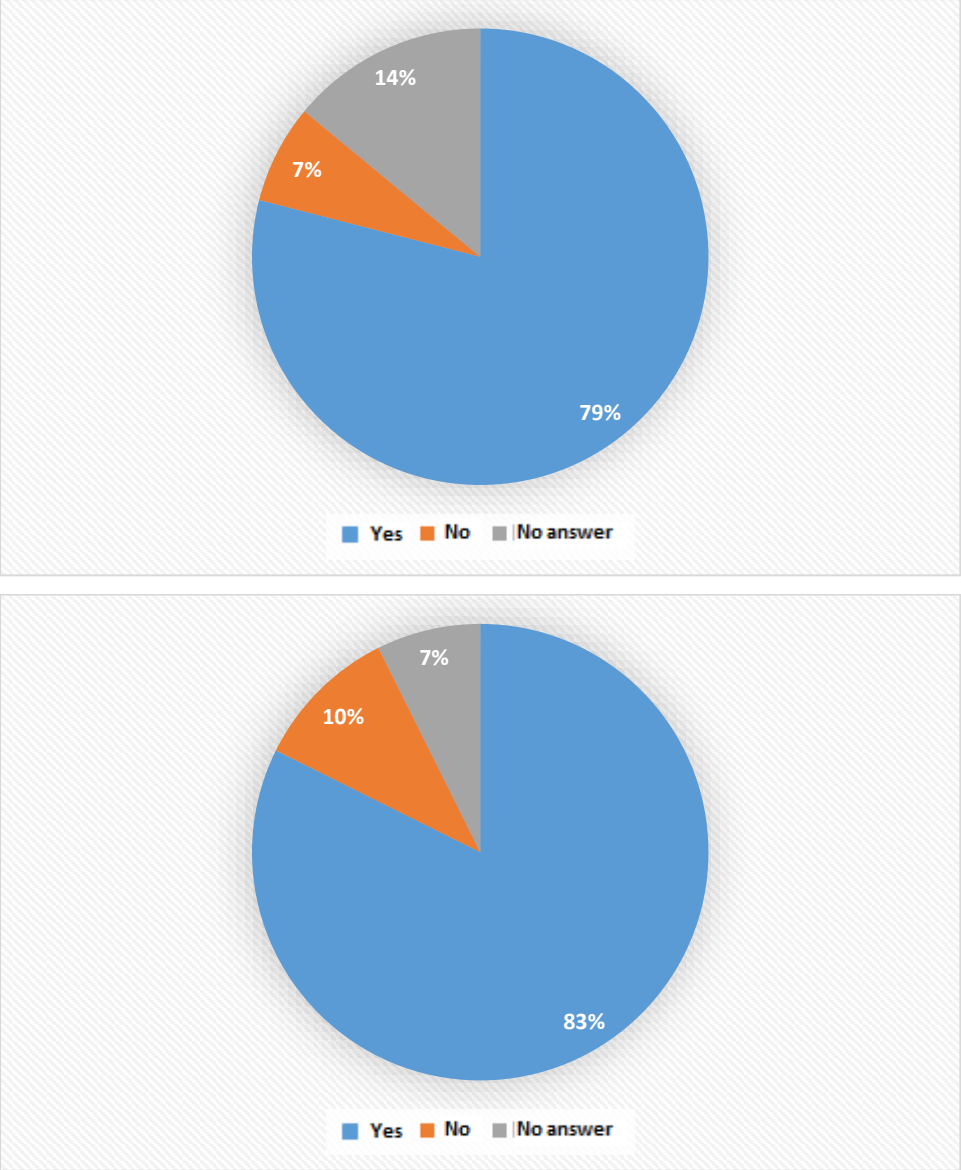


Chart 2. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

In the case of the NO answer, in an open-ended questions participants indicated that the flight trajectories were not correct. Some of them resulted from problems with the simulator despite correct flight plans in the system (incorrect FL at the FIR boundary in regards to the departures from Berlin and Prague), , some of them from errors in conversion of the database to / from the simulator. All of them have been analysed and have no impact on the operational concept or proposed restrictions.

The third category were flight plans that required additional restrictions to channel the traffic. All comments from this category have been collected and will be analysed along with the POLFRA working team.

3.2 AIR TRAFFIC CONTROL IN THE EXERCISE

3.2.1 Were you able to have full control over air traffic?

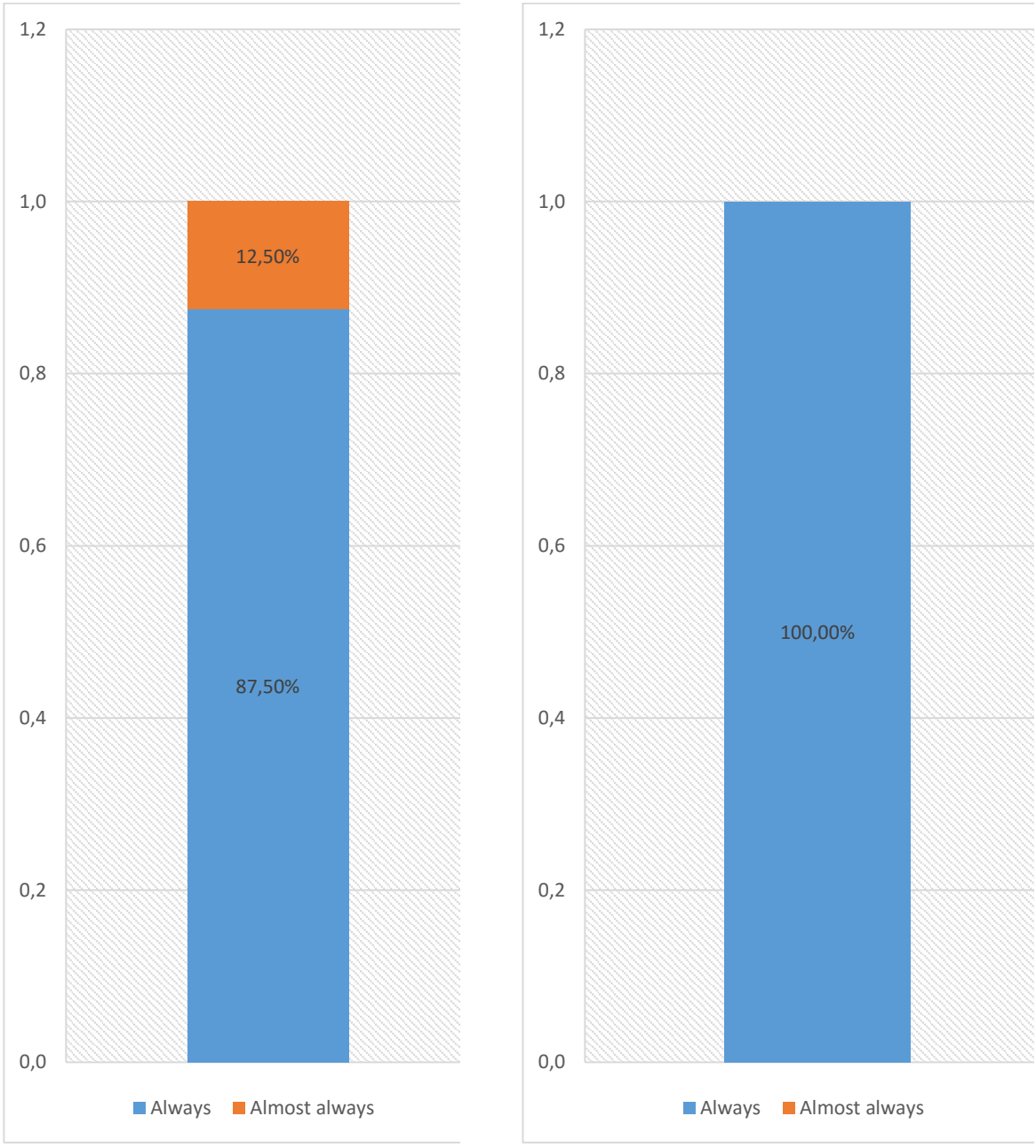


Chart 3. Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.2.2 Have you received STCA, MTCD or APW alerts?

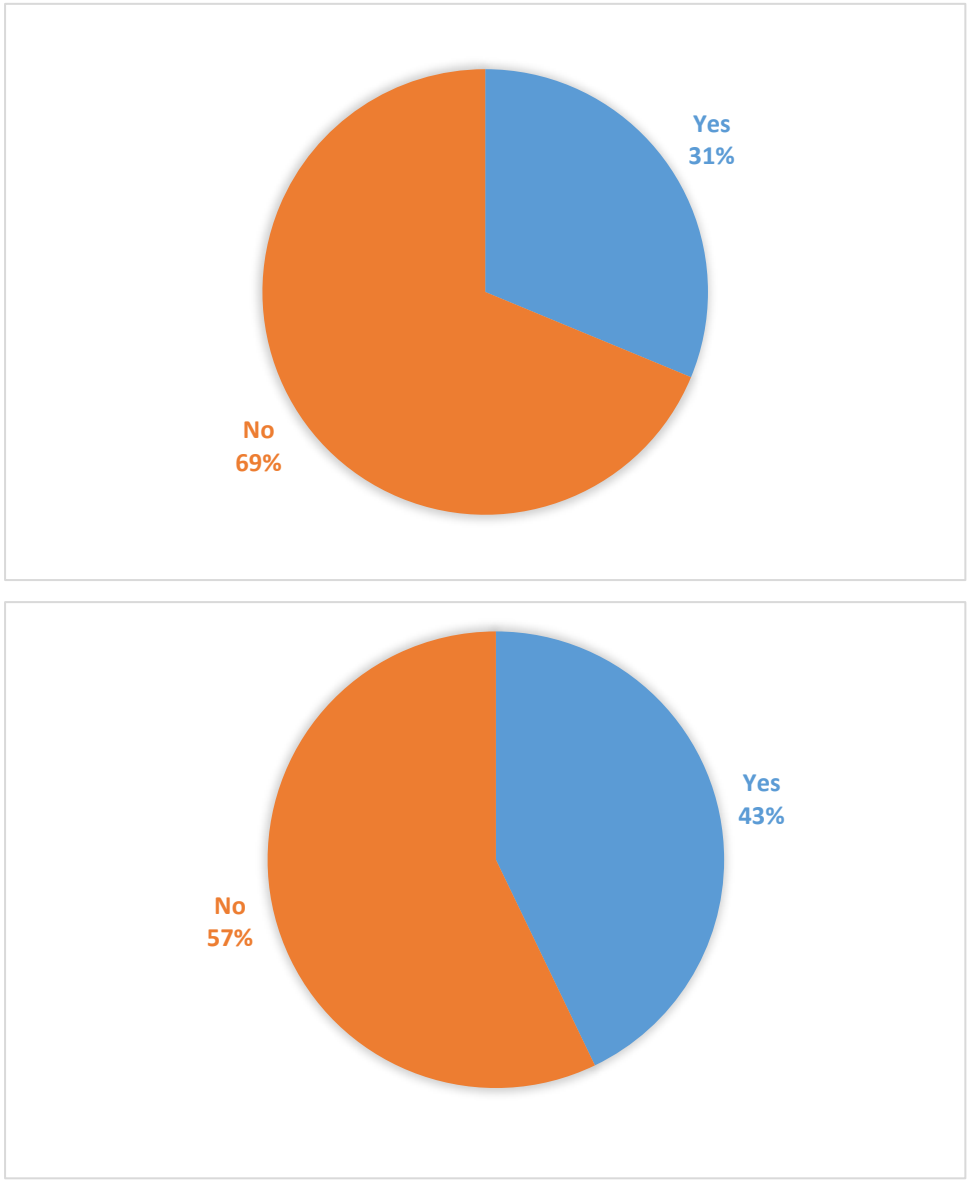


Chart 4. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

The greater number of YES answers in the second phase of the simulation could have resulted from the increase of traffic in subsequent exercises. The alerts, in the opinions expressed in the open question, worked correctly. In most cases, Medium Term Collision Detection (MTCD) and APW (Area Proximity Warning) alerts were activated. "MTCD alarms, appeared correctly", "Unavoidable.", "Alarms were correct", "APW, because zones were setting off" "MTCD. The functions worked properly, unrelated to Free Route Airspace. "," Situations were unavoidable. "," Areas generate alerts 10 min before activation, but this is normal. "," APW with cone (EP R40) and D53 alerts just before activation.”

