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Analysis of most constraining en route ATFM regulations, attributed to ATC capacity, during 2017

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Background

This report has been commissioned by the Performance Review Commission (PRC).

The PRC was established in 1998 by the Permanent Commission of EUROCONTROL, in accordance with the ECAC Institutional Strategy (1997). One objective of this strategy is "*to introduce a strong, transparent and independent performance review and target setting system to facilitate more effective management of the European ATM system, encourage mutual accountability for system performance…*"

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Analysis of most constraining en route ATFM regulations,
attributed to ATC capacity, during 2017

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SUMMARY

This study reviews capacity performance using new analysis methods to provide pragmatic information to ANSPs and the ATM community. The report contains a review of 2017 ATC capacity provision, beginning with the current bottlenecks, and includes individual reports on the effectiveness of specific ANSPs to improve capacity for the network. The results were sent to the relevant ANSPs and included questions from the PRC about current and future capacity provision. The ANSPs were invited to indicate how they propose to resolve or mitigate the bottlenecks in ATC capacity provision by replying to the PRC. The PRC has included the responses from the relevant ANSPs in the publication of this report as appropriate.

This study is in line with the jointly agreed EUROCONTROL/EC paper on the complementarity of PRC tasks with those of the PRB, in order to avoid duplication.

Keywords

Capacity bottlenecks, performance review, staffing issues , military operations and training,

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1 Introduction

In previous Performance Review Reports the PRC looked at the 'most penalising ACCs' over the preceding twelve month period and tried to identify the main constraints to capacity performance in each ACC. In the analysis of 2017, the PRC has decided to take a different approach.

The PRC has decided to focus on the individual ATFM regulations caused by capacity bottlenecks, resulting in delays to airspace users. Specifically, in this analysis, the PRC has decided to concentrate on the en-route ATFM delays attributed to ATC capacity.

To most people, a regulation attributed to ATC capacity would be expected when the traffic demand is higher than the declared capacity of the ATC sector. (The declared capacity can be considered as a safety brake to prevent the relevant ATCO from becoming overloaded.) It is frequently assumed (but not always correct) that increasing the declared capacity of a sector would require some form of investment by the ANSP, or the NSA, be it in providing additional, or more proficient, ATCOs; better equipage or changes in airspace structures.

The PRC has conducted several analyses on capacity bottlenecks, beginning with the most penalising individual en-route ATFM regulation which, in the opinion of the FMP requesting the regulation, should be attributed to ATC capacity.

1.1 Capacity Bottlenecks: Most penalising ATFM regulations attributed to ATC capacity

The table below shows the most penalising individual ATC capacity attributed en-route ATFM regulations in 2017.

Date	ANSP entity (ACC or sub-ACC)	Total delay for single regulation (minutes)	Geographical location – specific sector configuration	Total Capacity attributed delay at same specific sector configuration 2017
22/06/2017	MUAC Brussels sectors	8754	Brussels East High FL335+	69,339
16/07/2017	Nicosia ACC	7369	NICOSIA E1 + E2 GND-UNL	90,872
25/02/2017	Canarias ACC	6997	Norte Este sector	43,656
22/06/2017	MUAC DECO sectors	6492	Delta West Low sector FL245-FL355	62,930
30/09/2017	Marseille ACC	5224	LFMST + LFMBT + LFMAJ + LFMMN	54,870
22/07/2017	Marseille ACC	5202	LFMST + LFMBT + LFMAJ + LFMMN	54,870
11/02/2017	Paris ACC	5144	PARIS PU + TU+ HP + UT + UP	11,420
25/03/2017	Canarias ACC	4814	Norte Este sector	43,656
22/06/2017	MUAC DECO sectors	4781	Delta West High FL355+	65,775
12/08/2017	Karlsruhe UAC	4457	Soellingen 245-355	44,470
09/04/2017	Nicosia ACC	4406	NICOSIA S1 GND-UNL	55,926
01/07/2017	MUAC Brussels sectors	4355	BRUS OLNO FL245-999	151,589

Table 1: Twelve most penalising ATFM regulations attributed to ATC capacity in 2017

The PRC is aware that several of the ANSPs monitor capacity throughput based on sector occupancy rather than strictly according to sector entries. The PRC is also aware that ANSPs and the Network Manager also apply Short Term ATFCM measures (STAM) to particular flights to avoid imposing regulations. The PRC notes that both these approaches can provide higher hourly throughput of traffic - whilst ensuring safety – than using the sector entries approach. However, when the expected demand exceeds the available capacity (based on occupancy) the ANSP reverts to the normal capacity regulation process as implemented by the Network Manager and requests regulations based on sector entries. Therefore the analysis of regulations based on sector entries is also valid for those ANSPs that use sector occupancy.

The analysis considered historical capacity and traffic data from NEST and ATFM source data from Network Manager, as used in other PRU reports. Although the analysis was performed without the involvement of the relevant ANSPs, the ANSPs were provided with advance copies of the finding and asked for feedback which would be published as part of the final report.

1.2 Methodology of Analysis

The PRC considered the sector infrastructure for each of the geographical locations associated with the ATFM regulations. This includes physical characteristics such as vertical or lateral limits; possibility for collapse / de-collapse including respective declared capacity; historic delays for the same locations.

Civil Military airspace structures were considered and whether or not they were reserved or allocated for military operations and training on the day of operations. The notified meteorological conditions were reviewed, both forecasted and actual in the relevant airspace and surrounding areas.

The PRC reviewed the evolution of the capacity constraints and ATFM regulations on the day of operations, with special regard to regulated capacity levels and other relevant ATFM regulations e.g. re-routing scenarios in place.

Finally, where relevant, the PRC reviewed the historic evolution of declared capacity for each sector using ATFM regulations from previous years.

1.3 Common findings: (previous relevant PRC recommendations)

Attribution of external capacity constraint is incorrect: The influence of adverse weather and or military operations and training is not reflected in the reason for regulation.

(Recommendations in PRR2015 and PRR2013 requested States “to accurately identify specific capacity constraints that adversely impact the service provided to airspace users” & “ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated”)

ANSPs are imposing internal capacity constraints: ANSPs are regulating traffic at capacity levels below the published declared capacity (without providing an explanation); are safely handling traffic for sustained periods at levels above published declared capacity, or are publishing declared capacity levels, and regulating traffic, at levels lower than historic figures for the same

sector configuration. Each of these cases highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

(Recommendation in PRR2015 requested member states "…to review sector capacities, both with and without airspace restrictions, to increase network performance.")

ANSPs are operating collapsed sectors during periods of high demand instead of providing all available capacity to airspace users. This goes against the ICAO expectation that ANSP will provide sufficient capacity to handle traffic during peak demand periods. The operation of a reduced level of capacity, by operating collapsed sectors, is an internal issue that can and should be remedied by the ANSP.

(Recommendations in PRR2015 & PRR2014 requested States "…to provide capacity to meet demand instead of regulating demand to meet reduced capacity" & "to ensure that capacity is made available during peak demand.")

ANSPs are failing to address historic and recurrent lack of capacity. Capacity bottlenecks, even those that have been bottlenecks for a considerable period of time, are not being mitigated or resolved through the addition of extra capacity. Some ANSPs report that their ability to act on this unilaterally is impeded by binding economic regulation; others report that structural changes are required to the airspace which requires the multi-lateral cooperation of other parties such as military and NSA, and not only within their own state.

(Recommendations from PRR2014, PRR2012 & PRR2011, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth.")

2 Case studies

2.1 Maastricht UAC Brussels Sectors: Brussels East High

8754 minutes of delay attributed to ATC capacity on Thursday 22/06/2017 from 11:40 to 20:00.

Year	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	68,526	132,945
2016	69,055	148,536
2015	48,770	100,650
2014	55,009	77,391

Table 2: Annual ATFM delays attributed to Brussels East High sector

Sector infrastructure and capacities: The Brussels East High Sector is located primarily over Luxembourg and the east of Belgium. It is a collapsed sector comprising elements of the Brussels OLNO sector and the Brussels LUX sector. The vertical limits of the sector are from FL335 to unlimited.

The individual elements of the Brussels LUX and OLNO sectors, above FL335, can be opened in several different ways. Each separate configuration has its own respective declared capacity.

The various configurations are shown below with the respective declared capacity shown in brackets ().

Figure 1: MUAC Brussels East sector

It is interesting to note that the declared capacity of East High is 68 whereas opening two sectors instead can offer declared capacity of up to 104 (East Middle & East Upper) aircraft per hour through the same volume of airspace.

<table>
<tr><td rowspan="4">EAST HIGH (68)</td><td rowspan="4">F335+</td><td rowspan="2">OLNO HIGH (53)</td><td rowspan="2">FL335+</td><td>OLNO UPPER</td><td>FL375+</td><td rowspan="2">EAST UPPER (52)</td><td rowspan="2">FL375+</td></tr>
<tr><td>OLNO MIDDLE</td><td>FL375 FL335</td></tr>
<tr><td rowspan="2">LUX HIGH (56)</td><td rowspan="2">FL335+</td><td>LUX UPPER</td><td>FL375+</td><td rowspan="2">EAST MIDDLE (52)</td><td rowspan="2">FL375 FL335</td></tr>
<tr><td>LUX MIDDLE</td><td>FL375 FL335</td></tr>
</table>

Table 3: Options for declared capacity Brussels East High sector

Civil Military airspace structures: The Lux sector, and therefore the East High sector, also contains significant military training and operations areas TRA/TSA S1-S5 which extend from UNL to 4500ft (TRA/TSA S1-S5 are also known as TRA SB). The TSA/TRA NB complex also impacts the East High sector. The relevant areas are shown in blue, in contrast to the yellow line in the map, which roughly shows the lateral limits of the East High sector. Reservation or activation of these areas results in constraints to both available route options and the available capacity for general air traffic.

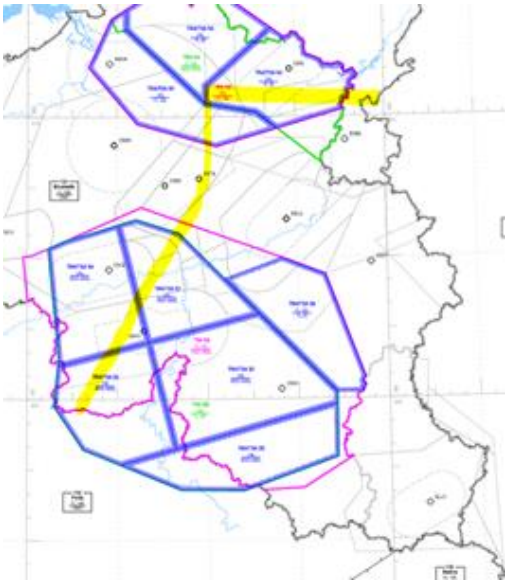


Figure 2: TRA/TSA S1-S5

In 2017 3992 minutes of en route ATFM delay were attributed to military operations and training taking place in the East High sector.

On 22nd June 2017 the airspace use plan for Belgium showed that TRA SB, was reserved from 09:00 until 15:30 and again from 15:30 until 16:00 (all times UTC). The vertical limits of the reservations were from FL999 to FL195.

The updated airspace use plan published at 13:30 reconfirmed the bookings for TRASB from 13:30 to 15:30 and from 15:30 to 16:00, again from FL999 to FL195.

Meteorological conditions on the day of operations: Adverse weather phenomena can impact available ATC capacity at airports and in en route situations. As part of the Daily EUROCONTROL Network Weather Assessment, the Network Manager had issued an en route weather alert forecast on 22nd June 2017.

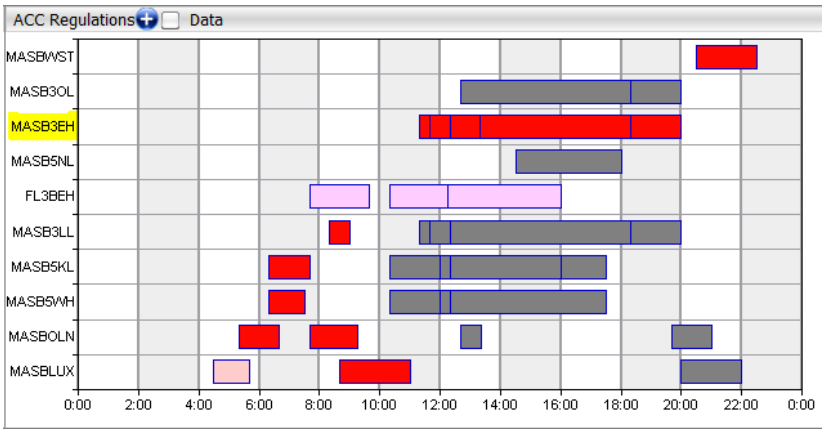
CONVECTION
10-20Z: OCNL SVR TS FL360-380 Benelux & E France, Denmark, Germany.
[From 10:00 – 20:00 UTC, occasional severe thunderstorms can be expected between FL360 and FL380 over the Benelux …]

Neighbouring Flow Management Positions (FMPs) to MUAC attributed significant delays to weather phenomena on 22nd June.

Name of FMP	Timing of Regulation	Impact of ATFM weather Regulation (min.)
Langen ACC FMP	12:40 to 23:59	6,766
Munich ACC FMP	13:00 to 21:00	3,856
Rhein UAC FMP	08:00 to 23:40	21,088
Bremen ACC FMP	12:20 to 03:40 on 23/06	6,241
Maastricht UAC FMP	07:40 to 01:00 on 23/06	33,344
London FMP	08:40 to 20:00	26,291
Amsterdam FMP	15:50 to 22:00	3,146
Reims ACC FMP	12:20 to 23:59	7,399
Total		108,131

Table 4: Weather related ATFM delays at neighbouring FMPs to MUAC on 22 June 2017

Evolution of Capacity constraints and ATFM regulations on Day of Operations for Brussels East High sector MASB3EH**:** It is evident that for the first 20 minutes of the regulation (11:20-11:40) and for the final 100 minutes (18:20-20:00) the regulated capacity was equal to the declared capacity of Brussels East High sector (68). However, from 11:40 to 18:20 the regulated capacity was significantly lower than the declared capacity – reducing by approx. 30% for five hours.



