NUAC Programme
Definition Phase Final Report

Appendix 7

Airspace Design

OCTOBER 2006

Third Draft

Table of Contents

1 Introduction

The overall aim of the NUAC Programme definition phase is to analyse means to make best use of available resources to reduce costs with sufficient safety and capacity. As part of the definition phase of the NUAC Programme, meeting the purpose of elaborating an efficient airspace solution with regards to staffing, traffic demands etc, the following report is intended as aid to the development of a consolidated Business Case for 3 different scenarios described below. The findings of the report are of a quality high enough to be guidance for a robust development of a detailed solution of the chosen scenario.

The study is a high level study of the possible layout of Danish and Swedish airspace, including aspects of use of the three Control Centres in Stockholm, Malmö and Copenhagen. Division flight levels, maps, number of sectors and sector layout shall adhere to the intentions, requirements and regulations of the Single European Sky initiative, ensuring that the future airspace layout meets future specifications. See chapter 1.1 and chapter 12 for details.

The three scenarios described in the document “Terms of Reference for the NUAC Programme, definition phase” are included in the study. See chapter 2 for details.

The areas described in this document are intended only for aid in the process of building a business case for an eventual NUAC programme solution, and not as areas for operational use, which however, in the opinion of the Airspace Design Group, would be a possibility after validation by simulation etc. The areas are based on the number of areas or sectors in 2006 in the lateral size and on horizontal limits from the same time adjusted for the three scenarios described in the Terms of reference for the project and as an adjustable enabler for levelling capacity flaws between the three centres.

The case description of the approximately 40, 40 and 60 positions in respectively Stockholm, Malmö and Copenhagen and existing approach positions outside these three premises, is derived from the layout of the two existing centres in Sweden and the coming DATMAS centre in Denmark. The study has not been made to describe any change or move of positions from one centre to another or indeed manning from one country to another. Issues like those will be for later stage investigation and consideration.

1.1 General grounds and Premises

The study is made on the premises of national and international legislation and regulation and does not change or adhere from any defined rule of obligation of commitment already imposed on the Service Provision of LFV and Naviair.

The study has been made with reference to the documents listed in chapter 12 and the necessary expertise have been allocated to the workgroup in order to secure adherence to and compliance with existing legislation, standards and recommended practices such as ICAO Doc 4444 and Annexes, ICAO Standards and Recommended Practices (SARP’s).

EUROCONTROL documentation of consistency between ESARR’s and ICAO Standards and Recommended Practices (ICAO SARP’s) has been studied as it is found relevant for the Airspace Design Workgroups grounds and premises that all

Airspace Design work has to be compliant with international regulation. It is found; that ESARR's in some cases expand upon ICAO SARP's, but never lessens them.

With regards to European Commission Regulations, Single European Sky initiatives and regulatory environment, this document complies with following documents and EC mandates to EUROCONTROL:

EUROCONTROL Final Report on European Commission's Mandate: Draft Implementing Rules on Flexible Use of Airspace:

- Airspace classification
- Airspace design without constraints between upper and lower airspace
- Military aspects taken into consideration, without integration
- No negative impact on environmental issues

EUROCONTROL Final Report on European Commission's Mandate to Support The Establishment of Functional Airspace Blocks (FAB's):

- Airspace design without regards to national boundaries
- Optimised route structure for safe traffic flow
- Sectorisation relying on safe and efficient sector capacity
- The possibility of common airspace management
- The possibility of common Flow Management
- The possibility of effective use of human resources and equipment

1.2 Flight Information Region

The airspace described in the three scenarios in this document can all be integrated in one Flight Information Region, with one common call sign and one unit rate. This will comply and easily integrate with the EC mandate to EUROCONTROL concerning one single European Upper Information Region.

In the event of additional service provider entities joining the common airspace, consideration whether one Flight Information Region is suitable will have to be made for each case scenario.

1.3 Adjustable enabler for levelling capacity flaws

In the build of Business Cases and Cost Benefit Analyses the findings in this report will enable elaboration on the requirement of optimised use of the three centres in Stockholm, Malmö and Copenhagen. Additionally function as an adjustable enabler for levelling capacity flaws. This means that the reference to Malmö Centre as the En Route Centre and Copenhagen and Stockholm as TRACONS[1] as given in the Terms of Reference for the project has been considered with regards to the actual approximately 140+ positions in the three centres. I.e. An en route position can be situated in a TRACON if this gives the most optimal use of position.