3.2.3 How often did you feel that you could plan and conduct your work the way you would like to?

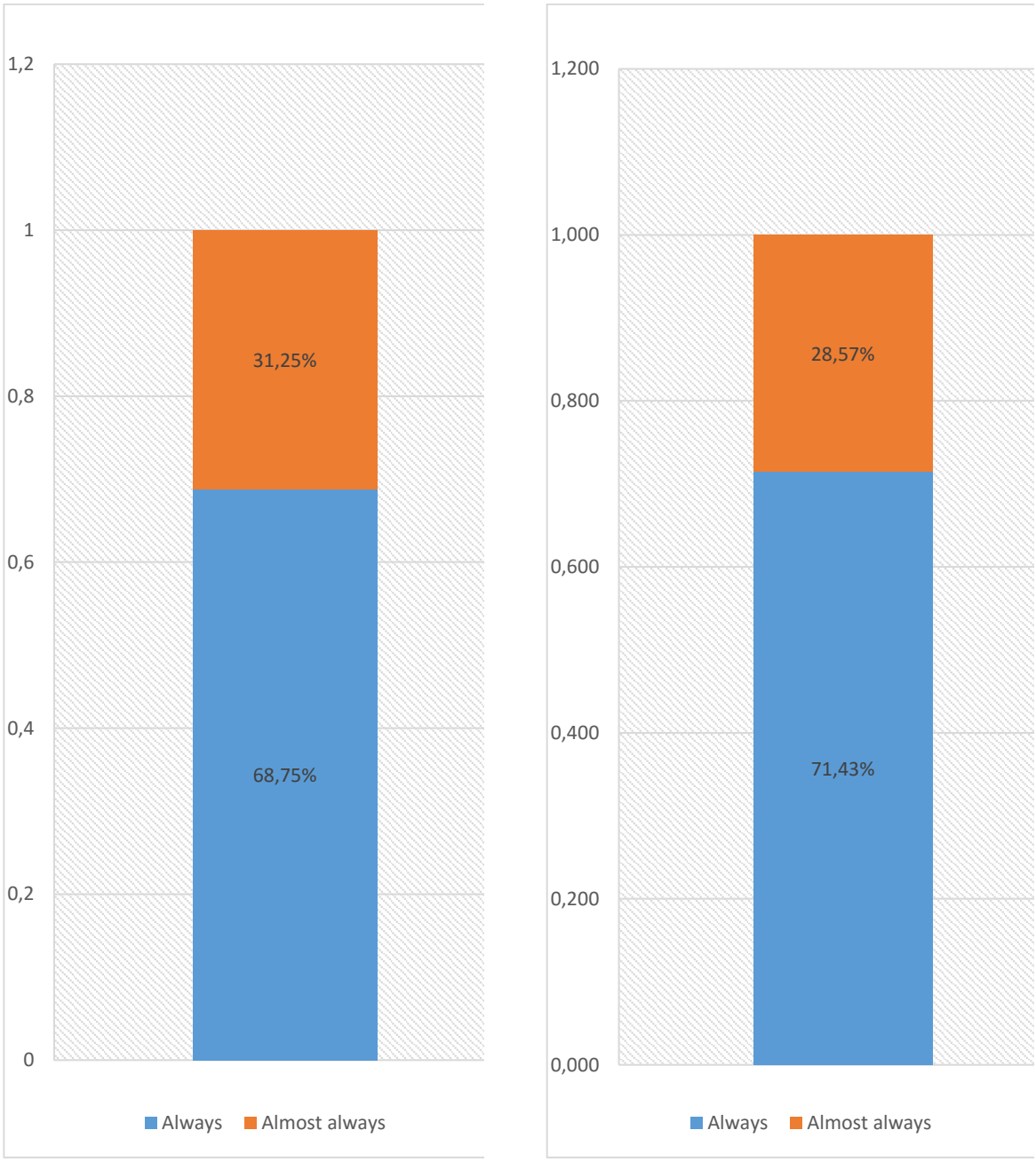


Chart 5. Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.2.4 How often did you feel that you are able to predict the changing traffic situation?

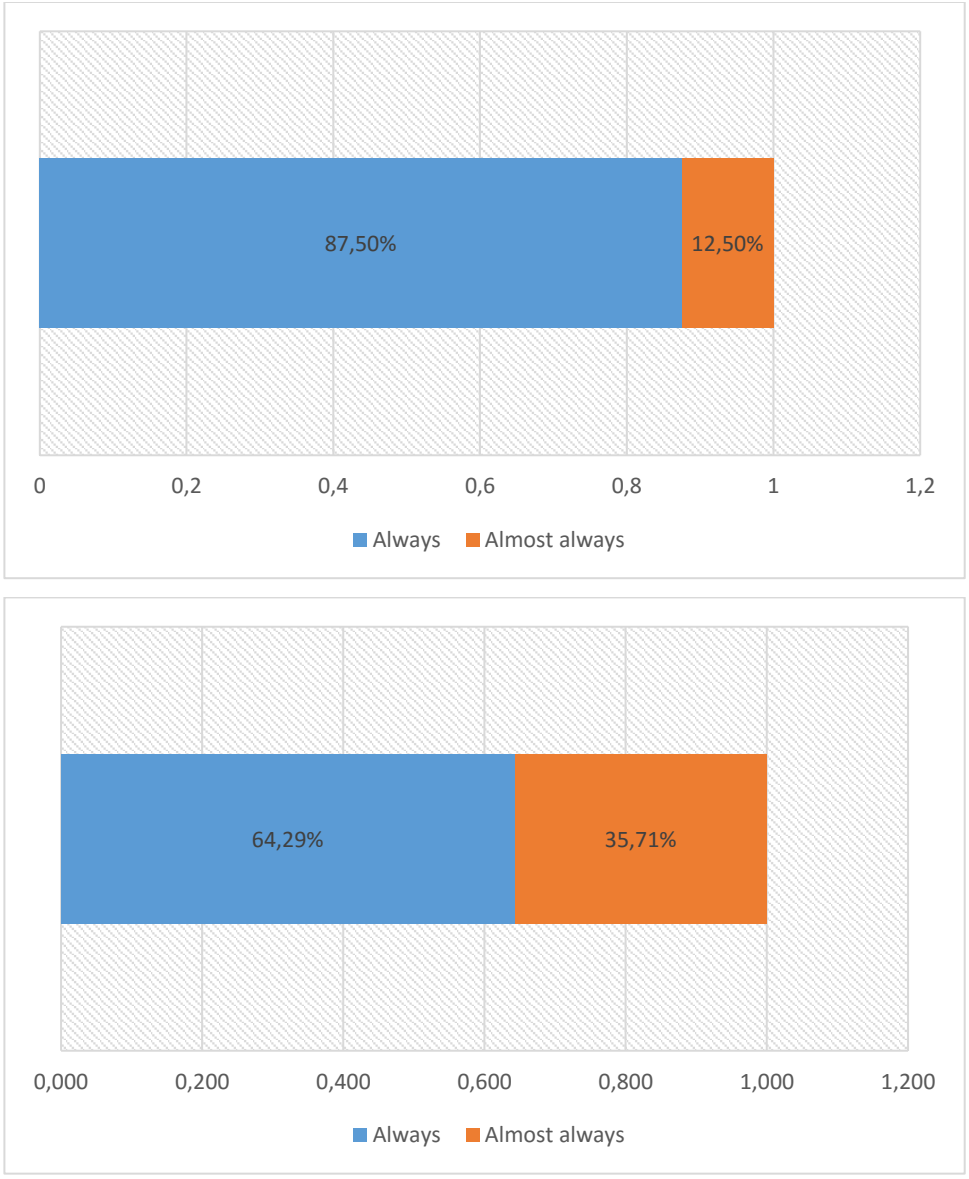


Chart 6. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

3.2.5 Did you get the impression that you are focusing too much on a new problem or/and a part of the sector?

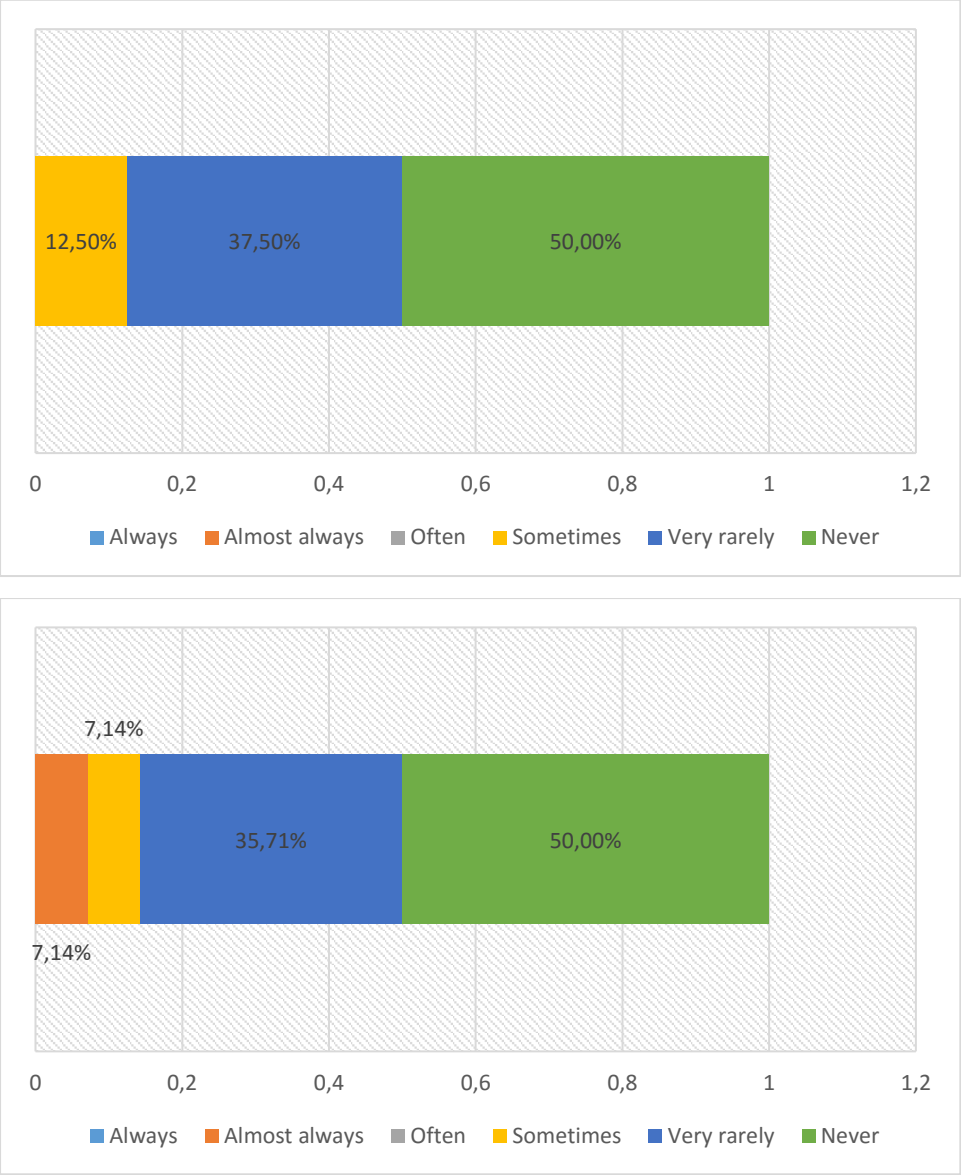


Chart 7. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

The respondents believed that they had control over the air traffic in the exercise, they could always or almost always plan and conduct the their work as they wanted to and anticipate the changes in traffic. The controllers believed that the traffic in the exercises was predictable or very predictable. In the open question, it was indicated that "The essence of simulation practically does not deviate from work with real air traffic. I do not think that the idea of a free route would complicate the traffic situation.”

In the case of focusing too much on a new problem and/or part of the sector, the answers such as "Never" and "Very rarely" were the most common (over 85% in total in both summary surveys). The answer "Almost always" was marked by 1 person who also participated in the first phase of the

simulation and did not indicate that answer then. It was highlighted that "problems with learning the EP R40 area levels at individual flight levels occur" and " if there are more than 2 hot-spots in the sector, it might be distracting.”

3.2.6 How predictable was the traffic in the exercises?

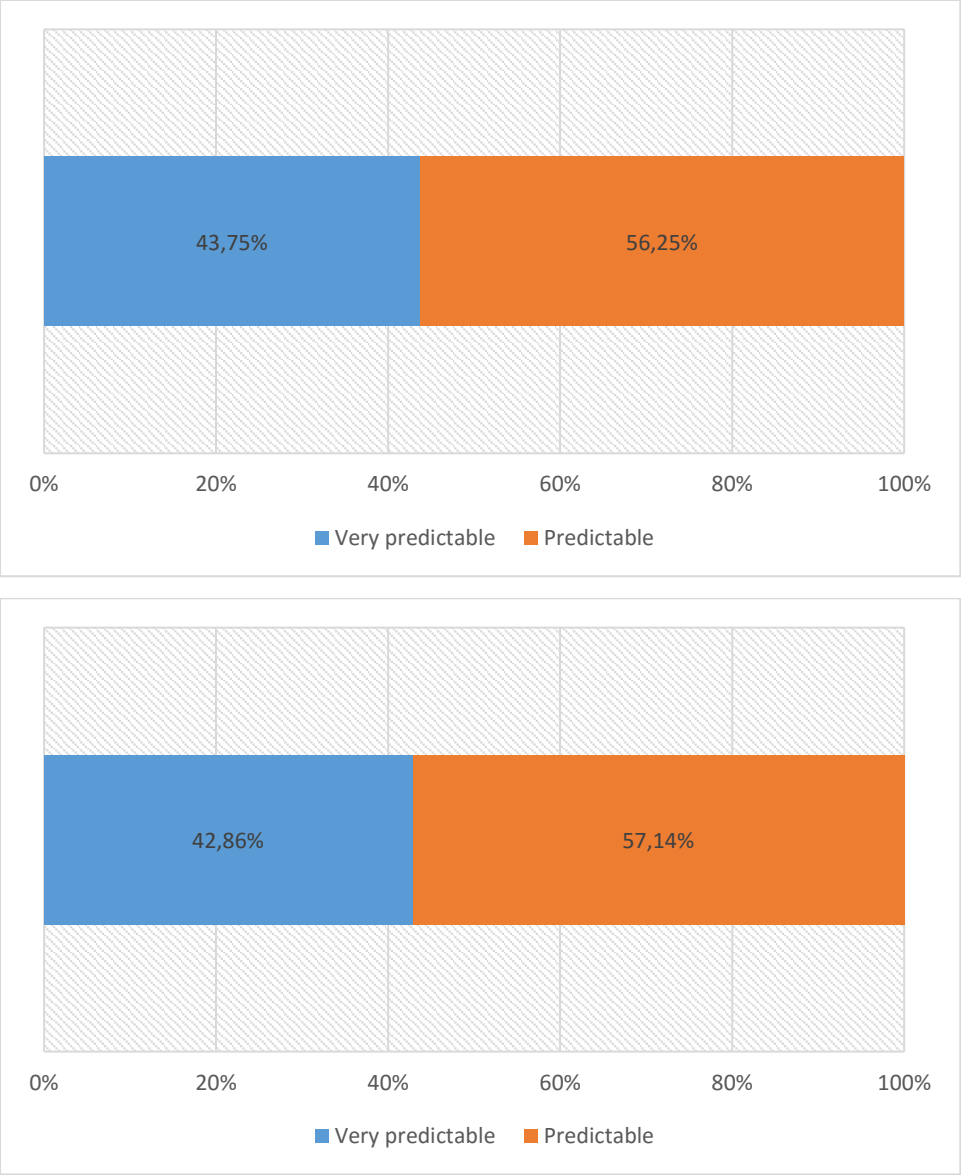


Chart 8. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

3.3 WORKLOAD AND TRAFFIC INTENSITY

3.3.1 How do you rate the average traffic intensity in proportion to the sector capacity?

Average traffic intensity in proportion to the sector capacity (mean value from questionnaires - simulations 20-22.12.2017): **67%**