ACC Regulations Data

ID	YB3EH22	YB3EH22	YB3EH22	YB3EH22	YB3EH22
TV	MASB3EH	MASB3EH	MASB3EH	MASB3EH	MASB3EH
RefLoc	EDYYB3EH	EDYYB3EH	EDYYB3EH	EDYYB3EH	EDYYB3EH
StartsDayBefore	No	No	No	No	No
Open	11:20	11:40	12:20	13:20	18:20
Close	11:40	12:20	13:20	18:20	20:00
Capacity	68	61	54	49	68
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 3: Brussels High East Sector – regulations on 22nd June 2017

It is also noted that ATFM delays were allocated to MASBOLN and MASBLUX between 05:00 and 13:30 even though neither sector was opened at the time - East high and Olno Low & Lux Low were open instead.

Summary

- Traffic demand was above the regulated capacity in the Brussels East High sector.
- Traffic demand was, at times, above the normal available capacity in the Brussels East High sector.
- Adverse weather constrained the normal available capacity in the Brussels East High sector.
- Military activity and bookings constrained the available capacity in the Brussels East High sector.
- Operation of the collapsed Brussels East High sector constrained capacity that would have been available if either the East Upper & East Middle sectors were opened separately.

Conclusions

Traffic demand in that portion of Belgian airspace can be very high (+100) and at times exceeds the declared capacity of the ATC sectors. This indicates that, despite already handling very high throughput, MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users.

Capacity constraints resulting from military activity and adverse weather would explain the reduction in available capacity and the high delays but this is not transparent if delays are simply attributed to ATC capacity (if the causes of capacity constraints are not properly identified they

cannot be resolved). In the absence of sufficient capacity to meet the peak traffic demand, it is evident that the airspace needs to be effectively managed to provide the optimum benefit to all airspace users.

The Brussels High East sector (declared capacity 68) is itself a collapsed sector: MUAC was already constraining available capacity by not opening the constituent sectors separately, as East Upper & East Middle (potential capacity up to 104).

In the opinion of the PRC, the inability to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former, the capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

PRC Questions (See Section 3.1.1 for ANSP response)

A significant reduction in regulated capacity, up to 28%, is observed between 11:40 and 18:20, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. It is obvious that an additional factor (most likely, either military operations and training, or adverse weather) prevented the deployment of the full declared sector capacity, but unless it is identified it cannot be resolved or mitigated against in the future.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to "to accurately identify specific capacity constraints that adversely impact the service provided to airspace users" & "ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated"

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

The original capacity constraint in the Brussels sectors was due to the decision to open a collapsed sector East High instead of opening two separate sectors. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations requested States to "provide capacity to meet demand instead of regulating demand to meet reduced capacity" & "to ensure that capacity is made available during peak demand."

Q2: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

Traffic demand in that portion of Belgian airspace can be very high (+100), and at times exceeds the declared capacity of the ATC sectors (collapsed or individual). The PRC is aware that vertical restrictions are permanently applied on aircraft flying to or from certain airports to prevent them entering the airspace, meaning that the unconstrained demand would be significantly higher than what is recorded. With such high demand for capacity currently, and in light of the increasing levels of traffic it is evident that all options to increase capacity should be investigated

and implemented, including full use of civil military cooperation and coordination to ensure that the airspace is managed for the optimum benefit of the airspace users.

Previous PRC recommendations requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q3: What specific plans are in place to increase both current and future capacity in the Brussels East High sector, and or the Brussels Lux and Brussels Olno sectors?

➔ The corresponding responses provided by the ANSP can be found in Section 3.1.1.

2.2 Nicosia ACC: NICOSIA LCCCES0 GND – UNL

7369 minutes of delay attributed to ATC capacity on Sunday 16/07/2017 from 06:40 to 23:20.

ATFM delays attributed to LCCCES0 sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	90872	180069
2016	44126	83366
2015	101779	201397
2014	28486	44467

Table 5: Annual ATFM delays attributed to LCCCES0 sector

Sector infrastructure**:** The LCCCES0 sector is located in the east of the Nicosia FIR. It is a collapsed sector comprised of sector E1 (a.k.a. sector E) and sector E2. The vertical limits of the sector are from ground to unlimited.

Sectors E1 and E2 can be opened independently of each other (each has its own declared capacity) although sector E2 only appears to be opened as part of a collapsed sector, either with E1 or with S1 as LCCCSO1.

The declared capacity of sector LCCCES0 is 24 whereas opening the two individual sectors instead offers declared capacity of up to 51 aircraft per hour through the same volume of airspace.

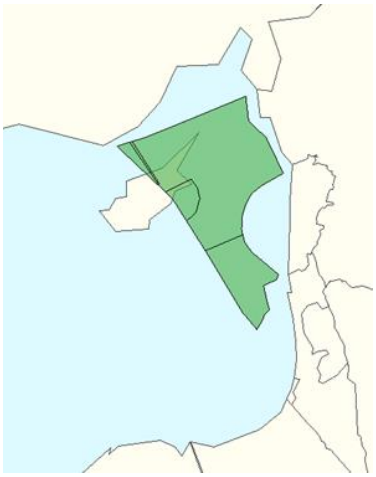


Figure 4: Nicosia LCCCES0 Sector

Declared capacity	2017	2016	2015	2014	2013	2012
LCCCES0 sector	24	24	21	21	27	27

Table 6: Historic declared capacity for LCCCES0 sector

The declared capacity in the LCCCES0 sector has changed in recent years. In 2012-2013 it was 27 aircraft per hour, reducing to 21 aircraft per hour for 2014-2015 and increasing slightly again to 24 aircraft per hour in 2016-2017. The reasons for the overall decrease in declared capacity are not known to the PRC.

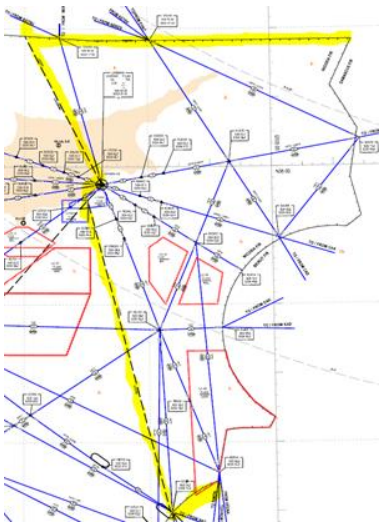


Figure 5: LCD44, LCD45 and LCD46

Civil Military airspace structures**:** Sector LCCCES0 contains three danger areas, LCD44, LCD45 (both from MSL to FL200) and LCD46 (from 5000ft to FL400). It also contains part of LCTRA04 (from MSL to FL350).

The major military training and operations areas are shown in red to the east of the yellow line in the map. Reservation of these areas results in constraints to available route options and may also reduce the available capacity for general air traffic.

In 2017, 12,966 minutes of en route ATFM delay were attributed to military operations and training taking place in the LCCCS0 sector.

On 15th July 2017 at 14:00 UTC the airspace use plan for Nicosia FIR was published. This AUP included the airspace bookings for Sunday 16th July and was valid until the 17th July at 06:00 UTC.

No bookings were made for LCD44, LCD45 or LCD46 during that period. LCTRA04 was not booked during 17th July 2017.

Meteorological conditions on the day of operations**:**
As part of the Daily EUROCONTROL Network Weather Assessment, the Network Manager had issued an en route weather alert.

Neighbouring Flow Management Positions (in Greece and Turkey) to Nicosia ACC did not attribute any delays to adverse weather phenomena on 16th July.

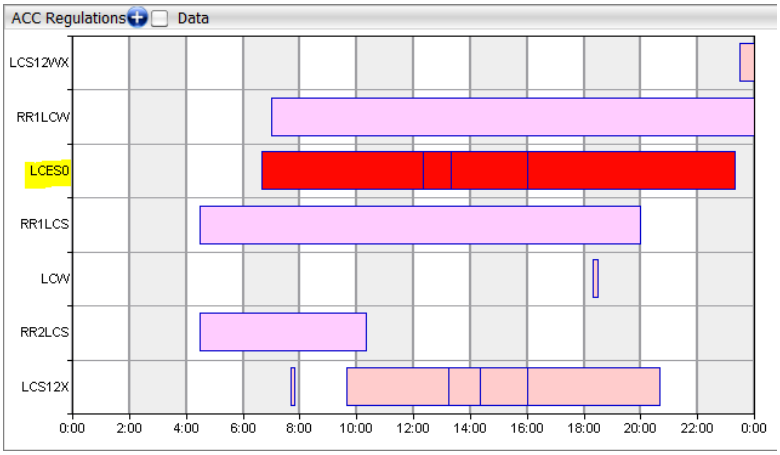
CONVECTION
09-24z OCNL CB S Italy to S Greece FL300 – 350.
[From 0900 - midnight UTC occasional cumulonimbus cloud from South Italy to South Greece.]

Evolution of Capacity constraints and ATFM regulations for LCCCES0 sector (16/07/2017)

It is evident that the regulated capacity varied between 21 and 23 aircraft per hour even though the declared capacity for sector LCCCES0 is 24 aircraft per hour. No explanation was provided for the reduction from the declared capacity.

It is also evident that ATFM regulations were applied on another collapsed sector (LCCCS12) attributed to ATC staffing.

Furthermore, several re-routing scenarios were applied to prevent airspace users from filing flight plans through either the southern or western sectors in the Nicosia FIR, in effect reducing traffic demand in the Nicosia FIR.



ACC Regulations | Data

ID	LCES016	LCES016	LCES016	LCES016
TV	LCES0	LCES0	LCES0	LCES0
RefLoc	LCCCES0	LCCCES0	LCCCES0	LCCCES0
StartsDayBefore	No	No	No	No
Open	06:40	12:20	13:20	16:00
Close	12:20	13:20	16:00	23:20
Capacity	21	22	23	21
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 6: LCCCES0 sector – regulations on 16th July 2017

Summary

- Traffic demand was above the regulated capacity in the LCCCES0 sector: the regulated capacity was set at levels below the normal declared capacity.
- Traffic demand was, at times above the declared capacity in the LCCCES0 sector: the declared capacity in the LCCCES0 sector is less than 90% of what it was in 2012 & 2013.

- Neither planned military activity, nor adverse weather phenomena, constrained the available capacity in the LCCCES0 sector.
- Operation of the collapsed LCCCES0 sector significantly constrained capacity that would have been available if the LCCCE1/LCCCE and the LCCCE2 sectors were opened separately.

Conclusions

Although peak traffic demand in that portion of the Mediterranean is low to moderate (99th percentile demand peaks <30 aircraft per hour) at times (5%) the hourly demand is greater than the declared capacity of the collapsed sector LCCCES0 (24).

Regulating sector LCCCES0 at the declared capacity from 2012 – 2013 (27) would reduce the number of hours where demand is greater than capacity by more than 60%.

Opening both E1 and E2 sector simultaneously would reduce the number of hours where demand is greater than declared capacity by 67%.

The regulated capacity (21- 23) was less than the declared capacity (24) although no reason can be determined and neither adverse weather nor planned military activity seem to be a factor.

Capacity constraints resulting from unplanned military activity could explain the reduction in available capacity but this is not transparent if delays are simply attributed to ATC capacity. (If the causes of capacity constraints are not properly identified they cannot be resolved).

In the opinion of the PRC, the failure to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

The PRC notes that re-routing scenarios prevent traffic from filing via the Nicosia FIR and thus efforts appear to be concentrated on eliminating demand rather than providing additional capacity.

PRC Questions (See Section 3.2.1 for ANSP response)

A reduction in regulated capacity (from the declared capacity), up to 12%, is observed for the entire period of regulation, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. No obvious additional factor (such as military operations and training or adverse weather) is identified as preventing the deployment of the full declared sector capacity.

The declared capacity of the LCCCES0 sector in 2017 (24) is less than 90% of what was already deployed in 2012 (27), which presents itself as a permanent internal constraint on airspace users wishing to fly through this portion of airspace.

Regulating traffic at capacity levels below the published declared capacity (without providing an explanation) or publishing declared capacity levels, and regulating traffic, at levels lower than historic figures for the same sector configuration highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “to accurately identify specific capacity constraints that

adversely impact the service provided to airspace users" & "ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated"

Another previous PRC recommendation, adopted by the Provisional Council and Permanent Commission, requested States "to review sector capacities, both with and without airspace restrictions, to increase network performance."

Q1: What process is in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

The original capacity constraint in the Nicosia FIR was due to the decision to open a collapsed sector LCCCES0 instead of opening two separate sectors. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to **"**provide capacity to meet demand instead of regulating demand to meet reduced capacity" & "to ensure that capacity is made available during peak demand."

Q3: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

The LCCCES0 sector has been a capacity bottleneck for several years. Although peak traffic demand in that portion of the Mediterranean is low to moderate (99th percentile demand peaks <30 aircraft per hour) at times (5%) the hourly demand is greater than the declared capacity of the collapsed sector LCCCES0 (24).

Regulating sector LCCCES0 at the declared capacity from 2012 – 2013 (27) would reduce the number of hours where demand is greater than capacity by more than 60%.

Opening both E1 and E2 sector simultaneously would reduce the number of hours where demand is greater than declared capacity by 67%.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q4: What specific plans are in place to increase both current and future capacity in the LCCCES0 sector and or in both the LCCCE1 and LCCCE2 sectors to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.2.1.

2.3 Canarias ACC: Norte Este sector GCCCRNE

6997 minutes of delay attributed to ATC capacity on Saturday 25/02/2017 from 10:40 to 20:20.

GCCCRNE sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	27951	49474
2016	44423	65576
2015	18197	46464
2014	12034	18839
2013	8279	8279
2012	6587	7407

Table 7: Annual ATFM delays attributed to the GCCCRNE sector

Sector infrastructure: The Norte Este sector is located in the east of the Canarias FIR. It is an elemental sector, situated above and around the Canarias Este approach airspace. The declared capacity of the sector is 38 aircraft per hour.