The use of the TRACONS as a combined Approach Control and a Feeder/Stacker ATC system will further enable the consideration above. Thus the summarized figures in chapter 9 have been counted collectively and can be adjusted over the three centres as appropriate

[1] Terminal Radar Approach CONtrol, utilising both Radar Approach Control functions, Feeder/Stacker positions and even, in case of preference, some en-route sectors

1.4 Contingency

The three centres will have the ability to function as mutual contingency partners in case of emergencies.

2 Description of Scenarios Merger, NUAC/Skaane and Alliance

2.1 Merger Scenario

A full merger of the Danish/Swedish airspace and the following optimum use of the three Control Centres. ATCC Stockholm and ACC Copenhagen shall be transformed into TRACONS with responsibility for Terminal and Approach Control for several aerodromes and ATCC Malmö as ACC for en-route traffic outside Stockholm/Copenhagen TRACON and other local approach units. An additional study based on the optimal use of available positions in the three Control Centres – approximately 40 positions in Stockholm, 40 positions Malmö and 60 positions in Copenhagen will be carried out and existing approach positions outside these three premises is listed in this report.

2.2 NUAC/Skaane Scenario:

The original NUAC/Skaane project as described in the NUAC Phase 1 Report and in the Skaane Project Feasibility Phase Final Report January 2004 and connected documents, as described in chapter 12 in this document.

2.3 Alliance Scenario:

Alliance Scenario is a virtual possibility including the use of the three above-mentioned Control Centres and the airspace, with a joint data distribution/sharing et al.

3 Operator roles

The operator roles necessary to execute operations are the same as found in present/coming Swedish and Danish centres.

These roles are:

- Operational watch supervisor (SUP)
- Tactical Supervisor (TAC SUP)
- Technical watch supervisor (TECH SUP)
- Executive controller (EXE)
- Planning controller (PLN)
- Flight Data Operator (FDO)
- FMP Operator (FMP)
- Co-ordinator (COOR)
- Copenhagen Information (COIF)

These operator roles could also include national military liaison officers where and when found feasible.

Operational watch supervisor

Following are an estimate of the responsibilities laid upon the Operational Watch Supervisor on duty:

- Be responsible for the over-all operational work performed in the centre.
- Monitor and safeguard those parts of the technical system that can be maintained from the SUP position.
- Conduct briefing and debriefing with the operational staff.
- Be responsible for the correct manning of each shift in the centre.
- Flow Management duties.

Tactical Supervisor

Following are an estimate of the responsibilities laid upon the Tactical Supervisor on duty:

- Conduct briefing and debriefing with the operational staff.
- Be responsible for opening and closing of positions.
- Be responsible for correct manning.
- Assess the need for traffic regulation.

Technical watch supervisor

Following are an estimate of the responsibilities laid on the Technical Watch Supervisor on duty:

- Monitor and safeguard those parts of the technical system that can be maintained from the TECH SUP position.
- Identification and reporting of technical problems.

- Perform necessary re-start, re-configurations and adjustments of technical equipment.
- Perform limited replacement of hardware
- Provide advice and necessary liaison with the SUP and Level 2 competences.

Executive controller

The responsibilities for the executive controller are dependent on the capabilities of the system and the Human Machine Interface. For the time being these responsibilities are foreseen to comprise:

- Separate aircraft within the sector
- Perform radio communications with aircraft
- Initiate changes to exit conditions
- Assume responsibility for incoming traffic to the sector
- Monitor traffic and exchange of co-ordination. Where required initiate actions.
- Reads relevant SIGMET information

Planning controller

As for the executive controller, also the planning controller is dependent on the capabilities of the system and the Human Machine Interface. For the time being the responsibilities are foreseen to comprise:

- Discover “ENTRY” conflicts and resolve these where appropriate
- Mark un-resolved “ENTRY” conflicts for the Executive Controllers initiative
- Plan “EXIT” conditions
- Monitor Message IN/OUT windows and respond where necessary
- Perform necessary verbal co-ordination
- Perform telephone communication
- Co-ordinate with Air Defence units
- Execute task assigned by the executive controller

Flight Data Operator

The following responsibilities are foreseen to be handled by the Flight Data Operator:

- Normal Flight Data Operator’s duties carried out from a FDO position.
- Administrative and operational duties for the SUP.
- Flight Plan Updates/Corrections to support the operational ATM system.
- Administrations of sub-systems.

FMP Operator

Following are an estimate of the responsibilities to be handled by the FMP Operator:

- Responsible for all ATFM activities in the ACC

Co-ordinator

Following are an estimate of the responsibilities laid upon the Co-ordinator on duty:

- Assist SUP in operational issues.

Copenhagen Information

The responsibilities for Copenhagen Information are foreseen to comprise:

- Monitor traffic and exchange of co-ordination. Where required initiate actions.
- Provide air traffic service to VFR traffic.
- Handling of helicopter offshore traffic in the North Sea.