Average traffic intensity in proportion to the sector capacity (mean value from questionnaires - simulations 03-04.01.2018): **78%**

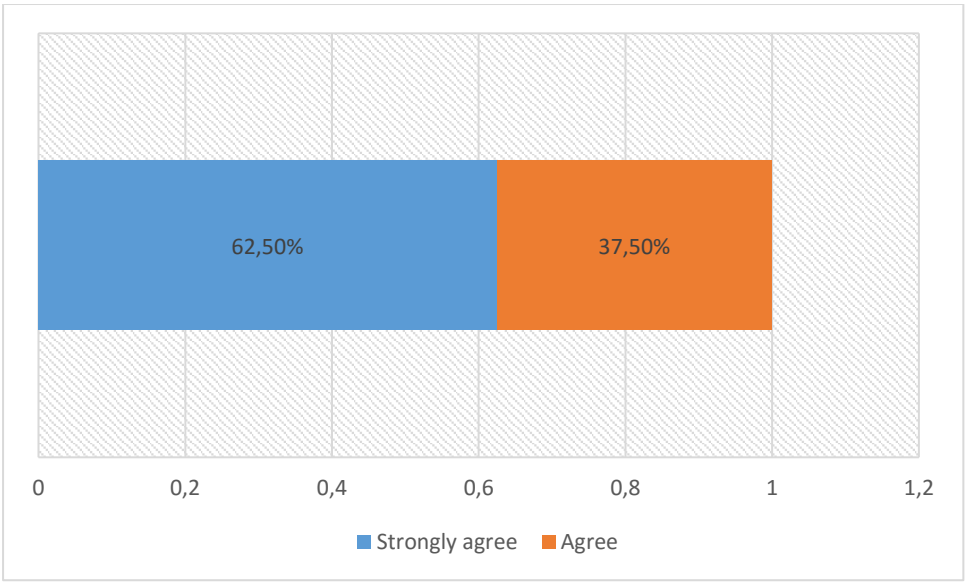
3.3.2 How do you evaluate the highest intensity of traffic in proportion to the sector capacity?

The highest traffic intensity in proportion to the sector capacity: 92% (mean value from questionnaires - 20-22.12.2017 simulations**, 3 participants answered "above the capacity"**: they were included in the average as 110%*).*

The highest traffic intensity in proportion to the sector capacity: 102% (mean value from questionnaires - 03-04.01.2018 simulations , **7 participants answered "above the capacity"**: they were included in the average as 110*%).*

The increase in the average and the highest traffic intensity in the second part of the simulation was related to configuration changes, aimed at increasing the controller's workload above the set currentvalues in FIR EPWW. This was to test the POLFRA environment in difficult traffic situations.

3.3.3 Was the workload acceptable?



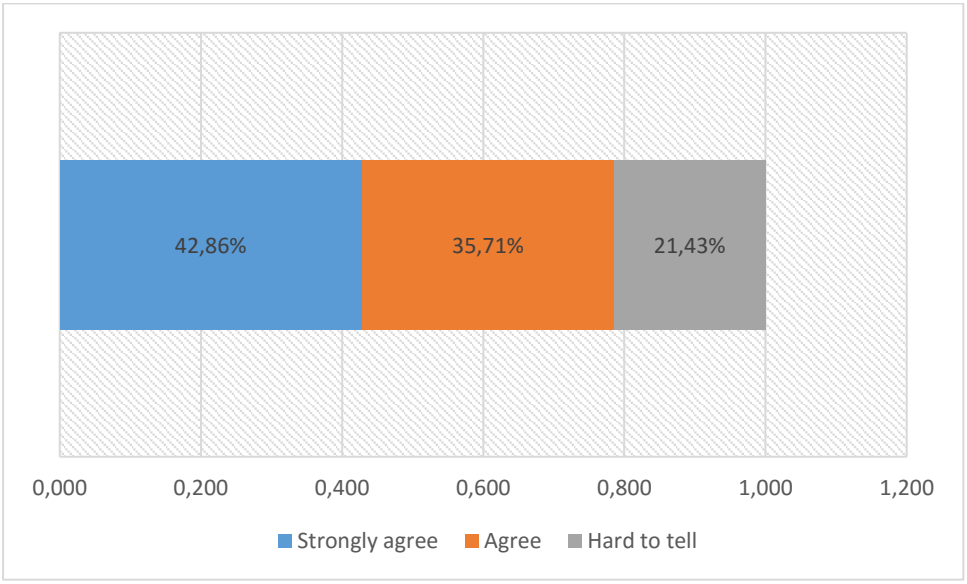


Chart 9. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

The "Hard to tell" answer may be related to the increase of traffic over the value of the sector capacity, resulting from changes in sector configurations during the second part of the simulation.

3.3.4 **Which factors influenced the workload the most?**

1 (1,67/1,31)	**Traffic intensity**
2 (2,33/2,31)	**TSA/D/R zones activation**
3 (2,33/2,46)	**Traffic complexity**
4 (4,00/4,30)	**Vertical coordination**
5 (4,67/4,77)	**Sequencing**
6 (6,00/5,69)	**FRA environment**

*The ratings were presented in a form of a scale of 1- **the strongest**, and 6 - **the weakest**, only one value could be assigned to each factor.*

Table 1. Mean values from the responses in questionnaires. In brackets: first - mean value from 20-22.12.2017simulation, second - mean value from 03-04.01.2017simulation.

The FRA environment has been indicated as the factor which has the least impact on the workload of the respondents.

3.3.5 What effect did the introduction of the FRA environment have on your workload?

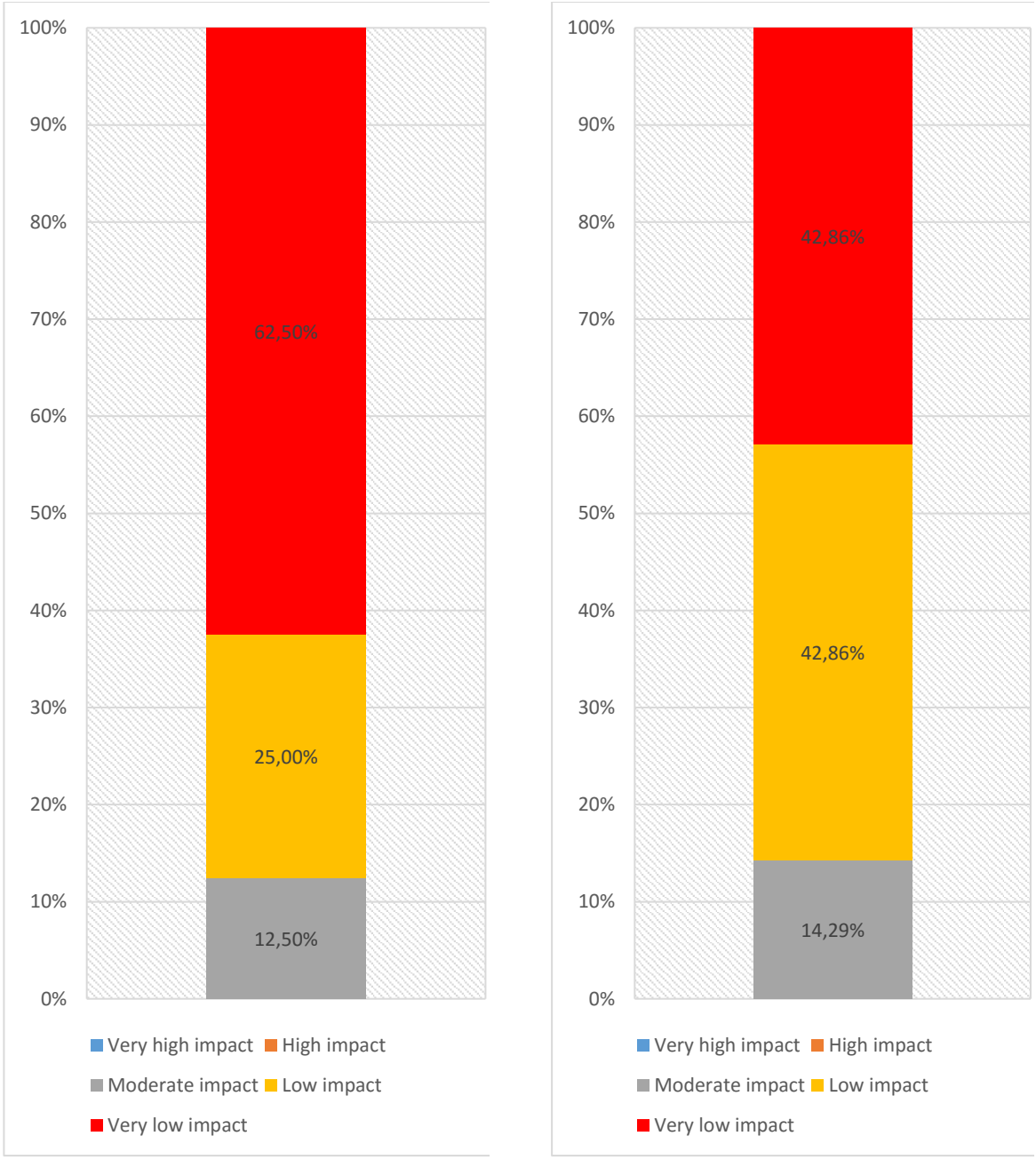
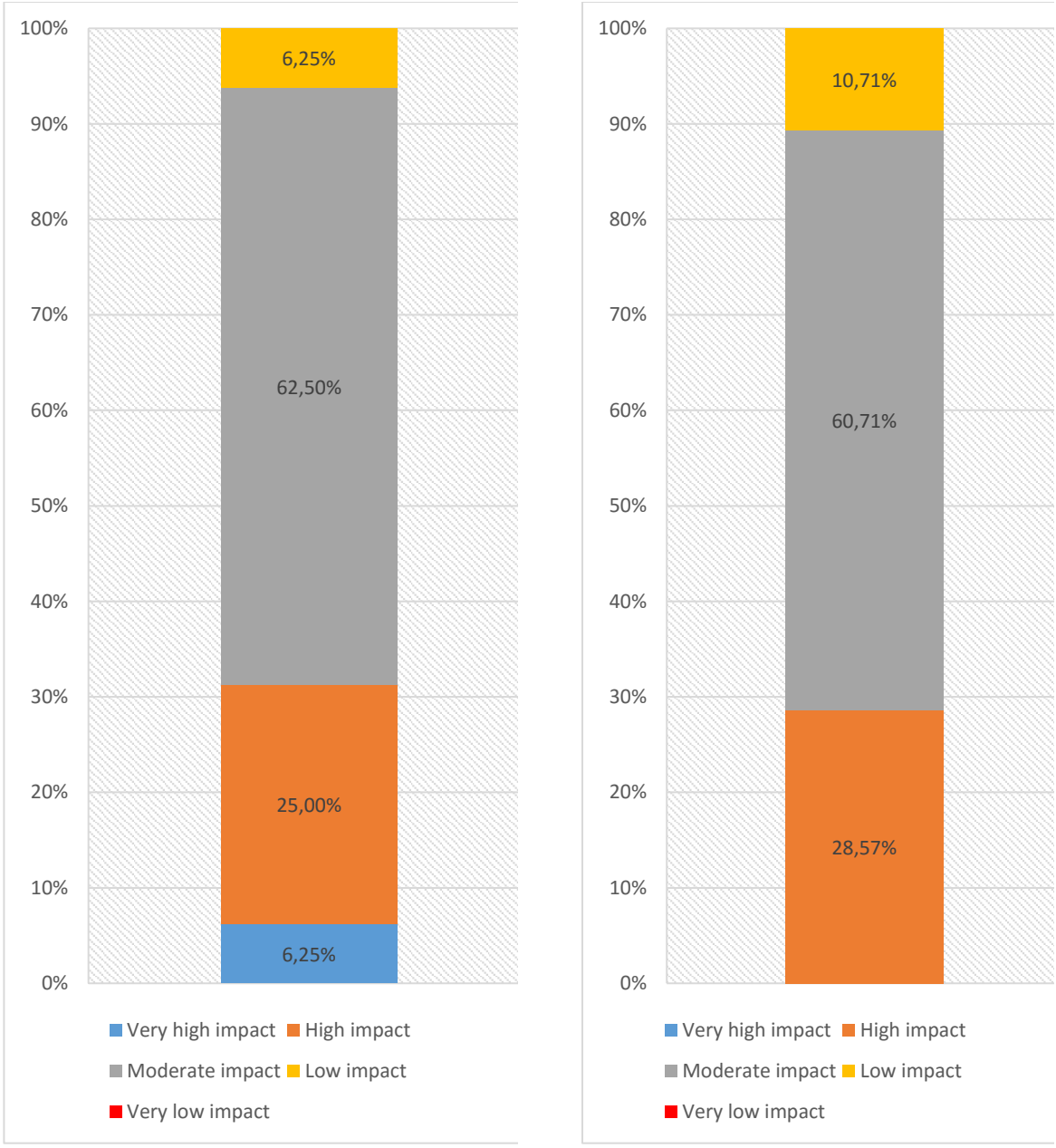


Chart 10. Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.3.6 What effect did the introduction of active TSA / D / R areas have on your workload?



Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.3.7 What effect did the air traffic intensity have on your workload?

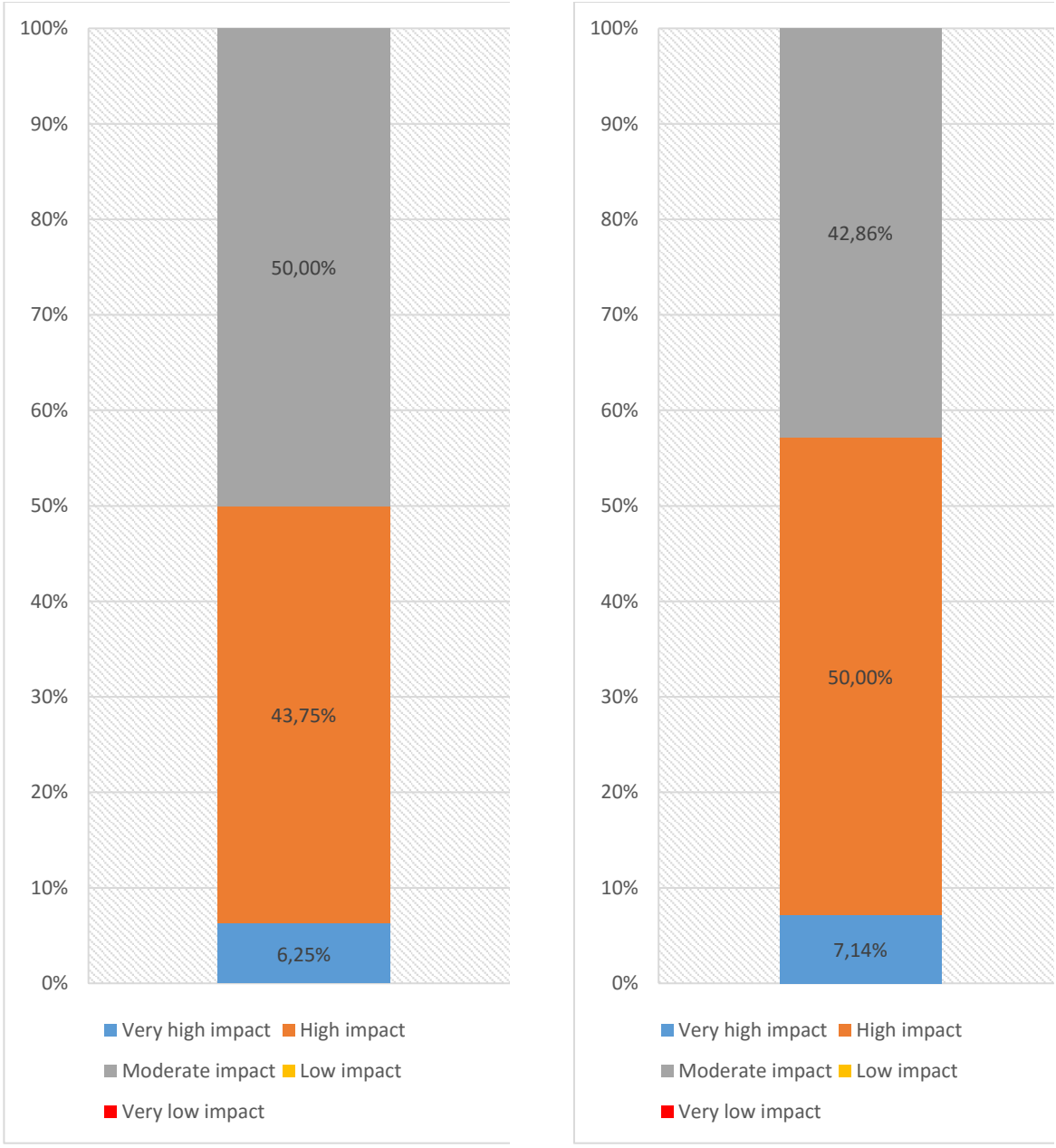
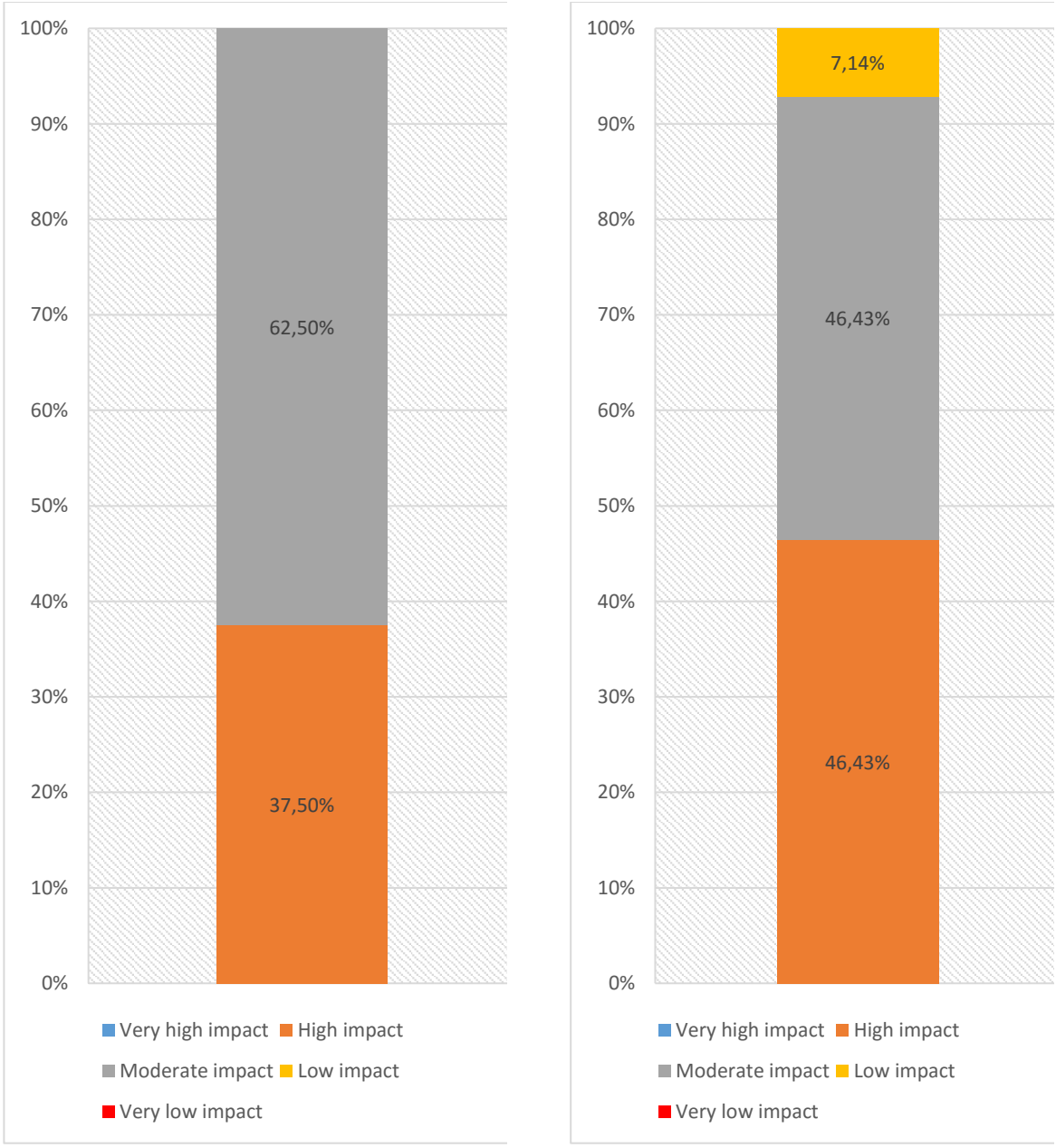


Chart 12. Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.3.8 What effect the complexity of the traffic had on your workload?



Data from 20-22.12.2017 simulation (left chart), data from the 03-04.01.2017 simulation (right chart).

3.3.9 **Was the traffic complexity in sectors acceptable?**

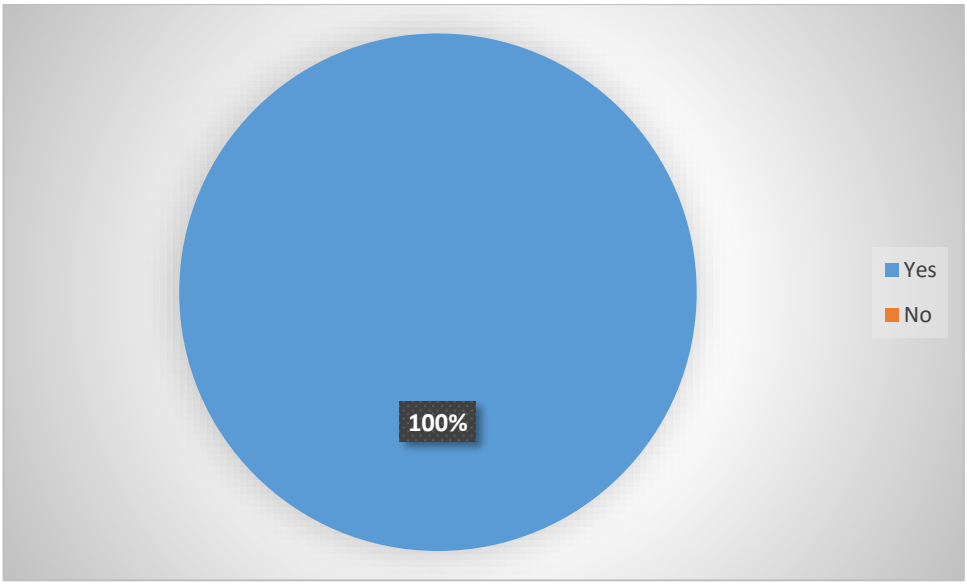


Chart 13. Data from 20-22.12.2017 and 03-04.01.2017 simulations.

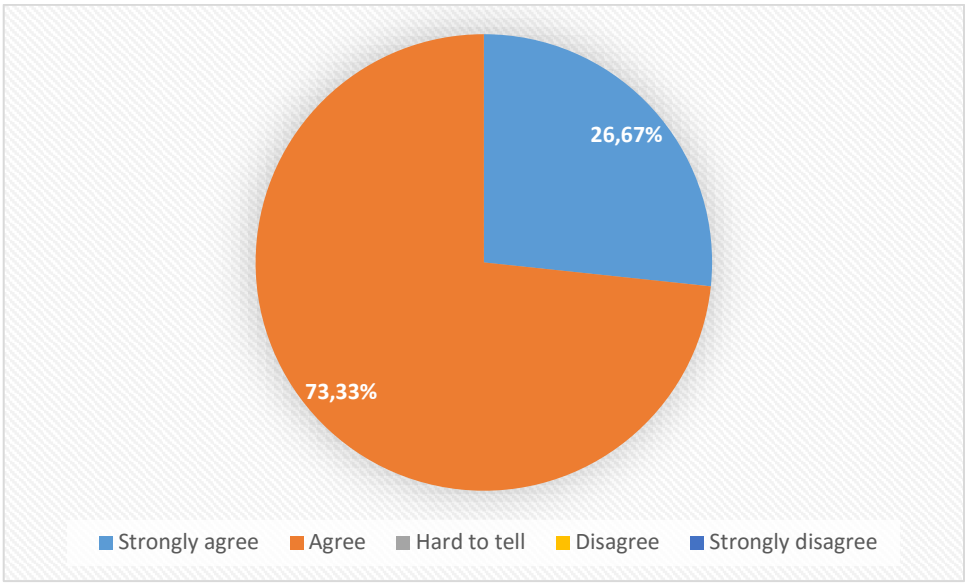
FRA environment did not cause an unacceptable traffic complexity in the opinion of the respondents.

In the question "What effect did the introduction of the FRA environment have on your workload?" no one responded "very high impact" or "high impact". The "low impact" and "very low impact" responses dominated (in total 87.5% of the responses in the first phase and 85.72% in the second phase of the simulation).

Over 60% of respondents indicated that the introduction of TSA / D / R areas had a “moderate impact” on their workload. Traffic intensity was described as having a “high impact” in the case of 43.75% of the responses in the first phase and 50% in the second phase. The complexity of the traffic was assessed by the 37.5% of respondents as having a “very high impact” in the first phase and by 46.43% in the second phase. Rise in esponses may be associated with an increase in traffic load in subsequent exercises.