Declared capacity	2017	2016	2015	2014	2013	2012
Norte Este sector	38	38	38	38	38	38

Table 8: Historic declared capacity of Norte Este sector

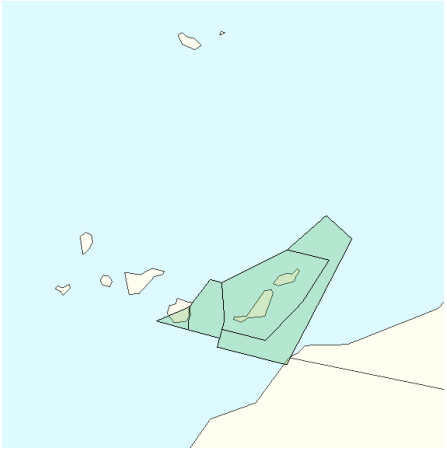


Figure 7: Canarias ACC: Norte Este sector GCCCRNE

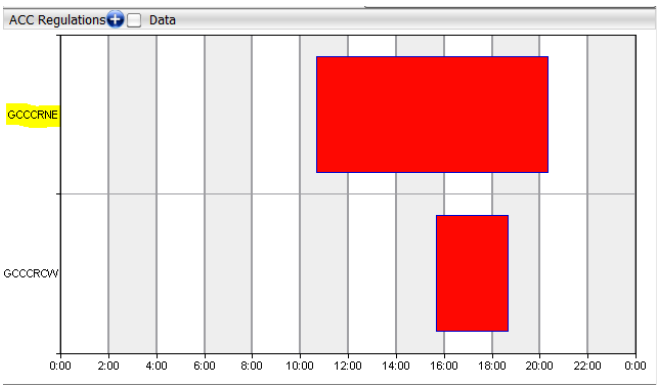
The declared sector capacity for the Norte Este sector has remained constant at 38 aircraft per hour since 2012.

Civil Military airspace structures: The main military operations and training areas within the Canarias FIR are located to the south and west of the islands in the GCD79 complex.

The Norte Este sector contains no military operations and training areas that impact on available route options and or on available capacity for general air traffic.

Meteorological conditions on the day of operations: No significant adverse weather phenomena were reported for 25th February 2017.

Evolution of Capacity constraints and ATFM regulations for Norte Este sector GCCCRNE (25/02/2017)



ACC Regulations	Data	
ID	GCRCW25	GCRNE25
TV	GCCCRCW	GCCCRNE
RefLoc	GCCCRCW	GCCCRNE
StartsDayBefore	No	No
Open	15:40	10:40
Close	18:40	20:20
Capacity	32	38
Reason	ATC CAPACITY	ATC CAPACITY

Figure 8: Norte Este sector GCCCRNE – regulations on 25 February 2017

The graphic shows that the regulated capacity was equal to the declared capacity (38) for the entire duration of the regulation.

Since GCCCRNE is an elemental sector, it is not possible to split it into two or more sectors to handle additional traffic.

Summary

- Traffic demand was above the regulated capacity, which was equal to the declared capacity, in the Norte Este sector.
- Neither planned military activity, nor adverse weather phenomena, constrained the available capacity in the Norte Este sector.

Conclusions

Peak traffic demand in that portion of the Canarias FIR is moderate-to-high (99th percentile of demand peaks <52 aircraft per hour) at times (≈5%) the hourly demand is greater than the declared capacity of the sector GCCCRNE (38).

There have been no increases in declared capacity in the Norte Este sector in the last six years, despite significant capacity attributed delays resulting in additional costs to airspace users of approximately €1.2M in 2014; €1.8M in 2015; €4.4M in 2016 and €4.9M in 2017.

Increasing the sector capacity of GCCCRNE sector from 38 to a declared capacity of 45 would reduce the number of hours where demand is greater than declared capacity by 60%.

PRC Questions (See Section 3.3.1 for ANSP response)

The GCCCRNE sector has been a capacity bottleneck for several years resulting in additional costs to airspace users of approximately €1.2M in 2014; €1.8M in 2015; €4.4M in 2016 and €4.9M in 2017.

Peak traffic demand in that portion of airspace is moderate to high (99th percentile demand peaks <52 aircraft per hour) at times (≈5%) the hourly demand is greater than the declared capacity of the collapsed sector GCCCRNE (38).

There have been no increases in declared capacity for the GCCCRNE sector in six years. Increasing declared capacity from 38 to 45 would already have provided a significant reduction in hours where demand exceeds capacity in 2017, circa 60%.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to “develop and implement capacity plans which are at minimum, in line with reference capacity profile…”; “taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…” & “… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth.”

Q1: What specific plans are in place to increase both current and future capacity in the GCCCRNE sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.3.1.

2.4 Maastricht UAC Deco Sectors: Delta West Low FL245-FL355

6492 minutes of delay attributed to ATC capacity on Thursday 22/06/2017 from 07:40 to 19:00.

Delta West Low sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	62,223	133,875
2016	49,648	115,025
2015	2,074	12,599

Table 9: Annual ATFM delays attributed to the Delta West Low sector

Sector infrastructure: The Delta West Low sector (EDYYD5WL) is located in the west of the Netherlands, Amsterdam FIR. The vertical limits are from FL245 – FL355. The Delta West High sector lies above and Amsterdam ACC controls the traffic below. The Delta West Low sector is an elemental sector and can be merged with the Delta West High sector (EDYYD5WH), to form the Delta sector configuration (EDYYDWSTX).

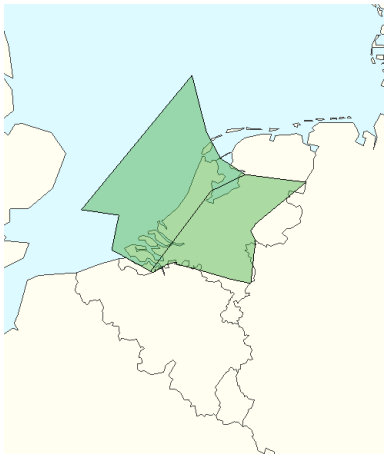


Figure 9: Maastricht UAC Deco Sectors

The declared capacity for the EDYYD5WL sector is 52 aircraft per hour. Declared capacity has been relatively static since 2012 although 2016 shows a significant drop which was almost recovered in 2017.

Declared capacity	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**
Delta West Low	52	48	53	53	53	53

Table 10: Historic declared capacity for Delta West Low sector

Civil Military airspace structures: The Delta West low sector contains significant military training and operations areas, shown in red between the two highlighted lines above. These areas include, in the north, EHD06 (FL660-FL055); EHD09 (FL660-FL055), EHD1D (FL660-FL055), EHR8A (FL660-FL065), EHR4A (FL285-FL065), TRA10A (FL660-FL095), EHR4E (FL285-A10,000) and TRA 12 (FL285-FL095) & TRA 12A (FL660-FL285) to the south. Reservation or activation of these areas results in constraints to both available route options and the available capacity for general air traffic.

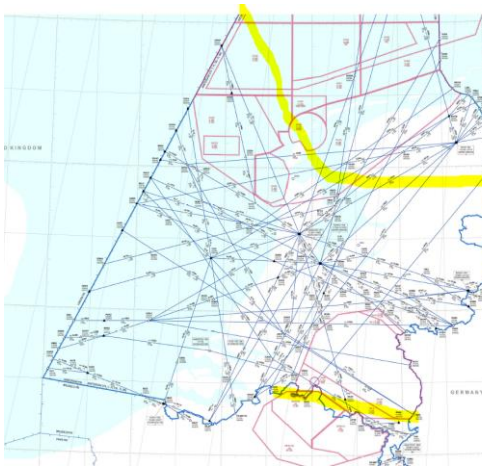


Figure 10: Military areas in Delta West Low sector

MUAC report that the reduction in declared capacity for Delta West Low sector in 2016 (from 53 to 48) was primarily due to military activity leading to increased complexity and workload. In 2017, MUAC was able to increase the declared capacity outside periods of military activity.

The Delta West low sector recorded 17,896 minutes of ATFM delay due to military operations and training in 2017; 11,387 minutes in 2016 and 7,997 minutes of delay in 2015.

On 22nd June 2017 the airspace use plan for the Netherlands showed the following reservations affecting the Delta West low sector:

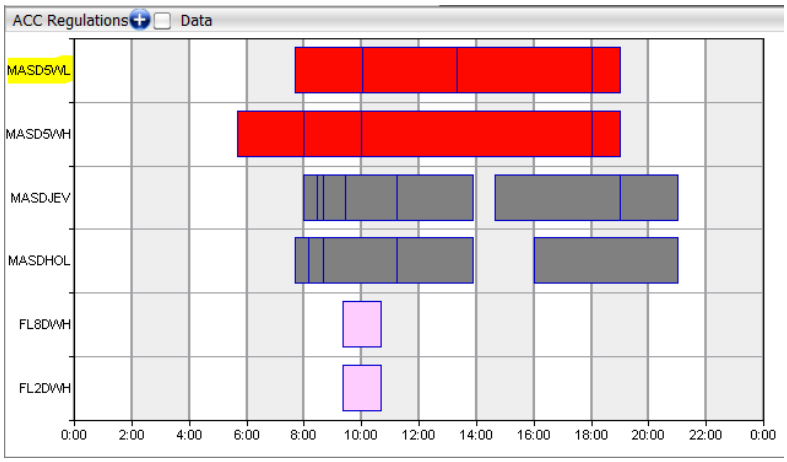
- EHR8A reserved from 06:00 22/06/2017 until 06:00 23/06/2017 from FL660 to FL65;
- EHTRA12 reserved from 08:00 to 09:00 and from 12:00 to 13:00 from FL285 to FL95;
- EHTRA12A reserved from 08:00 to 09:00 and from 12:00 to 13:00 from FL660 to FL285.

Further updates throughout the day confirmed these bookings with no cancellations recorded in the NOP.

Meteorological conditions on the day of operations: As previously noted in the analysis of the Brussels East sector, also in MUAC, the Network Manager issued an en route weather alert for the Benelux region and neighbouring FMPs attributed significant delays to weather throughout the day (22/06/2017).

Evolution of Capacity constraints and regulations for Delta West Low sector EDYYD5WL (22/06/2017)

It is evident that the regulated capacity was equal to the declared capacity of the Delta West Low sector (52) for the first 100 minutes of the regulations and for the final hour. However, for eight hours in between, the regulated capacity was significantly lower – reducing by up to 30%.



ACC Regulations	Data			
ID	YD5WL22E	YD5WL22E	YD5WL22E	YD5WL22E
TV	MASD5WL	MASD5WL	MASD5WL	MASD5WL
RefLoc	EDYYD5WL	EDYYD5WL	EDYYD5WL	EDYYD5WL
StartsDayBefore	No	No	No	No
Open	07:40	10:01	13:20	18:00
Close	10:01	13:20	18:00	19:00
Capacity	52	42	36	52
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 11: Delta West Low sector – regulations on 22nd June 2017

It is also evident that significant delays were experienced in the Delta West High sector EDYYD5WH from 05:40 to 19:00 (5000 minutes+), and that delays attributed to adverse weather (grey) were experienced in other sectors within the same sector group (DECO).

Summary

- Traffic demand was above the regulated capacity in the Delta West Low sector.
- Traffic demand was, at times, above the normal available capacity in the Delta West Low sector.
- Adverse weather constrained the normal available capacity in the Delta West Low sector.
- Military activity and bookings constrained the available capacity in the Delta West Low sector.

- By operating both Delta West High and Delta West Low sectors, simultaneously, no additional capacity constraints were applied by MUAC.

Conclusions

Traffic demand in that portion of Dutch airspace can be very high (≈ 90) and at times exceeds the declared capacity of the ATC sectors. This indicates that MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users.

Capacity constraints resulting from military activity and adverse weather would explain the reduction in available capacity and the high delays but this is not transparent if delays are simply attributed to ATC capacity. (If the causes of capacity constraints are not properly identified they cannot be resolved). In the absence of sufficient capacity to meet the peak traffic demand, it is evident that the airspace needs to be effectively managed to provide the optimum benefit to all airspace users.

Increasing capacity within the Delta West Low sector to 62 – equal to the declared capacity of the Delta West high sector would satisfy traffic demand for 95% of the hours of traffic demand in 2017.

The PRC notes that the declared capacity in Delta West Low sector is less now than it was in 2012.

PRC Questions (See Section 3.1.2 for ANSP response)

A significant reduction in regulated capacity, up to 30%, is observed between 10:01 and 18:00, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. It is obvious that an additional factor (most likely, either military operations and training, or adverse weather) prevented the deployment of the full declared sector capacity, but unless it is identified it cannot be resolved or mitigated against in the future.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “to accurately identify specific capacity constraints that adversely impact the service provided to airspace users” & “ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated”

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

Traffic demand in that portion of Dutch airspace can be very high (≈ 90) and at times exceeds the declared capacity of the ATC sectors. This indicates that MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users.

Increasing capacity within the Delta West Low sector to 62 – equal to the declared capacity of the Delta West high sector would satisfy traffic demand for 95% of the hours of traffic demand in 2017.

The PRC notes that the declared capacity in Delta West Low sector is less now than it was in 2012. Publishing declared capacity levels, and regulating traffic, at levels lower than historic figures for the same sector configuration highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

A previous PRC recommendation, adopted by the Provisional Council and Permanent Commission, requested States "to review sector capacities, both with and without airspace restrictions, to increase network performance."

Additional previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

Q3: What specific plans are in place to increase both current and future capacity in the Delta West Low sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.1.2.

2.5 Marseille ACC East Sectors: LFMMSBAM sector (LFMST + LFMBT + LFMAJ + LFMMN)

5224 minutes of delay attributed to ATC capacity on Saturday 30th September from 07:40 to 17:00.

LFMMSBAM sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	54870	74227
2016	13526	15493
2015	8281	11459
2014	21234	25196
2013	21903	38038

Table 11: Annual ATFM delays attributed to the LFMMSBAM sector

Sector infrastructure: The LFMMSBAM sector is located in the south-eastern corner of France and over Corsica. It is a collapsed sector comprising four elemental sectors LFMMST, LFMMBT, LFMMAJ and LFMMMN. Its vertical dimensions are up to FL245 but it excludes the NICE TMA which is controlled by NICE APP.

The individual sectors can be opened independently or in several different combinations. Each configuration has its own respective declared capacity. The various configurations are shown below with the respective declared capacity shown in brackets ().

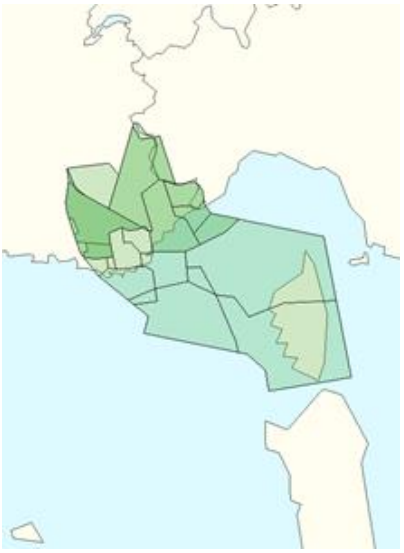


Figure 12: LFMMSBAM sector

LFMM…		SAB (30)	BTAJ (38)	12MNST (38)	BAM (40)	STAJ (27)	MNBT (29)
SBAM (46)	ST (31)						
	BT (28)						
	AJ (27)						
	MN (38)						
Potential declared capacity (up to…)	31 +28 +27+38 =124	30 + 38 =68	38 + 31 +38 =107	38 + 28 + 27 =93	40 + 31 =71	27+ 28 + 38 =93	29 + 31 +27 =87

Table 12: Options for declared capacity in LFMMSBAM sector

Civil Military airspace structures: The LFMMSBAM sector contains several significant military operations and training areas as is evident from the en route chart published in the France AIP. See areas marked in brown on section of chart to side.

These areas include: LFD54, LFR138 and LFR108 and TSA 44 over Corsica.

Reservation or activation of these areas results in constraints to both available route options and the available capacity for general air traffic.

In 2017, no en route ATFM delays were attributed to military operations or training in the LFMMSBAM sector.

Figure 13: Military areas in the LFMMSBAM sector

On Saturday 30th September 2017 the airspace use plan, and updated use plans, for France showed that none of the relevant Restricted or Segregated areas were reserved for military operations or training.

Meteorological conditions on the day of operations: Adverse weather phenomena can impact available ATC capacity at airports and in en route situations. As part of the Daily EUROCONTROL Network Weather Assessment, the Network Manager had issued an en route weather alert forecast.

ISOL CB ACT top FL 320-340: LGGG/MD,LFMM,LECB/P.LGGG/MD,LTBB/AA [Isolated cumulonimbus activity is forecasted with tops of cloud between FL320-340. LFMM is Marseille FIR]

Neighbouring Flow Management Positions (FMPs) to Marseille ACC attributed delays to weather phenomena on 30th September.

Name of FMP	Timing of Regulation	Impact of ATFM weather Regulation (min.)
Barcelona ACC FMP	16:00 to 18:20	265
Paris ACC FMP	05:30 to 07:00	150
Total		415

Table 13: Weather related ATFM delays at FMPs neighbouring Marseille ACC on 30 Sept 2017

Evolution of Capacity constraints and ATFM regulations for LFMMSBAM sector (30/09/2017)

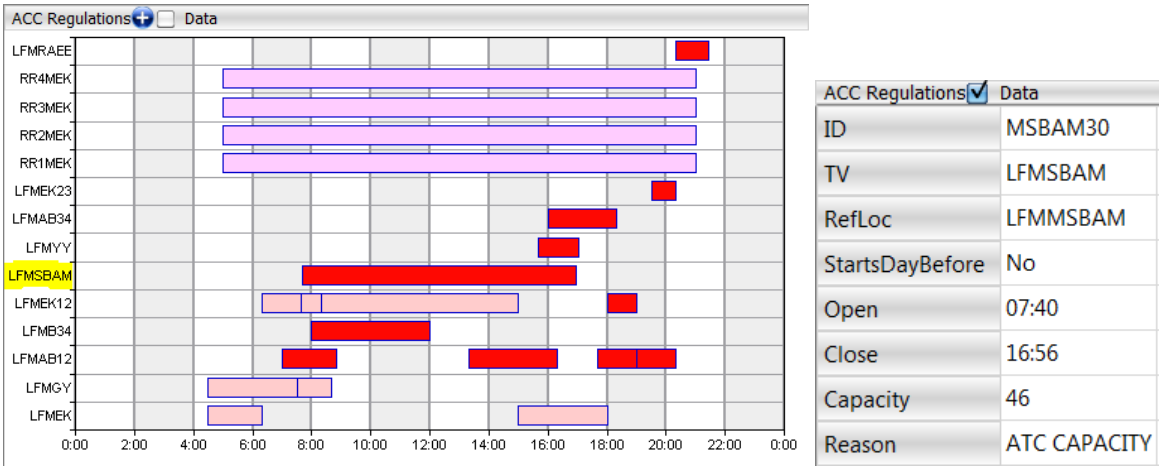


Figure 14: LFMMSBAM sector – regulations on 30 September 2017

It is evident that the regulated capacity was equal to the declared capacity of the collapsed LFMMSBAM sector (46) during the regulated period.

Summary

- Traffic demand was above the regulated, and the normal available, capacity in the Marseille SBAM sector.
- There was no military activity to constrain capacity in the SBAM sector during the regulated period.
- Although adverse weather caused some delays in neighbouring airspace: Paris and Barcelona, there is no record of it causing capacity constraints within the airspace controlled by Marseille ACC.

- Operation of the collapsed Marseille SBAM sector significantly constrained capacity that would have been available if the four elemental sectors: LFMMST, LFMMBT, LFMMAJ and LFMMMN sectors were opened separately.

Conclusions

Traffic demand in that portion of French airspace (collapsed LFMMSBAM sector) can be very high (≈ 95) and at times exceeds the declared capacity. In 2017, the traffic demand was higher than the declared capacity of the collapsed SBAM sector for 1048 1hour-periods.

However, when the sector is de-collapsed into the four separate LFMMST, LFMMBT, LFMMAJ and LFMMMN sectors, the number of 1-hour periods where traffic demand is higher than declared capacity is quite different:

Sector	Declared capacity	No of hours demand above declared capacity
LFMMST	31	14
LFMMBT	28	14
LFMMAJ	27	31
LFMMMN	38	0
		59

Table 14: Hours of demand above declared capacity

A total of 59 1-hour periods where demand exceeds available declared capacity instead of 1048, a reduction of 94%.

In the opinion of the PRC, the failure to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former the capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

The PRC notes that four separate re-routing scenarios were also applied in Marseille ACC during the regulated period preventing traffic from filing through sectors in Marseille ACC. Thus it appears that efforts were focussed on eliminating demand rather than providing additional capacity.

PRC Questions (See Section 3.4.1 for ANSP response)

It is evident that the original capacity constraint in the Marseille FIR was due to the decision to open a collapsed sector LFMMSBAM instead of opening the four separate constituent sectors. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “provide capacity to meet demand instead of regulating demand to meet reduced capacity” & “to ensure that capacity is made available during peak demand.”

Q1: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

The PRC notes the application of re-routing scenarios within the Marseille FIR, preventing traffic from filing through certain sectors in Marseille ACC. Presumably, these scenarios are imposed to reduce the traffic demand in certain sectors due to a lack of capacity within those sectors. Obviously, this identifies a need to increase declared capacity in those sectors from what is currently available, both to handle future traffic levels and also to satisfy the current airspace users' requirements without excessive restrictions.

Q2: What specific plans are in place to increase both current and future capacity in the Marseille ACC sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.4.1.

2.6 Marseille ACC East Sectors: LFMMSBAM sector (LFMST + LFMBT + LFMAJ + LFMMN)

5202 minutes of delay attributed to ATC capacity on Saturday 22nd July from 15:45 to 20:00.

Sector infrastructure: LFMMSBAM sector - as above.

Civil Military airspace structures: - as above

On 22nd July 2017 the airspace use plan, and updated use plans, for France showed that none of the relevant Restricted or Segregated areas were reserved for military operations or training.

Meteorological conditions on the day of operations: Adverse weather phenomena can impact available ATC capacity at airports and in en route situations. As part of the Daily EUROCONTROL Network Weather Assessment, the Network Manager had issued an en route weather alert forecast.

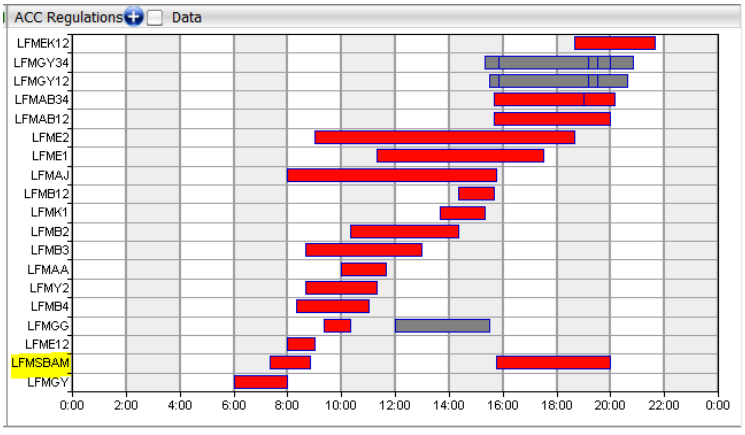
Severe Storm:
From 12-15Z SCT CB in Alpine region, SE France, N-Germany & Czechia . Cloud tops to FL350-400
[Severe storm expected from 12:00 to 15:00 scattered cumulonimbus cloud in …south east

Neighbouring Flow Management Positions (FMPs) to Marseille ACC attributed delays to weather phenomena on 22nd July.

Name of FMP	Timing of Regulation	Impact of ATFM weather Regulation (min.)
Barcelona ACC FMP	16:20 to 21:00	393
Bordeaux ACC FMP	15:00 to 20:00	2,603
Marseille ACC FMP	12:00 to 21:00	6,340
Geneva ACC FMP	12:20 to 22:20	1,806
Total		11,142

Table 15: Weather related ATFM delays at neighbouring FMPs to MUAC on 22 July 2017

Evolution of Capacity constraints and ATFM regulations for LFMMSBAM sector (22/07/2017)



ACC Regulations	Data	
ID	MSBAM22	MBAM22
TV	LFMSBAM	LFMSBAM
RefLoc	LFMMSBAM	LFMMSBAM
StartsDayBefore	No	No
Open	07:20	15:45
Close	08:50	20:00
Capacity	46	46
Reason	ATC CAPACITY	ATC CAPACITY

Figure 15: LFMMSBAM sector – regulations on 22 July 2017

It is evident that the regulated capacity was equal to the declared capacity of the collapsed LFMMSBAM sector (46) during the regulated period.

Summary

- Traffic demand was above the regulated, and the normal available, capacity in the Marseille SBAM sector.

- There was no military activity to constrain capacity in the SBAM sector during the regulated period.
- Although adverse weather caused significant delays in neighbouring airspace, even within the same FIR, it did not constrain the available capacity for the Marseille SBAM sector.
- Operation of the collapsed Marseille SBAM sector significantly constrained capacity that would have been available if the four elemental sectors: LFMMST, LFMMBT, LFMMAJ and LFMMMN sectors were opened separately.

Conclusions

Similarly to the situation on Saturday 30th September, the PRC finds that the main capacity constraint impacting traffic on Saturday 22nd July was due to the use of a collapsed sector LFMMSBAM instead of opening the constituent sectors LFMMST, LFMMBT, LFMMAJ and LFMMMN.

In the opinion of the PRC, the failure to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former the capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

PRC questions (See Section 3.4.1 for ANSP response)

It is evident that the original capacity constraint in the Marseille FIR was due to the decision to open a collapsed sector LFMMSBAM instead of opening the four separate constituent sectors. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “provide capacity to meet demand instead of regulating demand to meet reduced capacity” & “to ensure that capacity is made available during peak demand.”

Q1: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

The PRC notes the application of re-routing scenarios within the Marseille FIR, preventing traffic from filing through certain sectors in Marseille ACC. Presumably, these scenarios are imposed to reduce the traffic demand in certain sectors due to a lack of capacity within those sectors. Obviously, this identifies a need to increase declared capacity in those sectors from what is currently available, both to handle future traffic levels and also to satisfy the current airspace users’ requirements without excessive restrictions.

Q2: What specific plans are in place to increase both current and future capacity in the Marseille ACC sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.4.1.

2.7 Paris ACC East Sectors: LFFFLMH sector (LFFPU + LFFTU + LFFHP + LFFUT + LFFUP sectors)

5144 minutes of delay attributed to ATC capacity on Saturday 11th February from 06:40 to 17:30.

Paris ACC East sector LFFLMH	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	11,420	41,901
2016	9,261	25,371
2015	11,133	24,302
2014	14,834	36,577

Table 16: Annual ATFM delays attributed to the LFFFLMH sector

Sector infrastructure: The Paris ACC LFFLMH sector is located to the south east of Paris. It is a collapsed sector comprised of five elemental sectors: LFFPU, LFFTU, LFFHP, LFFUT and LFFUP. Its vertical limits are from FL195 to unlimited. The LFFLMH sector has a declared capacity of 48 aircraft per hour.

The individual sectors can be opened independently or in several different combinations. Each configuration has its own respective declared capacity

The various configurations are shown below with the respective declared capacity shown in brackets ().

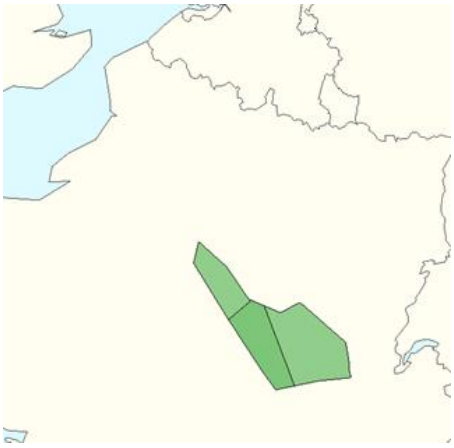


Figure 16: Paris ACC East Sectors: LFFFLMH

LFF…		…MHPT (40)	…UPPU (38)	…LPT (42)	…MPT (22)	…LMPT (40)	…UTTU (38)
…LMH (48)	…PU (?)						
	…TU (?)						
	…HP (38)						
	…UT (38)						
	…UP (32)						
Potential declared capacity (up to…)	38 + 38 + 32 = 108	40 + 38 + 32 = 110	38 + 38 + 38 = 114	42 + 38 = 80	22 + 38 + 38 + 32 = 130	40 + 38 = 78	38 + 38 + 32 = 108

Table 17: Options for declared capacity in LFFLMH sector

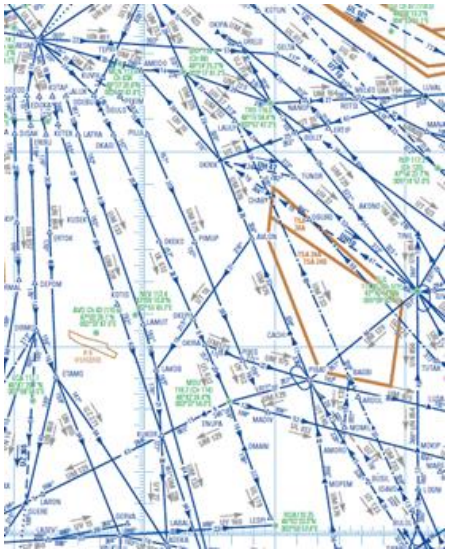


Figure 17: Military areas in the LFFLMH sector

Civil Military airspace structures**:** The LFFLMH sector contains two significant military operations and training areas, the TSA 24A and TSA 24B from FL195 to UNL (depicted in brown on chart).