3.4 DESCENT / CLIMB OF AIRCRAFTS

3.4.1 Did the routes of the aircrafts enable them to properly descend / climb to / from aerodromes?



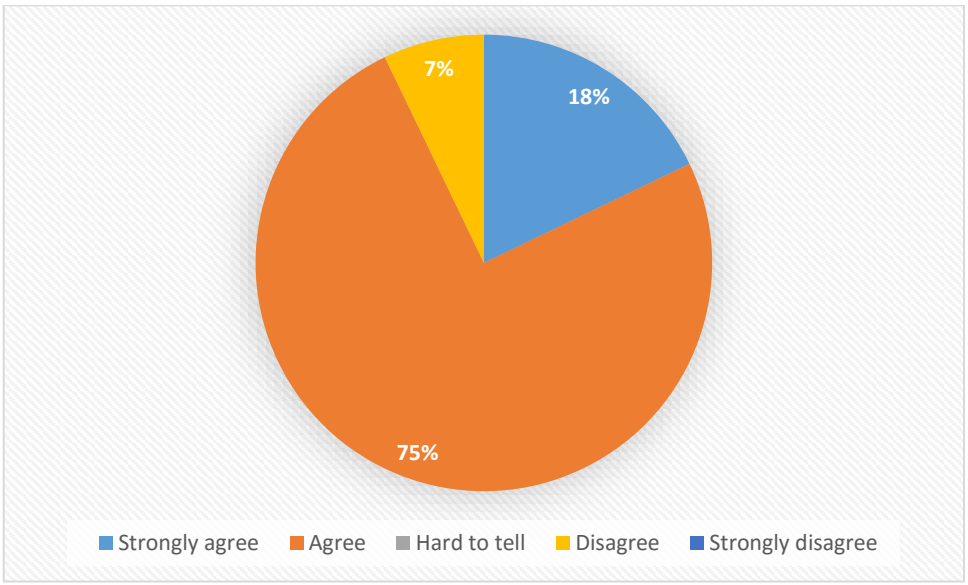


*Chart 14. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).*The answer disagree" is related to departures from EDDB where one of the channels systems did not provide full separation in the case of climb / descent.

3.4.2 What percentage of arrivals to aerodromes received, in your opinion, the optimal descent profile?

Average percentage share of arrivals to aerodromes with an optimal descent profile (mean value from questionnaires - simulations 20-22.12.2017): **88%**

Average percentage of arrivals to aerodromes with optimal climb profile (mean value from questionnaires - simulations 03-04.01.2018): **88%**

3.4.3 What percentage of departures from aerodromes received in your opinion the optimal climb profile?

Average percentage share of departures from aerodromes with an optimal descent profile (mean value from questionnaires - simulations 20-22.12.2017): **87%**

Average percentage of departures from aerodromes with an optimal climb profile (mean value from surveys - simulations 03-04.01.2018): **88%**

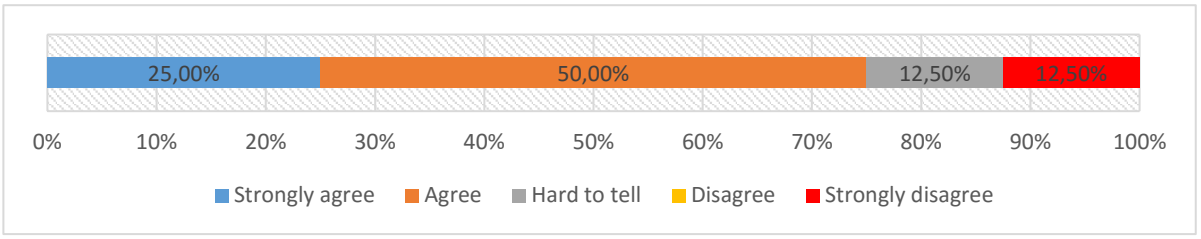
In the opinion of the respondents, a high percentage of optimal descent profiles was maintained. As factors influencing the limited possibility of an ideal descent profile, the most answers to the open-ended questions indicated factors that exist also in the airway environment: "In general, transverse traffic", "No planning", "Active TSA (sector FGNE)", "Departures / arrivals from / toEPWA via UVIVI-ABEROand RUDKA-POLON",”Flights to NEPOX point from the north and simultaneousdepartures from EPWA with active TSA 02 areas”,“Simulator conditions when pseudopilots do not ask for descent”,“Sectoral configuriation, the need to descend some aircrafts before TOD to ensure that it won’t continue flight into the next upper. Restrictions at the sector boundaries. LoA (Letter of Agreement).","Traffic situation and active areas. "," No separation in airways GOVEN-DIMEX and ARSAP-KULUV. "," Vertical division (borders of 4 sectors at once). ", "Lack of proper coordination with the LOW / HIGH sector or feeder.", "Transverse and opposite traffic.”

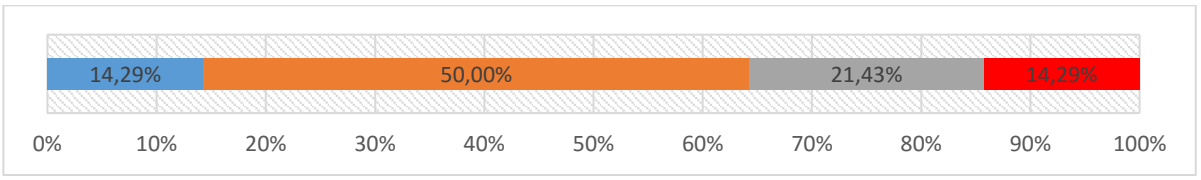
What is important, the FRA environment was not indicated as an obstscleto optimally descend / climb an aircraft.

3.5 CHANNELLING OF THE DEPARTURES / ARRIVALS FROM / TO AERODROMES NEIGBOURING WITH FIR EPWW

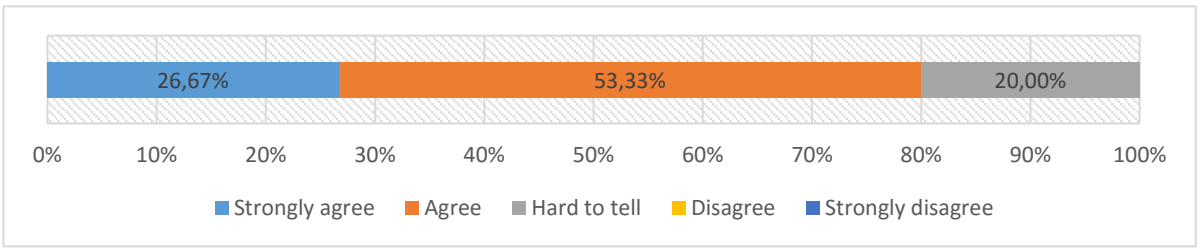
3.5.1 Is the channelling of the departures / arrivals from / to the aerodromes mentioned below sufficient to ensure proper air traffic control?

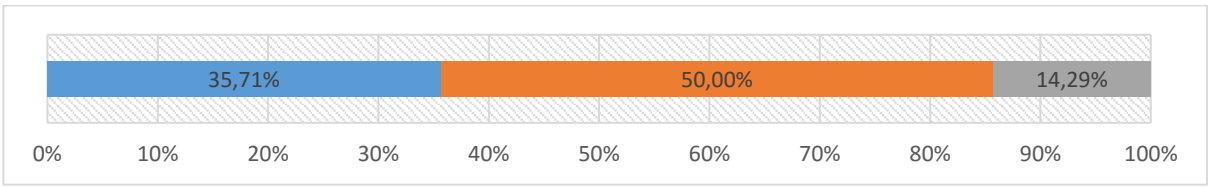
EDDB/EDDT



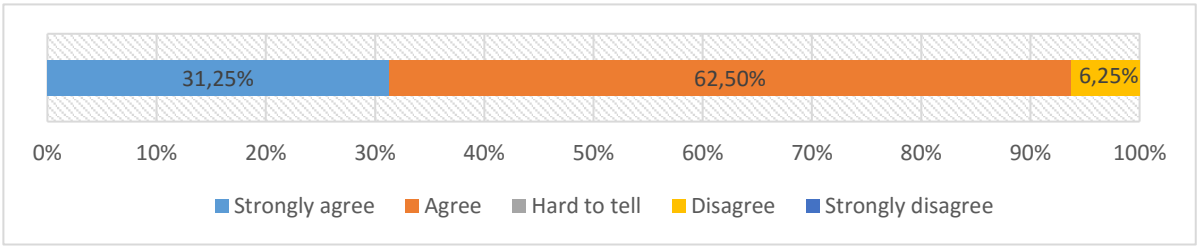


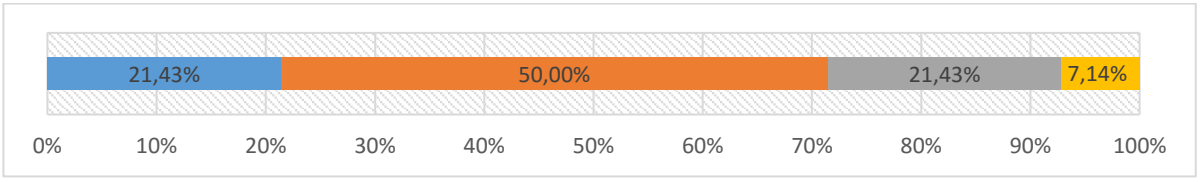
EYKA/EYVI





LKKB/LKPR/LKVO





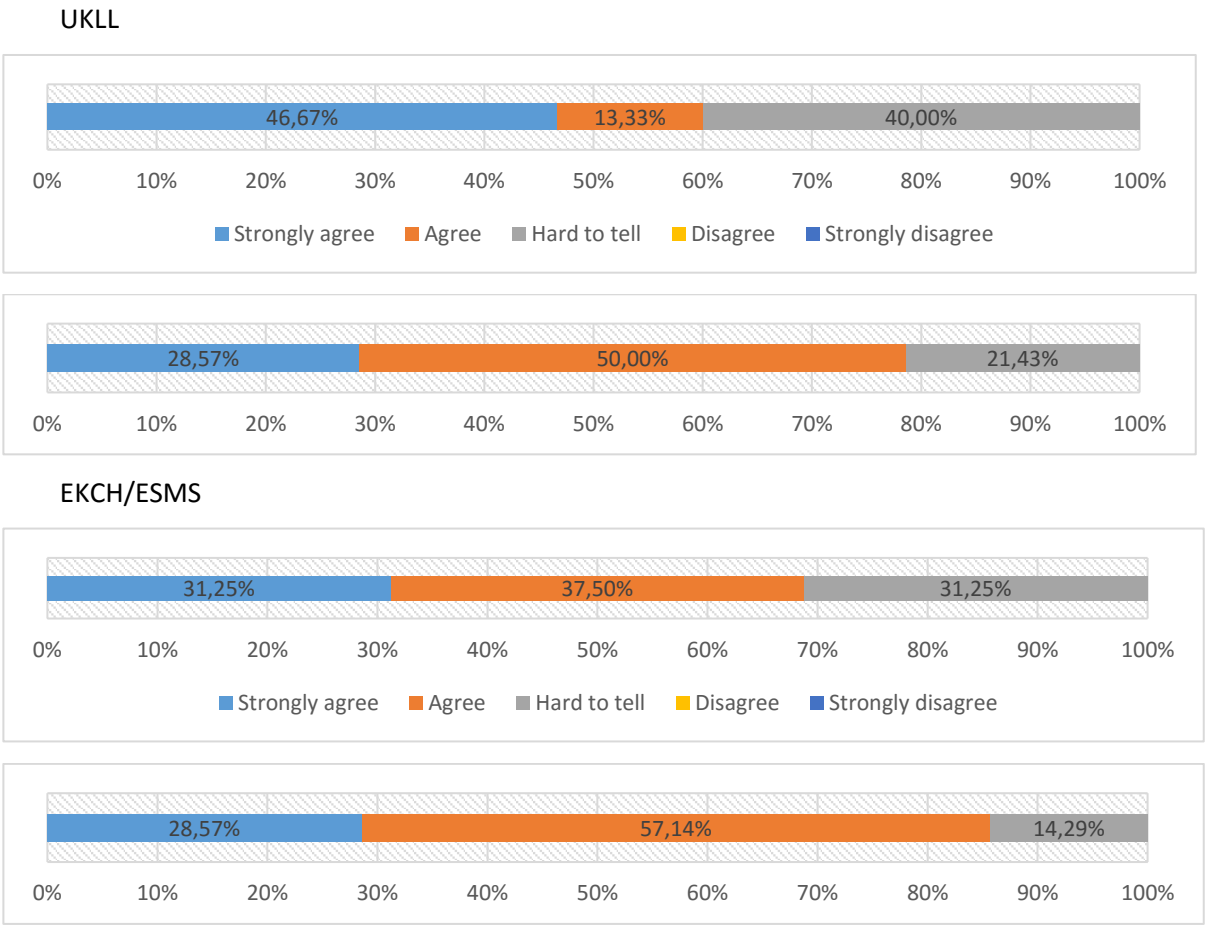


Chart 15. For each subgroup of aerodromes: data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart)

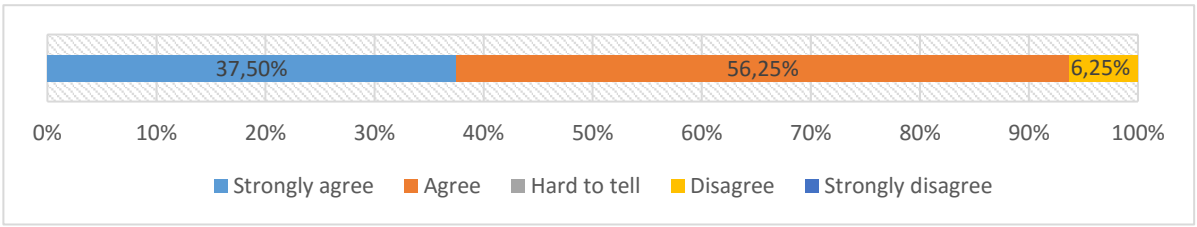
Negative responses appeared in the case of EDDB / EDDT and LKPR / LKVO / LKKB aerodromes and were related to the lack of the separation in the flight plans between transit and arrivals / departures. In the case of EDDB / EDDT, it was the departures via ARSAP to KULUV and flights from DIMEX to GOVEN. In the case of LKPR / LKVO / LKKB, it was the transit traffic from the LAGAR point (northbound, including destinations via RUDKA point) with the TOMTI arrivals.