Reservation or activation of these areas can result in constraints to both available route options and the available capacity for general air traffic.

In 2017, no en route ATFM delays were attributed to military operations or training in the LFFLMH sector.

On Saturday 11th February 2017 the airspace use plan, and updated use plans, for France showed that none of the relevant Restricted or Segregated areas were reserved for military operations or training.

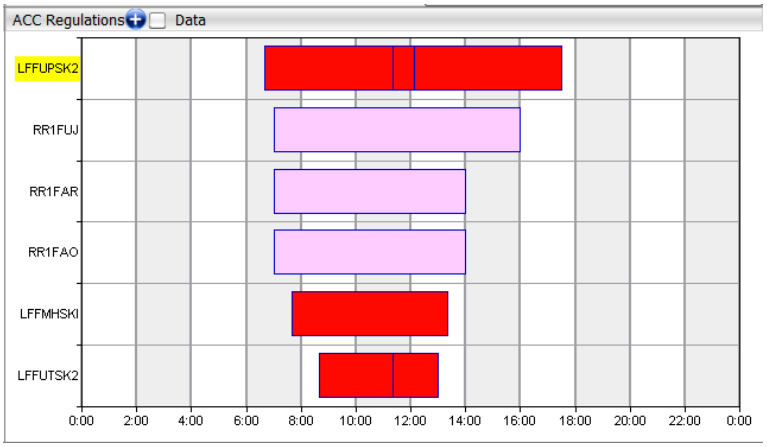
Meteorological conditions on the day of operations: Adverse weather phenomena can impact available ATC capacity at airports and in en route situations.

No adverse weather phenomena were forecast or reported by the Network Manager on Saturday 11th February.

Evolution of Capacity constraints and ATFM regulations for LFFLMH sector (11/02/2017)

It is evident that the regulated capacity (between 24 and 29) for the entire regulated period was significantly lower than the declared capacity for the LFFFMH sector (48). No explanation was provided for the reduction from the declared capacity.

It is also evident that re-routing scenarios were applied for a significant length of time, preventing airspace users from filing flight plans through the LFFLMH sector (RR1FUJ), in effect reducing traffic demand in the LFFLMH sector.



ACC Regulations			
ID	FUPSK211	FUPSK211	FUPSK211
TV	LFFUPSK2	LFFUPSK2	LFFUPSK2
RefLoc	LFFFLMH	LFFFLMH	LFFFLMH
StartsDayBefore	No	No	No
Open	06:40	11:20	12:08
Close	11:20	12:08	17:30
Capacity	24	27	29
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 18: LFFLMH sector – regulations on 11 Feb 2017

Summary

- Traffic demand was above the regulated capacity in the LFFLMH sector: the regulated capacity was set at levels significantly lower than the normal declared capacity.
- Traffic demand was, at times above the declared capacity of the LFFLMH sector.
- Neither military activity, nor adverse weather phenomena, constrained the available capacity in the LFFLMH sector.
- Operation of the collapsed LFFLMH sector significantly constrained capacity that would have been available if the LFFPU, LFFTU, LFFHP, LFFUT and LFFUP sectors were opened individually or in different combinations.

Conclusions

The PRC finds that the main capacity constraint impacting traffic on Saturday 11th February was due to the use of a collapsed sector LFFLMH instead of opening the constituent sectors according to traffic demand.

The collapsed sector was operated at a regulated capacity significantly lower than the normal declared capacity although no explanation is given in the description of the ATFM regulations and neither military operations and training nor adverse weather appear to be the cause of the reduction in capacity.

In the opinion of the PRC, the failure to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former, the capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

PRC questions (See Section 3.4.2 for ANSP response)

A reduction in regulated capacity (from the declared capacity), up to 50%, is observed during the period of regulation, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. No obvious additional factor (such as military operations and training or adverse weather) is identified as preventing the deployment of the full declared sector capacity.

Regulating traffic at capacity levels below the published declared capacity (without providing an explanation) or publishing declared capacity levels, and regulating traffic, at levels lower than historic figures for the same sector configuration highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “to accurately identify specific capacity constraints that adversely impact the service provided to airspace users” & “ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated”

Q1: What process is in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

The original capacity constraint was due to the decision to open a collapsed sector LFFLMH instead of opening more of the five constituent sectors, according to traffic demand. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “provide capacity to meet demand instead of regulating demand to meet reduced capacity” & “to ensure that capacity is made available during peak demand.”

Q3: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

➔ The corresponding responses provided by the ANSP can be found in Section 3.4.2.

2.8 Maastricht UAC Deco Sectors: Delta West High FL355+

5020 minutes of delay attributed to ATC capacity on Thursday 22/06/2017 from 05:40 to 19:00.

Delta High sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	65,775	127,271
2016	99,187	160,537
2015	5,321	21,278

Table 18: Annual ATFM delays attributed to the Delta West High sector

Sector infrastructure: The Delta West High sector (EDYYD5WH) is located in the west of the Netherlands, Amsterdam FIR. The vertical limits are from FL355 to unlimited. The Delta West Low sector lies below. The Delta West High sector is an elemental sector and can be merged with the Delta West Low sector.

The lateral dimensions of the Delta West High sector are the same as the Delta West low sector previously presented. The declared capacity for the EDYYD5WH sector is 62 aircraft per hour. The evolution of declared capacity, in recent years, is presented below.

Declared capacity	**2017**	**2016**	**2015**	**2014**	**2013**	**2012**
Delta West High	62	62	58	58	58	58

Table 19: Historic declared capacity of Delta West high sector

Civil Military airspace structures: The Delta West high sector contains significant military training and operations areas, as shown for the Delta West low sector previously. These areas include, in the north, EHD06 (FL660-FL055); EHD09 (FL660-FL055), EHD1D (FL660-FL055), EHR8A (FL660-FL065), TRA10A (FL660-FL095) & TRA 12A (FL660-FL285) to the south. Reservation or activation of these areas results in constraints to both available route options and the available capacity for general air traffic.

The Delta West high sector recorded 7,588 minutes of ATFM delay due to military operations and training in 2017; 12,571 minutes in 2016 and 3,749 minutes of delay in 2015.

On 22nd June 2017 the airspace use plan for the Netherlands showed the following reservations affecting the Delta West high sector:

- EHR8A reserved from 06:00 22/06/2017 until 06:00 23/06/2017 from FL660 to FL65;
- EHTRA12A reserved from 08:00 to 09:00 and from 12:00 to 13:00 from FL660 to FL285.

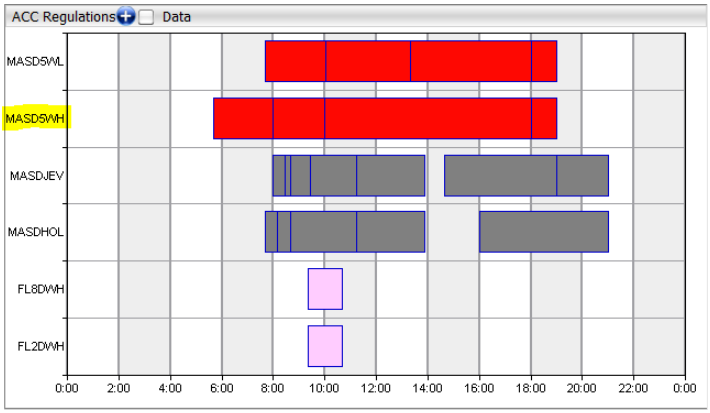
Further updates throughout the day confirmed these booking with no cancelations recorded in the NOP.

Meteorological conditions on the day of operations: As previously noted in the analysis of the Brussels East sector, also in MUAC, the Network Manager has issued an en route weather alert for the Benelux region and neighbouring FMPs attributed significant delays to weather throughout the day (22/06/2017).

Evolution of Capacity constraints and ATFM regulations for Delta West Low sector EDYYD5WL.
It is evident that the regulated capacity (64) was above the declared capacity of the Delta West high sector (62) for the first 150 minutes of the regulations.

From 08:00 to 10:00 and from 18:00 to 19:00 the regulated capacity was equal to the declared capacity of the sector. However, it is evident that the regulated capacity (50) was significantly lower than the declared capacity for a period of eight hours from 10:00 to 18:00.

It is also evident that neighbouring sectors EDYYDJEV and EDYYHOL experienced significant weather attributed delays during the day.



ACC Regulations ☑ Data

ID	YD5WH22M	YD5WH22M	YD5WH22M	YD5WH22M
TV	MASD5WH	MASD5WH	MASD5WH	MASD5WH
RefLoc	EDYYD5WH	EDYYD5WH	EDYYD5WH	EDYYD5WH
StartsDayBefore	No	No	No	No
Open	05:40	08:00	10:00	18:00
Close	08:00	10:00	18:00	19:00
Capacity	64	62	50	62
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 19: EDYYD5WL sector – regulations on 22 June 2017

Summary

- Traffic demand was above the regulated capacity in the Delta West high sector.
- Traffic demand was, at times above the normal available capacity in the Delta West high sector, even above the heightened capacity of 64 for the first 140 minutes of the regulation.
- Adverse weather constrained the normal available capacity in the Delta West high sector.
- Military activity and bookings constrained the available capacity in the Delta West high sector.
- By operating both Delta West high sector and Delta West low sectors, simultaneously, no additional capacity constraints were applied by MUAC.

Conclusions

Traffic demand in that portion of Dutch airspace can be very high (>80) and at times exceeds the declared capacity of the ATC sectors. This indicates that MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users. The PRC notes that the Delta West high sector was able to deploy a capacity of 64, 2 above the official declared capacity. The question therefore is why the official declared capacity is not 64?

Capacity constraints resulting from military activity and adverse weather would explain the reduction in available capacity and the high delays but this is not transparent if delays are simply attributed to ATC capacity. (If the causes of capacity constraints are not properly identified they cannot be resolved). In the absence of sufficient capacity to meet the peak traffic demand, it is evident that the airspace needs to be effectively managed to provide the optimum benefit to all airspace users.

Increasing the declared capacity in the Delta West high sector to 64 would satisfy traffic demand for 95% of the hours of traffic demand in 2017.

PRC questions (See Section 3.1.3 for ANSP response)

A significant reduction in regulated capacity, circa 20%, is observed between 10:00 and 18:00, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. It is obvious that an additional factor (most likely, either military operations and training, or adverse weather) prevented the deployment of the full declared sector capacity, but unless it is identified it cannot be resolved or mitigated against in the future.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States "to accurately identify specific capacity constraints that adversely impact the service provided to airspace users" & "ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated".

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

The PRC notes that regulated capacity (64) was higher than the declared capacity (62) for the first 140 minutes of the regulation. Regulating traffic at levels above declared capacity indicates a latent capacity that could be provided to airspace users at no cost to the ANSP.

A previous PRC recommendation, adopted by the Provisional Council and Permanent Commission, requested States "to review sector capacities, both with and without airspace restrictions, to increase network performance."

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

Traffic demand in that portion of Dutch airspace can be very high (>80) and at times exceeds the declared capacity of the ATC sectors. This indicates that MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users.

Although declared capacity has increased from 58 to 62 since 2014, the Delta West High sector continues to be a capacity bottleneck. Although increasing the declared capacity to 64 would address a lot of the capacity problems, there remains a requirement to add additional capacity to meet current traffic demand and to accommodate future traffic growth.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q3: What specific plans are in place to increase both current and future capacity in the Delta West High sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.1.3.

2.9 Canarias ACC: Norte Este sector GCCCRNE

4814 minutes of delay attributed to ATC capacity on Saturday 25/03/2017 from 14:00 to 20:20.

Sector infrastructure**:** Norte Este sector - as previously described.

Civil Military airspace structures: **-** The Norte Este sector contains no military operations and training areas that impact on available route options and or on available capacity for general air traffic.

Meteorological conditions on the day of operations: No significant adverse weather phenomena were reported for the relevant airspace for 25th March 2017.

Evolution of Capacity constraints and ATFM regulations for Norte Este sector GCCCRNE (25/03/2017)

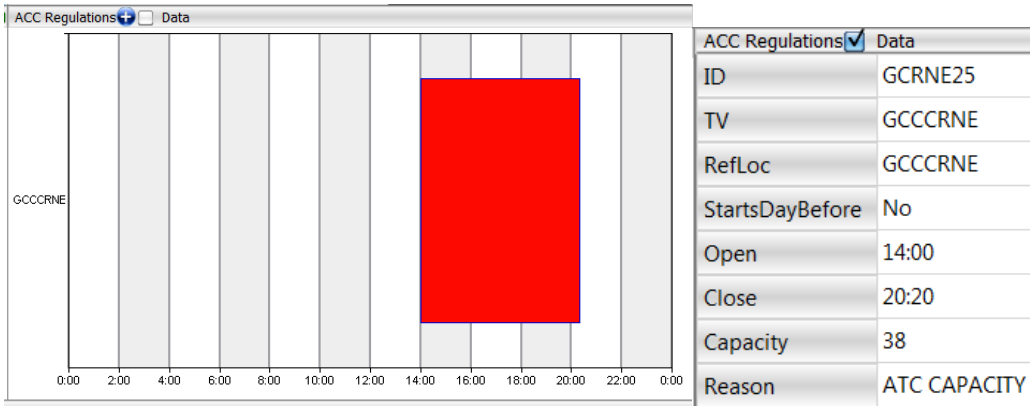


Figure 20: Norte Este sector GCCCRNE sector– regulations on 25 March 2017

The graphic shows that the regulated capacity was equal to the declared capacity (38) for the entire duration of the regulation.

Since GCCCRNE is an elemental sector, it is not possible to split it into two or more sectors to handle additional traffic.

Summary

- Traffic demand was above the regulated capacity, which was equal to the declared capacity, in the Norte Este sector.
- Neither planned military activity, nor adverse weather phenomena, constrained the available capacity in the Norte Este sector.

Conclusions

As previously discussed, at times (≈5%) the hourly demand is greater than the declared capacity of the sector GCCCRNE (38).

There have been no increases in declared capacity in the Norte Este sector in the last six years, despite significant capacity attributed delays resulting in additional costs to airspace users of approximately €1.2 million in 2014; €1.8 million in 2015; €4.4 million in 2016 and €2.8 million in 2017.

Based on 2017 traffic, increasing the sector capacity of GCCCRNE sector from 38 to a declared capacity of 45 would have reduced the number of hours where demand was greater than declared capacity from 511 to 202, a reduction of 60%.

PRC questions (See Section 3.3.1 for ANSP response)

The GCCCRNE sector has been a capacity bottleneck for several years resulting in additional costs to airspace users of approximately €1.2M in 2014; €1.8M in 2015; €4.4M in 2016 and €4.9M in 2017.

Peak traffic demand in that portion of airspace is moderate to high (99th percentile demand peaks <52 aircraft per hour) at times (≈5%) the hourly demand is greater than the declared capacity of the collapsed sector GCCCRNE (38).

There have been no increases in declared capacity for the GCCCRNE sector in six years. Increasing declared capacity from 38 to 45 would already have provided a significant reduction in hours where demand exceeds capacity in 2017, circa 60%.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q1: What specific plans are in place to increase both current and future capacity in the GCCCRNE sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.3.1.

2.10 Karlsruhe UAC West sector group: Soellingen sector (EDUUSLN13) FL245 to FL355

4463 minutes of delay attributed to ATC capacity on Saturday 12/08/2017 from 06:00 to 18:00.

Soellingen sector EDUUSLN13	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	44,470	102,377
2016	6,170	31,708
2015	4,992	7,179

Table 20: Annual ATFM delays attributed to Karlsruhe UAC West Soellingen sector

Sector infrastructure: The Soellingen sector low (EDUUSLN13) is located in the south west of Germany. The vertical limits are from FL245 to FL355. The Soellingen low sector is an elemental sector. Two sectors are located above: the Soellingen middle sector (EDUUSLN23) from FL355 to FL375 and the Soellingen high sector (EDUUSLN33) FL375+.

Declared capacity	2017	2016	2015	2014	2013	2012
Soellingen low	49	49	49	49	48	48

Table 21: Historic declared capacity for Soellingen low sector

The declared capacity for the Soellingen low sector has increased marginally from 48 to 49 aircraft per hour since 2012.

Figure 21: Soellingen sector low (EDUUSLN13)

Civil Military airspace structures: The Soellingen low sector (EDUUSLN13) contains several significant military operations and training areas, described in blue in the map. In the east: EDR305B and EDR305C (FL245 to UNL).

Reservation or activation of these areas can result in constraints to both available route options and the available capacity for general air traffic

In 2017, 22,672 minutes of en route ATFM delays were attributed to military operations or training in the EDUUSLN13 sector.

On Saturday 12th August 2017, the airspace use plan for Germany, and updated airspace use plans, showed no capacity constraints due to military activities or bookings.

Meteorological conditions on the day of operations: No significant adverse weather phenomena were reported for the relevant airspace for 12th August 2017.

Figure 22: Military areas in EDUUSLN13

Evolution of Capacity constraints and ATFM regulations for Soellingen low sector (EDUUSLN13) on 12th August 2017.

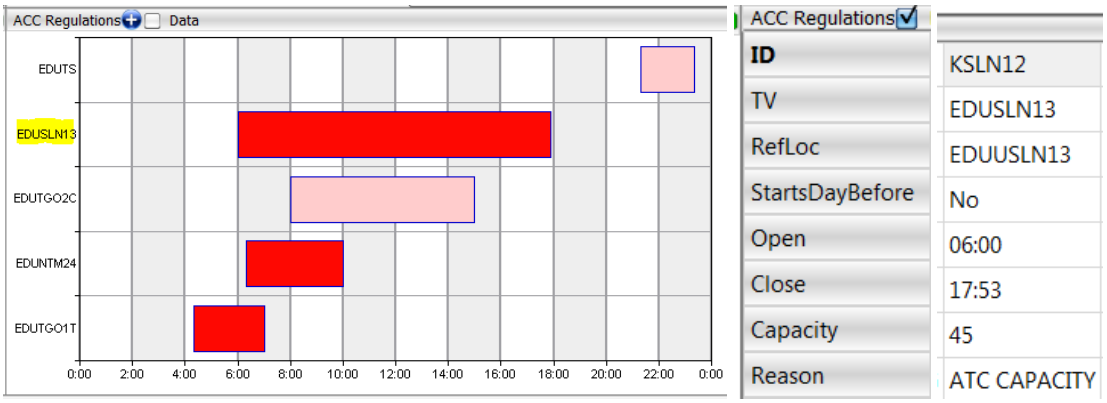


Figure 23: Soellingen low sector (EDUUSLN13) – regulations on 12 August 2017

It is evident that the regulated capacity (45) is less than the normal declared capacity of the EDUUSLN13 sector (49). No explanation was provided for the reduction in available capacity. Analysis of the initial traffic demand (prior to ATFM regulations) indicate only one hour-long period when traffic demand was higher than the normal declared capacity of the EDUUSLN13 sector (49) as opposed to six hour-long periods where the demand was higher than the reduced capacity of 45 aircraft per hour.

Since EDUUSLN13 is an elemental sector, it is not possible to split it into two or more sectors to handle additional traffic.

Summary

- Traffic demand was above the regulated capacity (45), which was less than the normal declared capacity in the EDUUSLN13 sector (49).
- Neither planned military activity, nor adverse weather phenomena, constrained the available capacity in the Soellingen low sector.

Conclusions

Traffic demand in that portion of German airspace can be quite high (>60) and at times exceeds the declared capacity of the ATC sectors. This indicates that the DFS and the national authorities need to continue to add capacity to meet the needs of the airspace users. The PRC note that the declared capacity of the Soellingen low sector has increased by only 1 aircraft per hour since 2012 – from 48 to 49.

Capacity constraints from military activity or from adverse weather could explain the reduction in available capacity (45) from the normal declared capacity level (49), however the PRC note the absence of military activity and adverse weather phenomena on the day in question in that portion of German airspace.

The PRC considers that attributing delays to ATC capacity, in cases where the available capacity has been reduced, reduces the transparency of the ATFM process and impedes the proper identification and resolution of capacity problems.

Deploying a reduced capacity of 45 aircraft per hour in the Soellingen low sector results in 158 hours when the traffic demand exceeds the (reduced) available capacity, based on 2017 traffic, whereas deploying the normal declared capacity of 49 aircraft per hour results in only 48 hours where demand exceeds capacity, a reduction of 70%.

The PRC notes that providing the normal declared capacity (49) in the Soellingen low sector would satisfy the traffic demand for 99% of the hours of traffic demand in 2017.

PRC questions (See Section 3.5.1 for ANSP response)

A reduction in regulated capacity (from the declared capacity), up to 8%, is observed for the entire period of regulation, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. No obvious additional factor (such as military operations and training or adverse weather) is identified as preventing the deployment of the full declared sector capacity.

Regulating traffic at capacity levels below the published declared capacity (without providing an explanation) highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to "to accurately identify specific capacity constraints that adversely impact the service provided to airspace users" & "ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated"

Q1: What process is in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

➔ The corresponding responses provided by the ANSP can be found in Section 3.5.1.

2.11 Nicosia ACC: NICOSIA LCCCS1 GND – UNL

4,406 minutes of delay attributed to ATC capacity on Sunday 09/04/2017 from 12:00 to 19:00.

ATFM delays attributed to LCCCS1 sector	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	55,926	73,673
2016	16,435	21,584
2015	21,717	24,693
2014	32,775	39,563

Table 22: Annual ATFM delays attributed to Nicosia LCCCS1 sector

Sector infrastructure**:** The LCCCS1 sector is located in the south of the Nicosia FIR. It is a collapsed sector comprised of sector S1 upper and S1 lower (with variable division level). The vertical limits of the LCCCS1 sector are from ground to unlimited.

Although technically the S1 lower and S1 upper sectors can be opened independently of each other, this is not foreseen in the sector opening configurations of Nicosia ACC. The vertical split is only made when the sectors are collapsed with other upper or lower sectors.

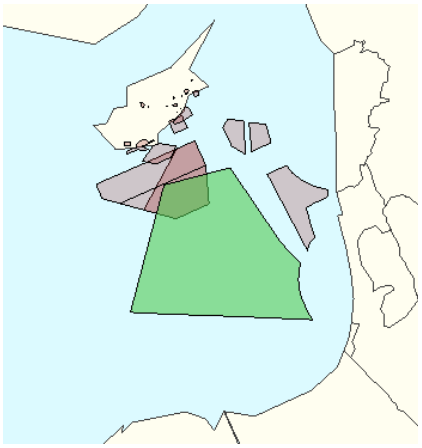


Figure 24: Nicosia LCCCS1 sector

Declared capacity	2017	2016	2015	2014	2013
LCCCS1 sector	28	28	28	28	28

Table 23: Historic declared capacity for LCCCS1 sector

The declared capacity of sector LCCCS1 sector is 28 aircraft per hour. It has been 28 aircraft per hour since the sector was formed in 2013.

Civil Military airspace structures: Sector LCCCS1 contains one significant complex of military operations and training areas: LCD4 (MSL-FL350) & LCD47 (GND-FL350).

The major military training and operations areas are shown in brown in the map. Reservation of the LCD4 results in constraints to available route options (G2/UG2) and may also reduce the available capacity for general air traffic.

In 2017, 8900 minutes of en route ATFM delays were attributed to military operations or training in the LCCCS1 sector.

On 9th April 2017 the airspace use plan for Cyprus, and for Nicosia FIR, contained no reservations or activations for either LCD4 or LCD47.

Meteorological conditions on the day of operations**:** No warnings or reports were recorded for adverse weather phenomena within the Nicosia FIR on 9th April 2017.

Evolution of Capacity constraints and ATFM regulations for LCCCS1 sector (09/04/2017)

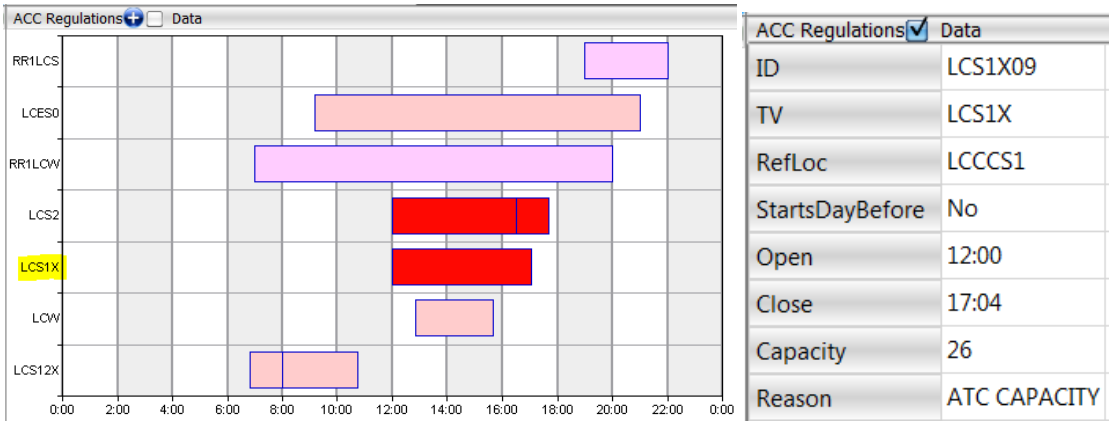


Figure 25: Nicosia ACC LCCCS1 sector – regulations on 09 April 2017

It is evident that the regulated capacity (26) is lower than the declared capacity for the LCCCS1 sector (28). No explanation was provided for the reduction from declared capacity.

Summary

- Traffic demand was above the regulated capacity in the LCCCS1 sector; the regulated capacity was set below the normal declared capacity;
- Traffic demand was at times above the normal declared capacity of the LCCCS1 sector: the declared capacity of the LCCCS1 sector has not increased since 2013;
- Neither planned military activity, nor adverse weather phenomena, constrained the available capacity in the LCCCS1 sector;
- Since the LCCCS1 sector is a collapsed sector, additional capacity should have been available if the sector was split into two separate sectors.

Conclusions

Peak traffic in that portion of the Nicosia FIR is moderate (99th percentile of demand peaks ≈40), but at times (17%) the hourly demand is greater than the declared capacity of the sector (28).

Deploying the reduced capacity (26) instead of the normal declared capacity (28) increases the proportion of hours where traffic demand is greater than available capacity to 22%.

Capacity constraints resulting from unplanned military activity could explain the reduction in available capacity but this is not transparent if delays are simply attributed to ATC capacity. (If the causes of capacity constraints are not properly identified they cannot be resolved).

Since it is a collapsed sector, opening the constituent parts would provide additional capacity to airspace users.

There has been no increase in the declared capacity for sector LCCCS1 in the last four years, despite significant capacity attributed delays, resulting in additional costs to airspace users of approximately €3.2 million in 2014; €2.2 million in 2015; €1.6 million in 2016 and €5.6 million in 2017.

Based on 2017 traffic, increasing the declared capacity of the LCCCS1 sector from 28 to 40 would have reduced the number of hours when traffic demand surpassed declared capacity from 1502 to 81, a reduction of 95%.