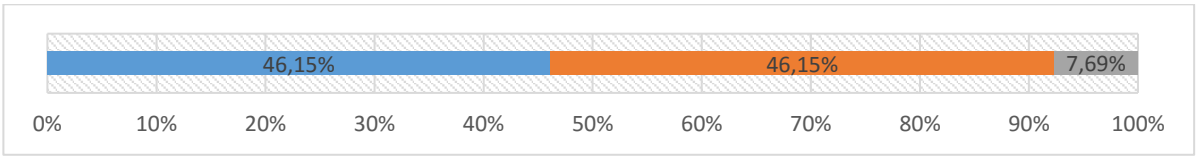
The "Hard to tell" answers appeared in relation to various sector configurations, rotation on simulation's workstations and the possibility that there were no adequate number of arrivals/ departures to / from given aerodromes necessary for assessment by a given respondent.

3.6 CHANNELLING OF THE DEPARTURES/ARRIVALS FROM / TO AERODROMES WITHIN FIR EPWW

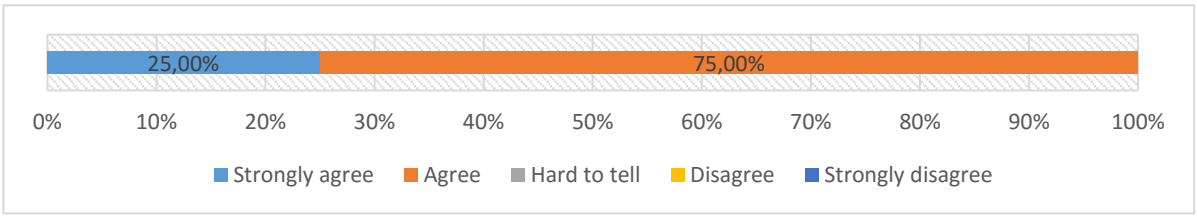
3.6.1 Is the channelling of the departures/arrivals from / to the aerodromes mentioned below sufficient to ensure proper air traffic control?

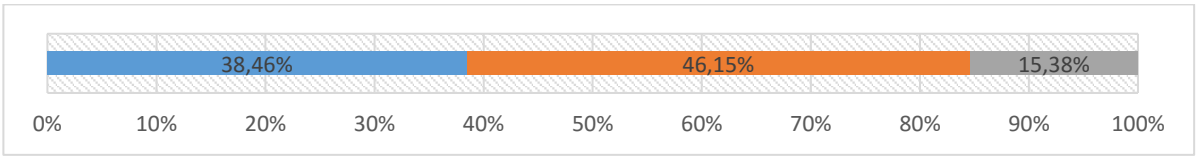
EPWA/EPMO



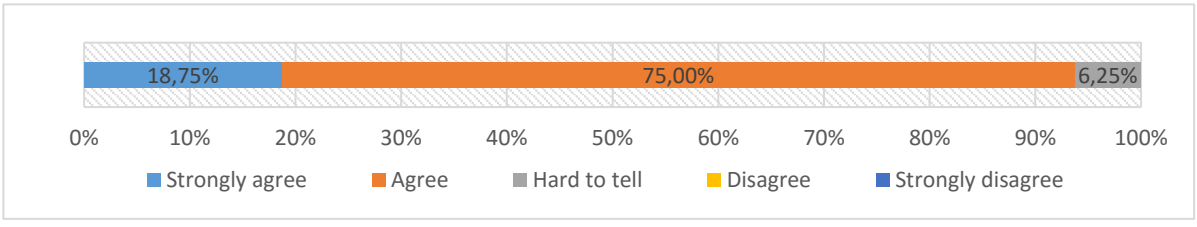


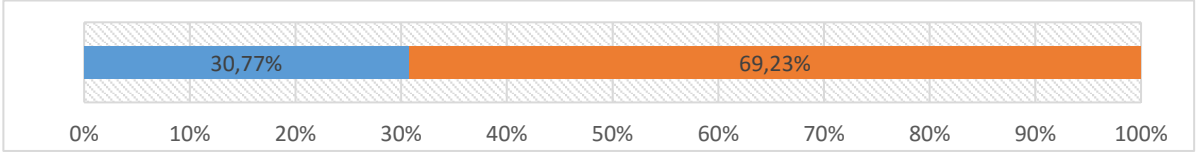
EPGD





EPKK/EPKT





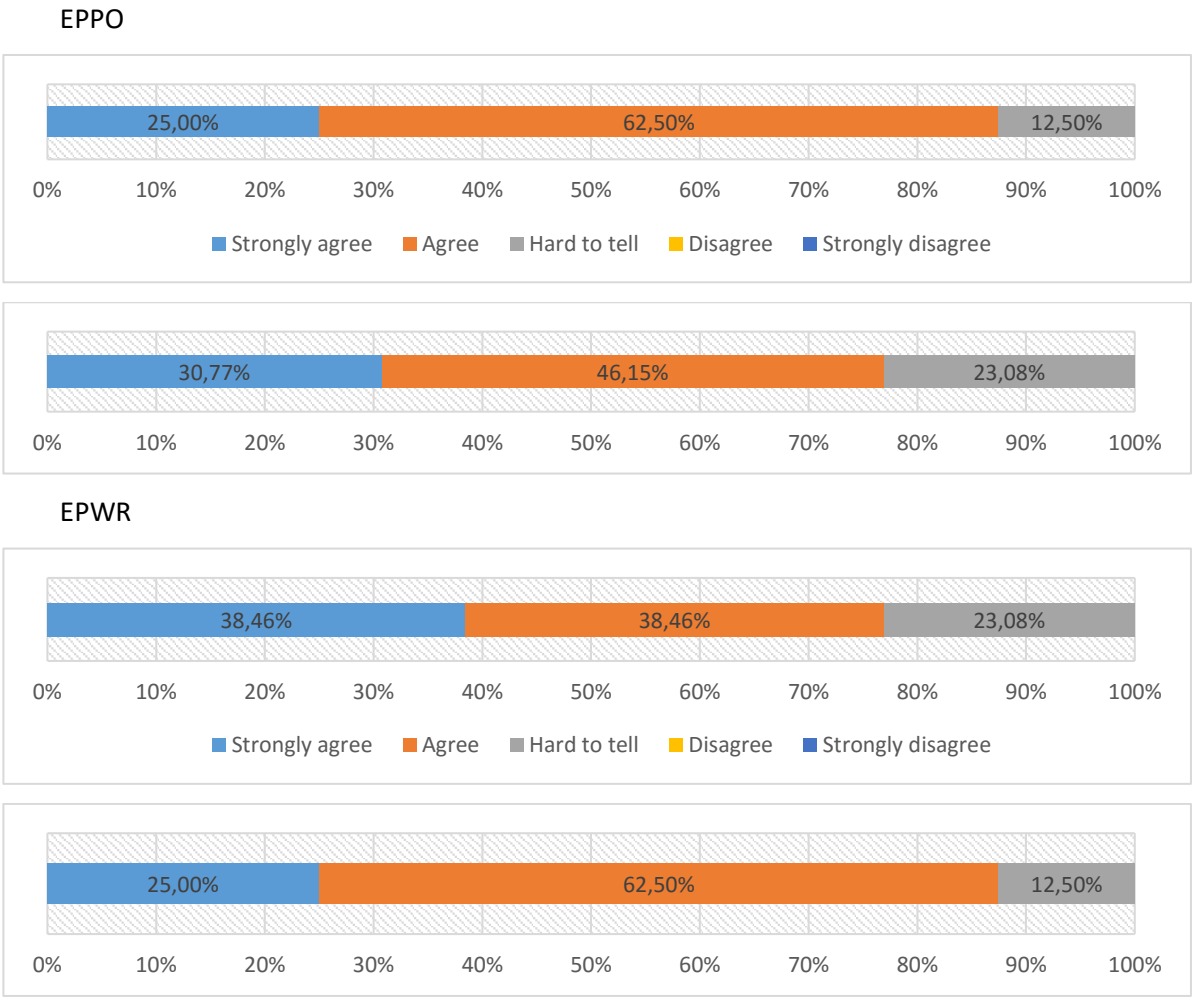


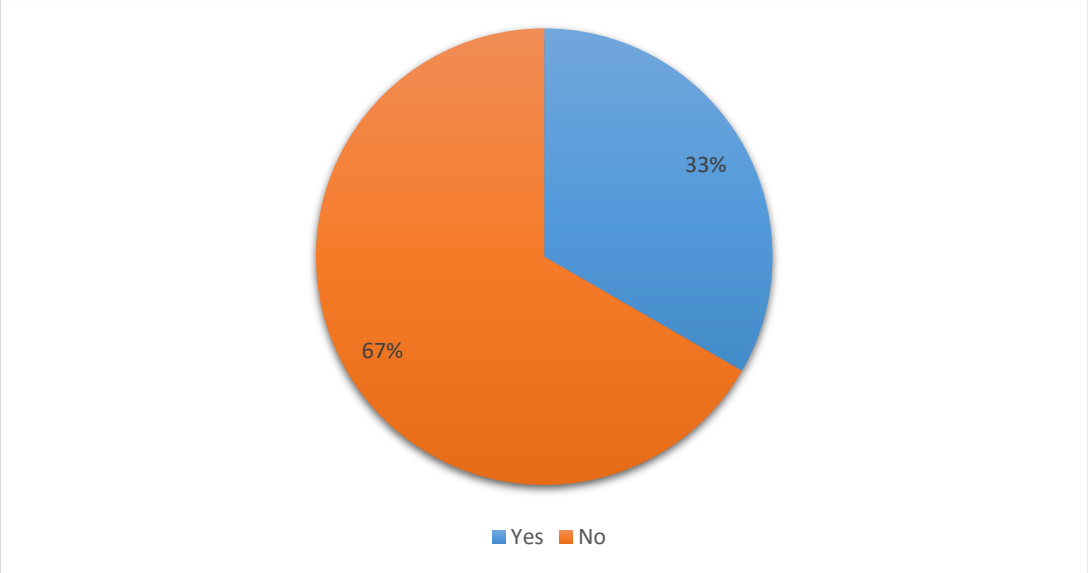
Chart 16. For each subgroup of aerodromes: data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart)

In the case of departures / arrivals from / to EPWA / EPMO, the "Disagree" answers were related to the flight plans of a/c departing from EPWA via the BULEP point and the possibility of not surpassing the TSA02 area by turboprop aircrafts (including DASH-8). In the second phase of the simulation, correct RAD restrictions have been introduced to channel these departures. Afterwards no negative responses have been reported.

The "Hard to tell" answers appeared in relation to various sector configurations, rotation on simulation's workstations and the possibility that there were no adequate number of arrivals/ departures to / from given aerodromes necessary for assessment by a given respondent.

3.7 CHANNELLING AIR TRAFFIC IN FIR EPWW

3.7.1 Do you think it is necessary to introduce an additional channelling of the traffic?



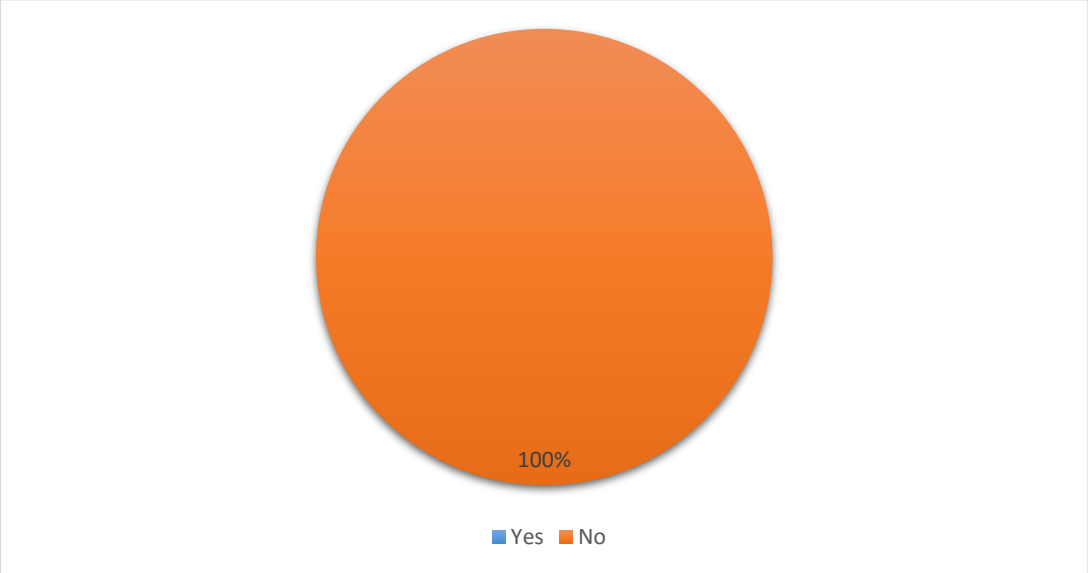


Chart 17. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

The described cases of the necessary channelling selected in the open answers are included in Appendix 1 to this document.