PRC questions (See Section 3.2.2 for ANSP response)

A reduction in regulated capacity (from the declared capacity), up to 7%, is observed for the entire period of regulation, but the reason for the regulation was still attributed to ATC capacity, giving the impression that full capacity was being deployed. No obvious additional factor (such as military operations and training or adverse weather) is identified as preventing the deployment of the full declared sector capacity.

Regulating traffic at capacity levels below the published declared capacity (without providing an explanation) highlights latent capacity that could be provided to airspace users at no cost to the ANSP.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to "to accurately identify specific capacity constraints that adversely impact the service provided to airspace users" & "ensure an accurate and consistent classification of ATFM delays to enable constraints on European ATM to be correctly identified and resolved or mitigated"

The original capacity constraint in the Nicosia FIR was due to the decision to open a collapsed sector LCCCS1 instead of opening two separate sectors. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to "provide capacity to meet demand instead of regulating demand to meet reduced capacity" & "to ensure that capacity is made available during peak demand."

Q3: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

The LCCCS1 sector has been a capacity bottleneck for several years. Although peak traffic demand in that portion of the Mediterranean is moderate (99th percentile demand peaks =40 aircraft per hour) at times (17%) the hourly demand is greater than the declared capacity of the collapsed sector LCCCS1 (28).

Regulating sector LCCCS1 at the reduced capacity of 26 increases the number of hours where demand is greater than capacity by more to 22%.

Increasing the declared capacity of the LCCCS1 sector to 40 would have reduced the number of hours where demand exceeded capacity by 95% in 2017.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q4: What specific plans are in place to increase both current and future capacity in the LCCCS1 sector to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.2.2.

2.12 Maastricht UAC Brussels Sectors: Brussels OLNO sector

4355 minutes of delay attributed to ATC capacity on Saturday 01/07/2017 from 07:40 to 16:30.

Year	ATFM delay attributed to ATC capacity	Total ATFM delay
2017	151,589	222,306
2016	109,434	192,411
2015	67,992	76,082
2014	15,193	27,058

Table 24: Annual ATFM delays attributed to Brussels OLNO sector

Sector infrastructure and capacities: The Brussels OLNO Sector (FL245-UNL) is located primarily over the east of Belgium, but also parts of the Netherlands and Germany. It is a collapsed sector comprised of the Brussels OLNO low sector (FL245-FL335) and the Brussels OLNO high sector (FL335-UNL).

The Brussels OLNO sector has different capacity characteristics depending on the opening or closing of the individual constituent parts. In addition, as showed previously, the constituent parts of the Brussels OLNO sector can also be opened together with elements of the Brussels LUX sector to provide still more options for capacity deployment.

Figure 26: Brussels OLNO sector

The declared capacity of the collapsed Brussels OLNO sector is 75, whereas opening both OLNO low and OLNO high offers a potential declared capacity of up to 108 aircraft per hour.

Brussels OLNO sector (75)	UNL FL245	OLNO HIGH (53)	UNL FL335	OLNO High can be split into OLNO Upper & OLNO Middle but no declared capacities are provided.
		OLNO LOW (55)	FL335 FL245	

Table 25: Options for declared capacity in OLNO sector

Civil Military airspace structures**:** The Brussels OLNO sector contains a significant military training and operations area TRA/TSA NB complex and in particular parts of TSA/TRA N1 & N3 which extend from UNL to FL195. The relevant areas are shown in blue, in contrast to the yellow line in the map, which roughly shows the lateral limits of the OLNO sector. Reservation or activation of these areas results in constraints to both available route options and the available capacity for general air traffic.

In 2017, 869 minutes of ATFM delay were attributed to military operations and training in the Brussels OLNO sector.

On 1st July 2017 the airspace use plan for Belgium showed no reservation of TSA/TRA NB complex.

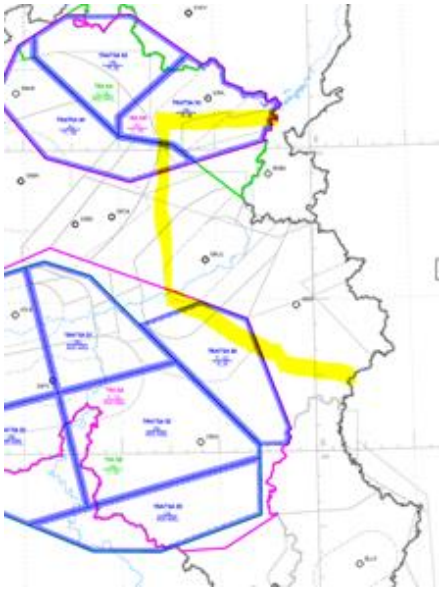
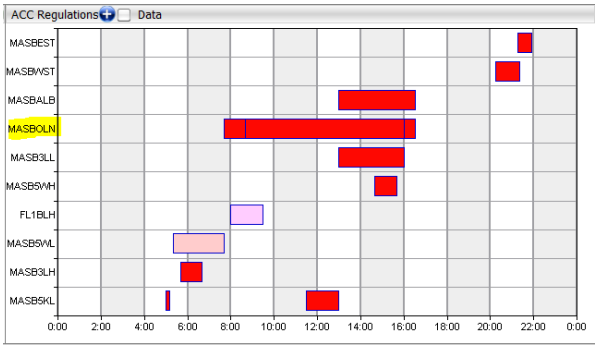


Figure 27: Military areas in Brussels OLNO sector

Meteorological conditions on the day of operations: No adverse weather phenomena were forecasted or reported for the Brussels UIR or portions of the Amsterdam FIR or Hannover UIR within the Brussels OLNO sector.

Evolution of Capacity constraints and ATFM regulations on Day of Operations for Brussels OLNO sector MASBOLN:

It is evident that the regulated capacity (75) was equal to the declared capacity (75) for the first hour of the regulation (07:40 to 08:40). For the next seven hours and twenty minutes, the regulated capacity (80) was greater than the normal declared capacity. In the final thirty minutes of the regulation the regulated capacity was further increased to 84 aircraft per hour (12% greater than the normal declared capacity).



ACC Regulations	Data		
ID	YBOLN01M	YBOLN01M	YBOLN01M
TV	MASBOLN	MASBOLN	MASBOLN
RefLoc	EDYYBOLN	EDYYBOLN	EDYYBOLN
StartsDayBefore	No	No	No
Open	07:40	08:40	16:00
Close	08:40	16:00	16:32
Capacity	75	80	84
Reason	ATC CAPACITY	ATC CAPACITY	ATC CAPACITY

Figure 28: Brussels OLNO sector – regulations on 01 July 2017

Summary

- Traffic demand was above the regulated capacity in the Brussels OLNO sector. The regulated capacity was generally higher than the normal declared capacity.
- Traffic demand was, at times, above the normal available capacity in the Brussels OLNO sector.
- Adverse weather did not constrain the available capacity in the Brussels OLNO sector.
- Military activity and bookings did not constrain the available capacity in the Brussels OLNO sector.
- Operation of the collapsed Brussels OLNO sector constrained capacity that could have been available if the OLNO low & OLNO High sectors were opened separately. This is valid even considering the fact that the regulated capacity was greater than the declared capacity of the collapsed sector – 84 compared with up to 108 aircraft per hour.

Conclusions

Traffic demand in that portion of Belgian airspace can be very high (+110) and at times exceeds the declared capacity of the ATC sectors. This indicates that, despite already handling very high throughput, MUAC and the national authorities need to continue to add capacity to meet the needs of the airspace users.

The Brussels OLNO sector (declared capacity 75) is itself a collapsed sector: MUAC was already constraining available capacity by not opening the constituent sectors separately, OLNO Low & OLNO High (capacity up to 108).

The efforts of the ATC staff in trying to improve the situation for airspace users by providing more than the declared capacity must be recognised. The PRC notes that the Brussels OLNO

sector was able to deploy a capacity of 80, 5 above the official declared capacity, for almost 8 hours.

In the opinion of the PRC, the failure to open the required number of sectors to meet traffic demand is either due to the failure or unavailability of technical equipment or due to the unavailability of adequately qualified ATC staff. In case of the former, the capacity constraint, and resulting delays, should be attributed to ATC equipment and in the latter case it should be attributed to ATC staffing.

Despite handling very high traffic levels, there have been significant Capacity attributed delays in the collapsed OLNO sector over the last few years. Operation of the collapsed sector has resulted in additional costs to airspace users of approximately: €1.5 million in 2014; €6.8 million in 2015; €10.9 million in 2016 and €15.2 million in 2017.

In 2017, there were 1957 hours where traffic demand through the volume of the Brussels OLNO sector exceeded the declared capacity of 75 aircraft per hour (22% of the time); 1330 hours where traffic demand exceeded 80 aircraft per hour (15% of the time) and 879 hours where demand exceeded 84 aircraft per hour (10% of the time). It is clear that operation of the Brussels OLNO as a collapsed sector is insufficient to meet the required capacity demands.

PRC questions (See Section 3.1.4 for ANSP response)

The impressive efforts of the ATC staff in trying to improve the situation for airspace users by providing more than the declared capacity must be recognised. The PRC notes that the Brussels OLNO sector was able to deploy a capacity of 80, 5 above the official declared capacity, for almost 8 hours.

Regulating traffic at levels above declared capacity indicates a latent capacity that could be provided to airspace users at no cost to the ANSP.

A previous PRC recommendation, adopted by the Provisional Council and Permanent Commission, requested States “to review sector capacities, both with and without airspace restrictions, to increase network performance.”

Q1: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

The original capacity constraint was due to the decision to open a collapsed sector Brussels OLNO instead of opening the two constituent sectors OLNO High and OLNO Low, according to traffic demand. Most probably this was due to the unavailability of suitably qualified ATC staff, or unserviceable ATC equipment preventing the opening of an additional sector – with the former being more likely.

Previous PRC recommendations, adopted by the Provisional Council and Permanent Commission, requested States to “provide capacity to meet demand instead of regulating demand to meet reduced capacity” & “to ensure that capacity is made available during peak demand.”

Q2: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

The MUAC Brussels OLNO sector has been a capacity bottleneck for several years with a very high traffic demand (>110). Permanent restrictions on vertical profiles prevent traffic to and from certain airports from entering the airspace underlining that the traffic demand is even higher than what is recorded. This clearly demonstrates that MUAC and the Belgian authorities

should be striving to ensure that as much capacity as possible is made available to airspace users in this portion of airspace. All efforts should be made into examining possibilities of adding additional capacity (more sectors or airspace reorganisation and by minimising constraints associated with airspace management, especially during periods of peak traffic demand.

Previous PRC recommendations, adopted by the Provisional Council and the Permanent Commission, requested States to "develop and implement capacity plans which are at minimum, in line with reference capacity profile…"; "taking due consideration of forecasted traffic demand; ensure capacity plans are implemented as promised…" & "… to implement a forward looking and proactive approach to capacity planning, in order to close existing capacity gaps and to accommodate future traffic growth."

Q3: What specific plans are in place to increase both current and future capacity in the Brussels OLNO and or OLNO High and OLNO Low sectors to cope with the traffic demand?

➔ The corresponding responses provided by the ANSP can be found in Section 3.1.4.

3 Responses from Air Navigation Service Providers

3.1 EUROCONTROL Maastricht UAC

Maastricht UAC (MUAC) expressed disappointment that the investigation was conducted without the involvement of MUAC personnel. It also contested several of the assumptions and arguments made in the report (and in the Performance Review Report 2017). Analysis of the most penalising ATC capacity attributed ATFM regulation, in particular on 22nd June 2017 does not, in the opinion of MUAC, represent the excellent day-to-day performance of MUAC. MUAC consider that an assessment at the level of individual ANSP capacity and delay performance under such circumstances is inappropriate and misleading.

"In [MUACs] view, the suggestions for improvement in the report are both over-simplified and suggest that none of the listed measures are in place.

Where 'performance' is measured solely by delay in the RP2 context, high traffic demand and airspace saturation are at the core of MUAC's performance challenge. However, this one-sided perspective is not representative of the real operational performance of MUAC. Even within the regulatory framework of the document, additional areas reflecting best-in-class operational performance like ATCO productivity, sector productivity and safety need to be added"

In summary, MUAC does not agree with the report.

3.1.1 Brussels East High FL335+

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: The use of regulation reason 'ATC-Staffing' is only applied in those cases where opening an additional sector would have been an option and would have mitigated the problem. If this is not the case, the regulation reason is 'ATC-Capacity' (assuming there are no other events such as weather, strike, etc.).

However, as only one reason can be given for an individual ATFM regulation, the main or original delay cause may obscure other reasons for the regulation.

Q2: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

A: This question seems to be mostly driven by the wrong conclusion that delay was caused by unavailability of staff, and that this was not correctly reflected in the delay reason. As explained before, this was not the case. Also, MUAC has nothing to gain from hiding staffing unavailability as a cause for delay. On the contrary: it would strengthen the case that we have been making for the need to hire additional staff!

Staff planning for any given day is the result of a very sophisticated process that actually starts on D-364 and is continually refined until D-1. There are several arrangements in place to ensure flexibility in planning even up to D-1. This has resulted in an overall shift planning efficiency of 93%, which is unparalleled.

Q3: What specific plans are in place to increase both current and future capacity in the Brussels East High sector, and or the Brussels Lux and Brussels Olno sectors?

A: As also communicated in the Network Operations Plan for 2018-2022, MUAC is undertaking several initiatives:

- airspace study for the Brussels sector group; if found feasible and beneficial to the network, the actual implementation should take place as from 2019
- FRA (Free Route Airspace) during night and weekend is planned for implementation in Dec 2018
- FRA H24 is planned for implementation in 2020
- Dynamic FUA above FL365 is planned for 2019
- The new conceptual role of Advanced ATC Planning Function (AAPF) is being trialled in 2018
- MUAC continues to work with the Network Manager on advanced B2B implementations
- a separate Capacity Unit at MUAC will focus on ATFCM improvements, This will be supported by advanced post OPS and business intelligence.
- Increased usage of CPDLC by AOs is expected to give additional capacity increase

3.1.2 Delta West Low FL245-FL355

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: The use of regulation reason 'ATC-Staffing' is only applied in those cases where opening an additional sector would have been an option and would have mitigated the problem. If this is not the case, the regulation reason is 'ATC-Capacity' (assuming there are no other events such as weather, strike, etc.).