3.8 COORDINATION

3.8.1 Were the coordination and traffic at the borders between the ACC sectors in FIR EPWW predictable?

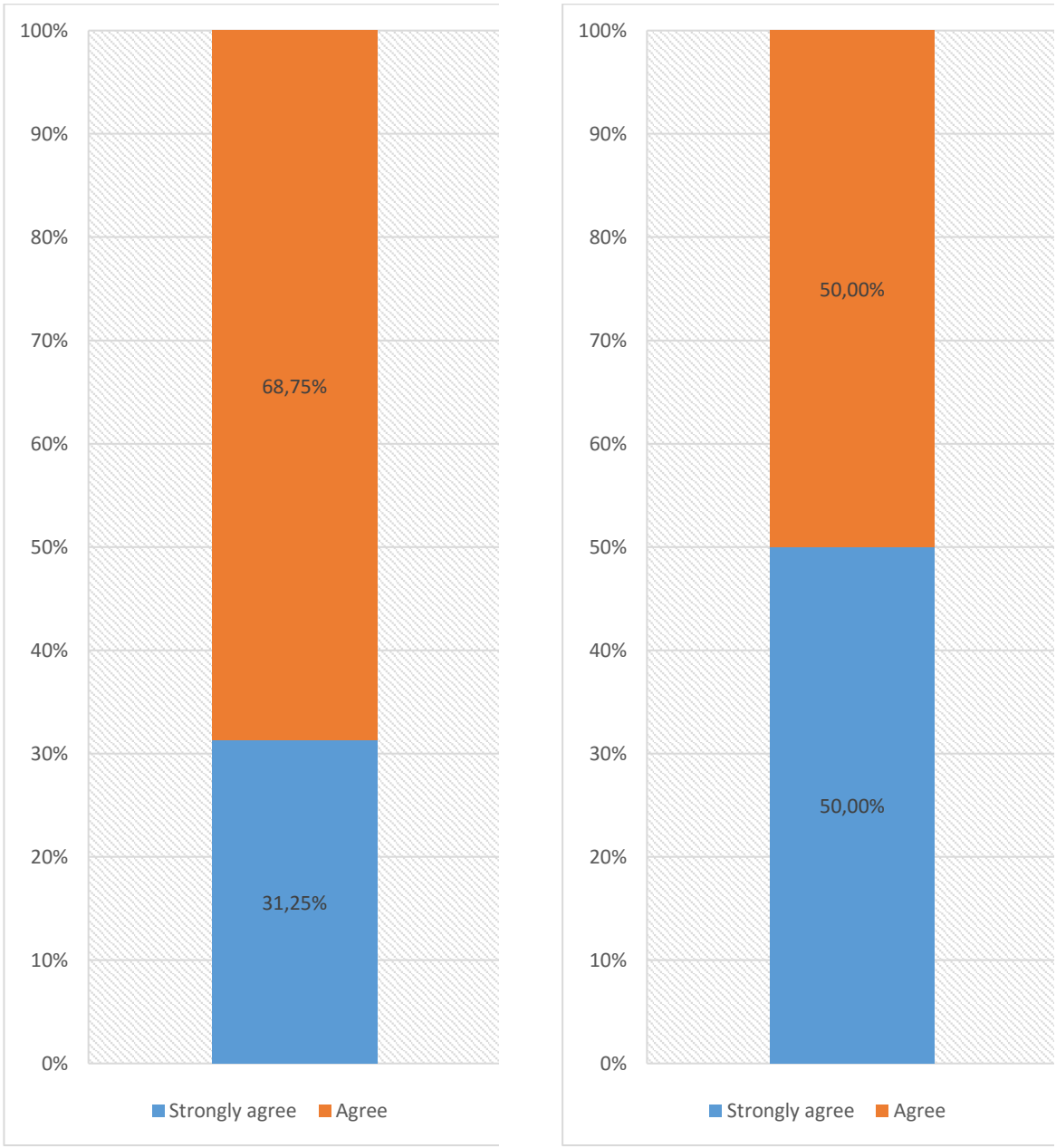


Chart 18. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

Coordination and movement at the borders in the sectors in the opinion of the simulation participants were predictable ("Strongly agree" and "Agree" responses). There was only one additional remark: "In simulated conditions, where voice communication was difficult, electronic coordination worked perfectly.”

3.8.2 Did you notice changes in the load for different transition levels during the exercises?

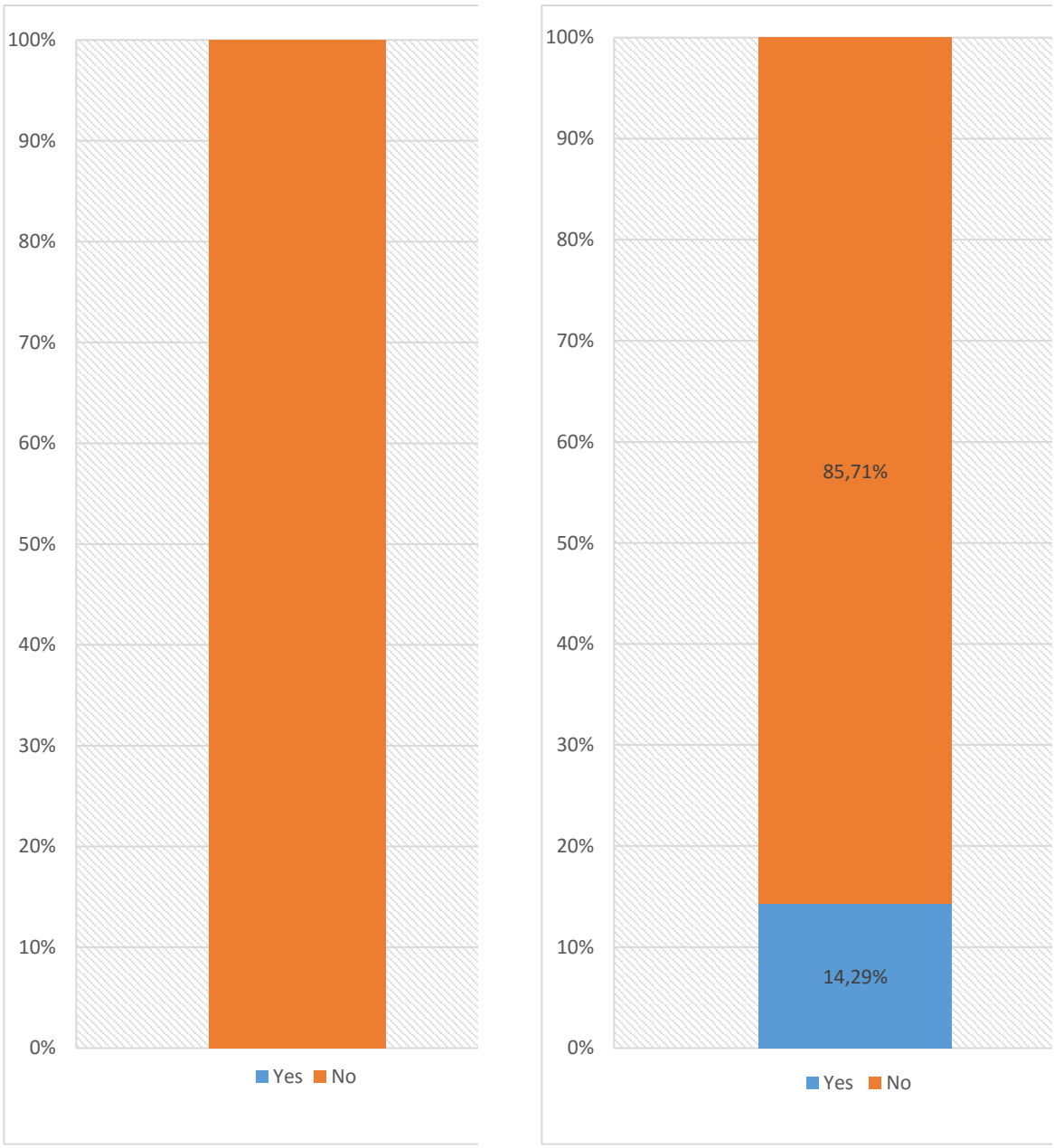
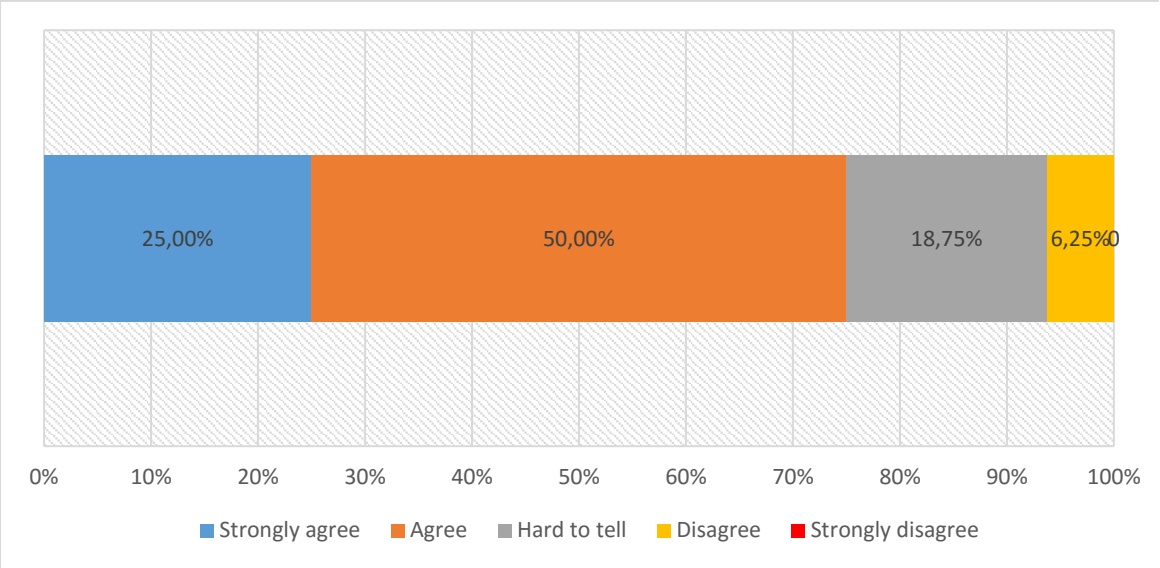


Chart 19. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

Most of the controllers participating in the simulation did not notice a difference in the workload between the lower FRA boundary set at FL95 and at FL305. One of the respondents stated that "FRA from the level of 305+ does not make much sense, because FRA from 95+ looks the same and is more logical and comfortable.”

3.9 FREE ROUTE AIRSPACE

3.9.1 Do you think that the FRA environment has shortened the route of aircrafts in the exercises compared to your experience in working in an ATS route network environment?