It may be that during the course of the day, a regulation rate is adapted due to weather and/or military activity. However, as only one reason can be given for an individual ATFM regulation, the main or original delay cause may obscure other reasons for the regulation.

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

A: Sector capacities are reviewed monthly by the Focus Area Capacity, which consists of a group of Supervisors, FMP staff and ATCOs. This review compares declared occupancy values against the statistics of the really 'worked' occupancy, looks at reports from ATCOs, and assesses the so-called Military Grid that contains a very detailed impact rating of all military areas and combinations thereof.

Q3: What specific plans are in place to increase both current and future capacity in the Delta West Low sector to cope with the traffic demand?

A: As also communicated in the Network Operations Plan for 2018-2022, MUAC is undertaking several initiatives:

- Implementation of the DECO Airspace Reorganisation Project (DARP) took place in March 2018, introducing a 3rd layer for DECO (from 335 to 365)
- FRA (Free Route Airspace) during night and weekend is planned for implementation in Dec 2018

- FRA H24 is planned for implementation in 2020
- Dynamic FUA above FL365 is planned for 2019
- The new conceptual role of Advanced ATC Planning Function (AAPF) is being trialled in 2018
- MUAC continues to work with the Network Manager on advanced B2B implementations
- a separate Capacity Unit at MUAC will focus on ATFCM improvements, This will be supported by advanced post OPS and business intelligence.
- Increased usage of CPDLC by AOs is expected to give additional capacity increase

3.1.3 Delta West High FL355+

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: The use of regulation reason 'ATC-Staffing' is only applied in those cases where opening an additional sector would have been an option and would have mitigated the problem. If this is not the case, the regulation reason is 'ATC-Capacity' (assuming there are no other events such as weather, strike, etc.).
It may be that during the course of the day, a regulation rate is adapted due to weather and/or military activity. However, as only one reason can be given for an individual ATFM regulation, the main or original delay cause may obscure other reasons for the regulation.

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

A: Sector capacities are reviewed monthly by the Focus Area Capacity, which consists of a group of Supervisors, FMP staff and ATCOs. This review compares declared occupancy values against the statistics of the really 'worked' occupancy, looks at reports from ATCOs, and assesses the so-called Military Grid that contains a very detailed impact rating of all military areas and combinations thereof.

Q3: What specific plans are in place to increase both current and future capacity in the Delta West High sector to cope with the traffic demand?

A: As also communicated in the Network Operations Plan for 2018-2022, MUAC is undertaking several initiatives:
- implementation of the DECO Airspace Reorganisation Project (DARP) took place in March 2018, introducing a 3rd layer for DECO (from 335 to 365)
- FRA (Free Route Airspace) during night and weekend is planned for implementation in Dec 2018
- FRA H24 is planned for implementation in 2020
- Dynamic FUA above FL365 is planned for 2019
- The new conceptual role of Advanced ATC Planning Function (AAPF) is being trialled in 2018
- MUAC continues to work with the Network Manager on advanced B2B implementations
- a separate Capacity Unit at MUAC will focus on ATFCM improvements, This will be supported by advanced post OPS and business intelligence.
- Increased usage of CPDLC by AOs is expected to give additional capacity increase

3.1.4 Brussels OLNO sector

Q1: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

A: Sector capacities are reviewed monthly by the Focus Area Capacity, which consists of a group of Supervisors, FMP staff and ATCOs. This review compares declared occupancy values against the statistics of the really 'worked' occupancy, looks at reports from ATCOs, and assesses the so-called Military Grid that contains a very detailed impact rating of all military areas and combinations thereof.

Q2: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

A: This question seems to be mostly driven by the wrong conclusion that delay was caused by unavailability of staff, and that this was not correctly reflected in the delay reason. As explained before, this was not the case. Also, MUAC has nothing to gain from hiding staffing unavailability as a cause for delay. On the contrary: it would strengthen the case that we have been making for the need to hire additional staff!

Staff planning for any given day is the result of a very sophisticated process that actually starts on D-364 and is continually refined until D-1. There are several arrangements in place to ensure flexibility in planning even up to D-1. This has resulted in an overall shift planning efficiency of 93%, which is unparalleled.

Q3: What specific plans are in place to increase both current and future capacity in the Brussels East High sector, and or the Brussels Lux and Brussels Olno sectors?

A: As also communicated in the Network Operations Plan for 2018-2022, MUAC is undertaking several initiatives:

- airspace study for the Brussels sector group; if found feasible and beneficial to the network, the actual implementation should take place as from 2019
- FRA (Free Route Airspace) during night and weekend is planned for implementation in Dec 2018
- FRA H24 is planned for implementation in 2020
- Dynamic FUA above FL365 is planned for 2019
- The new conceptual role of Advanced ATC Planning Function (AAPF) is being trialled in 2018
- MUAC continues to work with the Network Manager on advanced B2B implementations
- a separate Capacity Unit at MUAC will focus on ATFCM improvements, This will be supported by advanced post OPS and business intelligence.
- Increased usage of CPDLC by AOs is expected to give additional capacity increase

3.2 DEPARTMENT OF CIVIL AVIATION Nicosia ACC

3.2.1 NICOSIA LCCCES0 GND – UNL

Q1: What processes are in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: The process of imposing a regulation in Nicosia ACC is as follows:

The FMP controller decides based on the sector counts, the occupancy and the prevailing conditions, whether a regulation shall be imposed. The validity of the regulations can always be confirmed with actual CPR data received by NM wrt the traffic load.

The case study presented is relevant to a Sector where the SES and ICAO principles are not applied with regards to ATM coordination and transfer of control. LCCCES0 is at the interface of Nicosia and Ankara FIRs and suffers from the refusal of Turkey to cooperate with the Republic of Cyprus in the coordination of flights between the two neighbouring FIRs and in addition the interventions of the illegal station “ercan” create many safety risks in the area (ref. EASA ATM study).

On top of the above, the sector includes due to size limitations the approaches of LCLK (Larnaca airport) and OLBA (Beirut airport).

It includes many military operations that are not subject to airspace reservations. Mainly this consists of foreign military aircraft operating “due regard” over ‘High Seas’ controlled airspace.

The chart indicated in the study does not include the military activities happening outside the AUP. USS aircraft carrier was operating in the area from 1/6/2017 – 31/7/2017.

Traffic flows in the sector have become very complex due to the reshuffling of the flows after the Syrian crisis, leading to a reduction in capacity.

According to NM 27% of entering traffic is received from unregulated areas.

According to the same study there has been an increase in slot violations from neighbouring airports leading to excessive traffic counts.

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

A: The declared capacities are based on empirical experience and traffic complexity. Traffic capacity in the sector is impaired by the safety risks present due to lack of effective ATM in the area (ref ATM study). The best service to airspace users is a safe service. The sector capacity will be re-evaluated in future capan study and in addition when progress has been made with uncoordinated military operations as well as with the transfer of control and coordination of traffic at the interface with Ankara FIR.

Q3: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

A: The issue is being tackled effectively with continuous recruiting of ATCOs for the ACC. Weekend/holiday staff shortage issues affecting rostering are prevalent in all European ACCs. The DCA participates in relevant forums in order to develop remedial actions.

Q4: What specific plans are in place to increase both current and future capacity in the LCCCES0 sector, and or in both the LCCCE1 and LCCCE2 sectors to cope with the traffic demand?

A: The increase in capacity in the current sector is currently not feasible because of the prevailing safety conditions due to the operation of “ercan” and the lack of coordination between Nicosia and Ankara ACC. Nicosia ACC is planning to operate a vertically split LCCCCES0 sector as a way to provide more capacity. More capacity could be provided by a redesign of the Nicosia / Ankara interface and the introduction of segregated traffic flows. As an example the availability for flight planning of the point DOREN would significantly increase sector capacity.

LCCCE2 sector CAN NOT operate as an individual sector. It’s a small piece of airspace combined either with LCCCS1 or LCCCE1 as a tool for offloading the LCCCS1 sector. When LCCCE2 is combined with LCCCE1, LLBG northerly departures are excluded from traffic counts in order to maximise the throughput of the busy LCCCS1 sector. It has to be noted though that LCCCE2 is often blocked by military operations in LCD46 thus the opening of the sector as a standalone would not offer any additional capacity. The usage of LCD46 in the area affects negatively the area capacity since the northerly/southerly flows into and out of LLBG is hampered. Under normal conditions, e.g. no other military operation in the area, delays were very rarely recorded when the route that crosses within LCD 46, MERVA-DESPO was available.

3.2.2 NICOSIA LCCCES1 sector

Q1: What specific plans are in place to increase both current and future capacity in the LCCCES1 sector to cope with the traffic demand?

A: LCCCES1 sector (opinion supported by NM) is one of the most complex sectors because it encompasses many flows in and out of neighbouring airports. The sector flows became very complex since the beginning of the Syrian crisis where all traffic into/out Beirut are entering the sector avoiding the Syrian airspace. These added flows are crossing on the descent/climb phase the climbing/descending traffic into Ben-Gurion airport. The traffic increase experienced by LLBG airport and the added flows into OLBA have converted the sector into an approach sector and not an enroute traffic sector. A valid proposal is to exclude traffic delays of this sector from enroute delays.

Nicosia ACC is cooperating with NM is redesigning proposals for maximizing the throughput of the sector taking into account the increasing military needs in the area.

LCD 46 hampers seriously the effectiveness of the sector.

3.3 ENAIRE Canarias ACC

3.3.1 Canarias ACC Norte Este sector GCCCRNE

ENAIRE commented on the fact the whilst meteorological conditions did not impact the available capacity the prevailing winds aloft, on both these days, had a significant influence on the selection of routes by the aircraft operators and thus led to over-demand on certain routes.

Q1: What specific plans are in place to increase both current and future capacity in the GCCCRNE sector to cope with the traffic demand?

A: Current mitigation measures

At present, we are trying to reduce the RNE sector overflights on the basis of the use of scenarios that allow rerouting the traffic in a balanced way.

As the information provided by PREDICT is sometimes incomplete (weather information is not considered), scenarios implementation in the pre-tactic phase is complicated and, on many occasions, when they are activated in a tactical phase, the effect is not as effective as would be desirable. In addition, when there are high-intensity winds in Canarias Upper airspace, the implementation of some scenarios may be inadequate because they impair the operation to the AOs [aircraft operators].

For the last few weeks, a collaboration plan has been carried out with the company Thomas Cook and with NM, so that on Friday mornings the company provides its route plan for the weekend to/from the Canary Islands and England and Central Europe. These routes are analysed by the NM that issues a report in order to facilitate the adoption of pre-tactical measures in the Canary Islands.

Future Proposal

The future of this Sector requires its splitting into a higher sector and a lower one, which will allow managing the flows that cross it in a differentiated way. The project is already launched and the conditioning factor for its implementation is the definition of a new sector in the Canarias ACC, with the consequent need for an increase of staff. The initial term foreseen for the implementation of this Sector split is 01/01/2020.

3.4 DSNA – Marseille ACC & Paris ACC

3.4.1 Marseille ACC

Q1: What policy or process is in place to ensure that airspace users are not penalised because of the unavailability of suitably qualified ATC staff?

Q2: What specific plans are in place to increase both current and future capacity in the Marseille ACC sector to cope with the traffic demand?

A: [DSNA] confirms the analysis concerning the cause of the traffic restrictions: this was due to staff shortage. For better clarity, [DSNA] has instructed staff in all French ACCs to use "S" cause [ATC staffing] for similar cases in 2018.

In order to penalise airspace users as little as possible because of the unavailability of suitably qualified ATC staff, several actions have been launched. A long term one is the recruitment of ATCOs in line with the traffic increase. As medium term action, as experienced during the past few months, a new local agreement is in place at Marseille ACC in order to realise more capacitive rostering. Nevertheless, this agreement is less ambitious than what was implemented in 2017 in Reims, Brest and Bordeaux due to sever social opposition. For the short term, [DSNA] is trying to coordinate with NM EUROCONTROL a cross border ACC initiative similar to this year 4 ACC initiative.

3.4.2 Paris ACC East Sectors: LFFFLMH sector (LFFPU + LFFTU + LFFHP + LFFUT + LFFUP)

Q1: What process is in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: The event … happened during a particularly loaded ski week-end during winter 2016-2017. For this day, a first traffic restriction was put in place on MH sector with a rate at 40, which is the declared capacity during ski season. A second traffic restriction has also been put on UP sector with a rate between 24 and 29, when the recommended rate during ski season is 24.

Q2: What plans or processes are in place to review the declared sector capacities to ensure that the airspace users are receiving the best possible service?

A: In order to improve ski days situation, a new airspace project, named SMARTSKI, was put in place in autumn 2017. This led to a decrease by 52% of Paris ACC delays during last ski season. In addition, negotiations have been launched in Paris ACC to try to implement a flexible rostering.

3.5 DFS Deutsche Flugsicherung – Karlsruhe UAC

DFS suggested that although analysis of the most penalising regulations might provide interesting findings, more benefits might be generated from analysing sectors generating the highest ATFM delays over the whole year, which might not necessarily be the same sectors.

DFS indicated its disagreement with the PRC finding that ANSPs are operating collapsed sectors during periods of high demand instead of providing all available capacity to airspace users. DFS provided statements relating to (medium and long term) traffic forecasts and additional capacity planning whereas the PRC finding relates to deployment of existing capacity.

3.5.1 Karlsruhe UAC West sector group: Soellingen sector low (EDUUSLN13) FL245 to FL355

DFS provided further information on the regulation process during the period of analysis. “A first regulation at the level of 49 entries per hour almost capped the traffic at the desired level, but would have led to bunching right after the regulation. The extension of the regulation helped to reduce the abovementioned bunching. However, as on load was regularly experienced due to unanticipated traffic and over delivery, the regulation had to be turned down to a level of 45 entries per hour.”

Q1: What process is in place to ensure that the reasons for individual ATFM regulations are fully transparent and consistent with the operational situation that required regulations to be imposed?

A: ATFM regulations at DFS strictly follow the requirements of the “ATFM Operations Manual”. The regulation reasons are therefore in line with the “Guidelines for Application” published in chapter 6.6.1.2 of the document.

FABEC NSAs have defined a “Post Ops Validation Process for non-ATC-related ATFM Regulations”, which is described in the FABEC Performance Plan RP2.