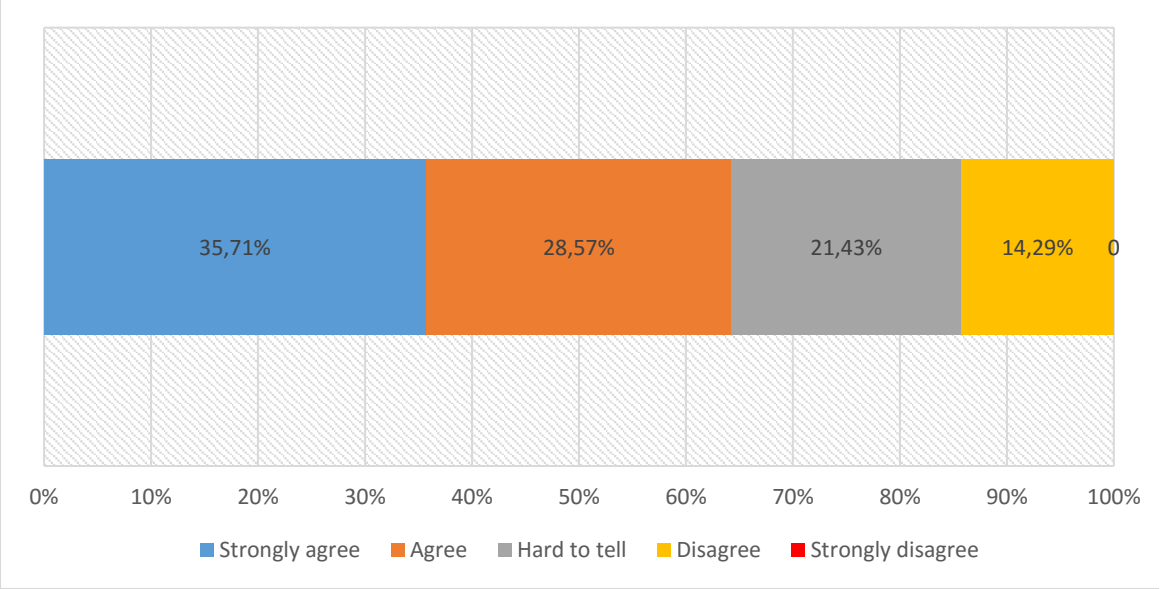


Chart 20. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

3.9.2 Do you think that the introduction of FRA will change the work of ATCOs in FIR EPWW?

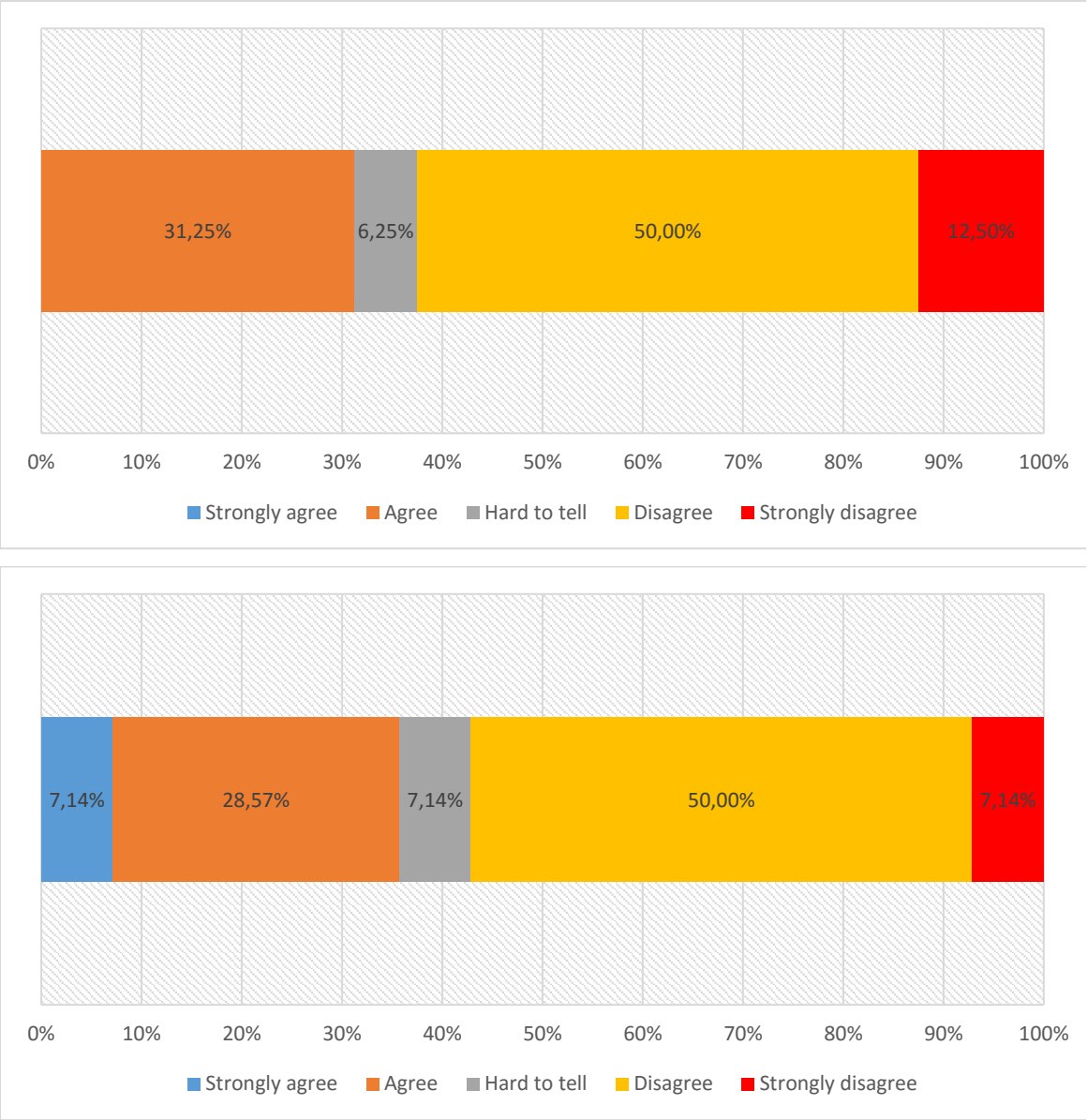


Chart 21. Data from 20-22.12.2017 simulation (top chart), data from the 03-04.01.2017 simulation (bottom chart).

Over 70% (answers "Agree" and "Strongly agree") of respondents stated that FRA environment will shorten the routes of aircraft, and more than 57% confirmed that the introduction of FRA will not change the work of the ATCOs in FIR EPWW ("Disagree" and "Strongly disagree").

On the issue of shortening routes, simulation participants, in an open question, indicated that the FRA environment is similar to working with tactical directs, but it will shorten routes and increase predictability for controllers who guide aircrafts according to routes stated in the flight plans: *„DCT flights will no longer be solely in the responsibility of the ATCOs, but will be made in accordance with the submitted FPL. Thanks to that, the aircrafts would not have to fly through ATS routes when the ATCO*

forgets to shorten their route, as it sometimes happens.", "The traffic is more predictable.", "The vast majority of aircrafts are currently flying to exit points while omitting active areas." "The current work technique of many active ATCOs is very similar to work in the FRA concept, so the changes are actually small.", "We fly DCT all the time. "," Airplanes fly DCT when possible in an ATS route environment. "," As it comes to concept of flights entering via one gate and leaving with another - we have been working this way in live traffic for years. "," Not all ATCO's issue DCTs. Now (in FRA), routes are optimized .".

In the open-ended question "How will the work of the ACC controller in FRA environment change", attention was paid to the increased predictability of traffic, reduced number of radio-transmissions and coordination of the DCTs: "Practically not at all.", "Everyone will work more alike. Airplanes are already flying DCTs. "," It will reduce the number of transmissions and shorten them. The work will be more predictable, without unnecessary DCT coordination. "," There should be less transmission (clearances to fly DCT would be less necessary). Planned flight-routes should be more predictable. "," Less talk. "," Reduction in the number of transmissions and their shortening. A more clear work, without unnecessary DCT coordination. "," 1. Fewer points on the route, more transparency! Super. 2. Points needed to bypass areas and to channel flows (arrivals/ departures , intermediate) - work perfectly. 3. Less necessary transmissions. Positive change. "," Ideologically: No, Loads: Yes (decrease), Predictability: Yes (increase). "," No need to issue a DCT at the first contact. Aircraft routes will be more predictable. "," Less talk definitely. Very good. "," Planned flight-routes should be more predictable and repeatable*.".*

3.9.3 **Do you think that working in an FRA environment from FL 305 is significantly different from working in an FRA environment from the FL95 level?**

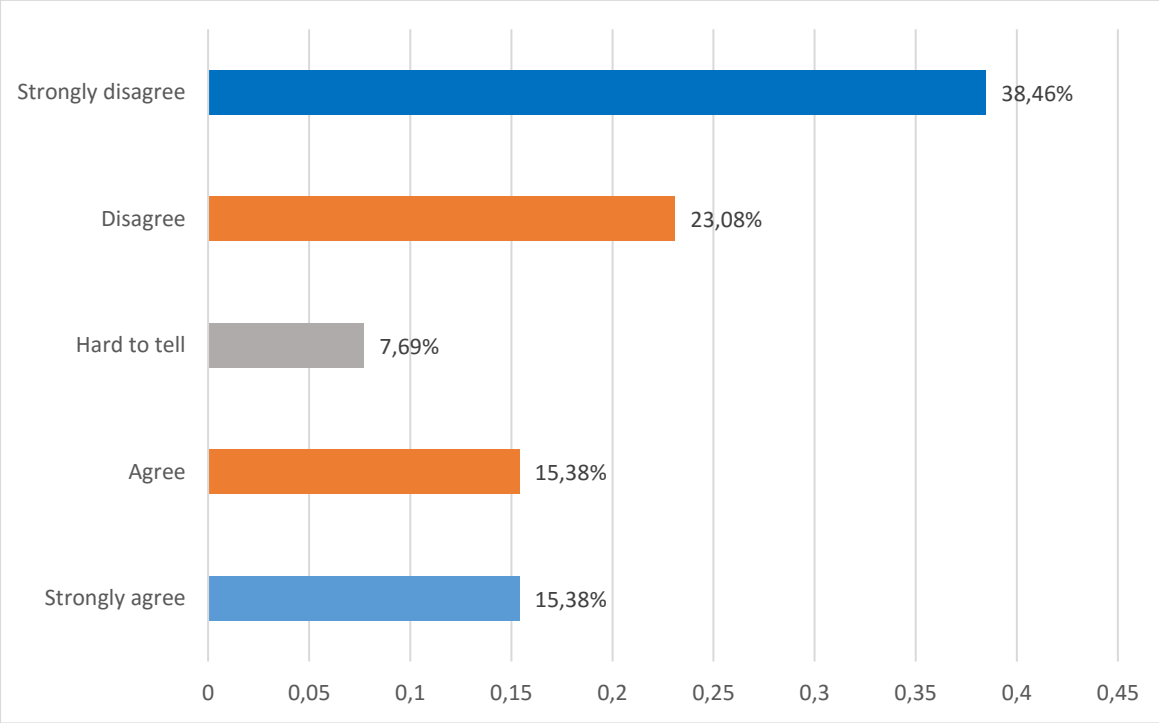


Chart 22. Data from the simulation survey: 03-04.01.2017.

3.9.4 **Based on the simulation, I prefer the introduction of FRA from the level:**

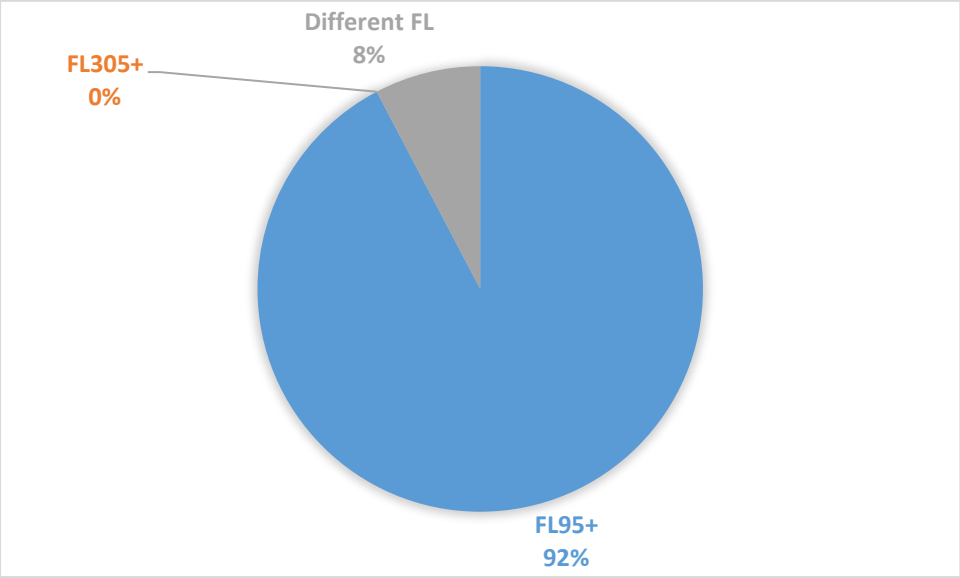


Chart 23. Data from the simulation survey: 03-04.01.2017.

As a different FL, the possibility of introducing FRA from GND (ground) was indicated. Nobody answered FL305+.

4 Summary

- The number of positive opinions about POLFRA dominated.
- The controllers had control over the air traffic in the exercises, they felt that they could plan and work as they wanted. They were able to predict the changing traffic situation and did not focus too much on any new problem or part of the sector. The workload, even in the conditions of an increased sectoral capacity, was acceptable in the FRA environment under simulation conditions.
- The FRA environment was indicated as the last factor affecting the increase in work load behind the traffic load, TSA / D / R areas activation, traffic complexity, vertical coordination and sequencing. The complexity of traffic in sectors was acceptable for ATCOs.
- Aircraft routes in the POLFRA environment enabled their proper descent and climb, in the opinion of persons participating in the simulation the optimal descent/climb profile was obtained for 87-88% of aircraft.
- In the opinion of the surveyed ATCOs traffic channelling to / from aerodromes was sufficient to ensure the proper conduct of air traffic control. The introduction of channelling improvements to the EDDB / EDDT and LKKB / LKPR / LKVO aerodromes will be essential for the model. In the opinion of the ATCOs after amendments resulting from the first phase of exercises, , there is no need to introduce additional channeling of traffic for transit traffic and arrivals/ departures from the EPWA aerodrome.
- There were no problems with coordination and movement at the sector boundaries. Traffic at the sector boundaries was predictable.
- Most of the controllers taking part in the simulation did not notice a difference in the workload and work technique between the lower FRA boundary at FL95 and FL305.
- The ATCOs mostly see FRA's benefits for air operators. FRA's environment is similar to working with tactical shortcuts, however, it will shorten routes and increase predictability for controllers who lead aircraft according to routes from flight plans. In the opinion of the participating ATCOsthe FRA environment will result in increase of traffic predictability , reduction of radio-transmissions and coordinations of DCT.
- **Based on the simulation, most of the surveyed controllers chose the introduction of POLFRA from the FL95 . One person chose the introduction of POLFRA from GND (ground). Nobody has indicated the introduction of POLFRA from FL305.**
- During RTS, on the basis of completed surveys and the comments collected during the simulation, it was possible to define several additional hot spots, places where it may be necessary to introduce additional RAD restrictions or other types of regulations. All these proposals will be analysed together with the POLFRA working team.