4 LFV and NAVIAIR airspace classification

4.1 General

For the sake of comparison with present day (2006) a short description of airspace classification is found below.

4.2 Airspace classification

Airspace classification in Copenhagen and Sweden FIR are as follows:

From/To	Copenhagen FIR	Sweden FIR
FL 460 and above	G	G
FL 460/FL 195	C	C
FL 195/FL 95	E, G	C
FL 95/3500 ft	E, G***	G*
3500 ft/ GND	G	G
TMA	C, D	C
CTR	D	C
TIZ/TIA	G**	G**

* *Flight plan and two-way radio communication is compulsory above 5000 ft/3000 ft GND whichever is higher, for VFR flight in darkness and for IFR flight.*

** *Within TIZ/TIA, two-way radio communication with ATS is required.*

*** *Flight plan and two-way radio communication is compulsory for VFR flight in darkness and for IFR flight.*

Harmonisation of the current airspace classification has to take place to use the airspace in an efficient and a safe way that complies with SES initiative regarding airspace harmonising. However this will not influence the number of sectors or positions described.

The framework in Europe is to harmonise airspace classification, class C, as low as possibly. Upper limit of terminal area should be harmonised with the controlled airspace.

For the uncontrolled airspace classification class G is to prefer.

The described airspace in Alliance Scenario is identical to existing airspace, and because Swedish and Danish airspace are not yet harmonised, this does not comply with SES initiative regarding airspace harmonising.

5 Local Approach units

Below is a schematic summary of positions in local ATS-units in Denmark and Sweden as guidance material.

These positions have not been included in the calculated number of positions for Merger Scenario, but in the longer term perspective these positions could be considered in some way incorporated in the 3 centres.

5.1 Denmark

ATS-unit	APP
EKYT	1
EKBI	3
EKAH	1
EKRK	2
Total	7

5.2 Sweden

ATS-unit	APP
ESPA	2
ESOW	1
ÖKC TMC	3
ESSV	1
ESDF	2
ESIB	2
ESGG	2
Total	13

6 Merger Scenario

6.1 General

Merger Scenario for NUAC Business case is a full merger of the Danish/Swedish airspace and the following use of the three Control Centres. ATCC Stockholm and ACC Copenhagen shall be transformed into TRACONS with responsibility for Terminal and Approach Control for several aerodromes and ATCC Malmö as ACC for en-route traffic outside Stockholm/Copenhagen TRACON and other local approach units. An additional study based on the optimal use of available positions in the three Control Centres – approximately 40 positions in Stockholm, 40 positions Malmö and 60 positions in Copenhagen and existing approach positions outside these three premises and thus no reference to specific centres for the sectors in Merger Scenario has been given as described in chapter 1.3 above.

The described airspace has not been simulated, but there are similarities to what previous have been found viable in the Skaane project and the NUAC project simulations (see NUAC/Skaane Scenario).

6.2 Military positions

The relevance of military positions for the business case is not specifically covered in the Terms of Reference and is described here in order to cover all working entities of the control centres. The following has been basis for the case study:

Swedish military positions will be dedicated to Swedish Military, for handling military traffic in Swedish airspace.
These positions will have to coordinate and cooperate with the centre sectors in Stockholm, Copenhagen and Malmö regarding Swedish airspace.

Danish military positions will be dedicated to Danish Military, for handling military traffic in Danish airspace.
These positions will have to coordinate and cooperate with sectors in Copenhagen and Malmö regarding Danish airspace.

For handling military traffic in Swedish and Danish FIR, following positions will be established.

Swedish Military Merger Scenario:

Mil South:
Assigned Swedish airspace 2 executive

Mil North:
Assigned Swedish airspace 2 executive

Danish Military Merger Scenario:

RG:
Danish FIR 1 executive and 1 planner

RM:
Danish FIR 1 executive and 1 planner

RU:
Danish FIR 1 executive and 1 planner

MDS:
Danish FIR 1 FDO position

6.3 Sectors handling En-Route traffic

The sectors will handle a homogeneous kind of traffic on en-route tracks, as spacing to and from the major airports will be done from ACC sectors to terminal sectors in a TRACON like setup.

The lateral extent of the areas has been based on estimated climb and descend profiles for traffic to and from the major airports, ensuring seamless transfer of traffic to and from the approach/departure areas and high-level en route sectors.

6.3.1 Area of Responsibility (AoR)

ACC AoR will be the entire Swedish and Danish FIR from SL/GND to FL 460/660, excluding airspace delegated to TRACONS and other ATC units. The area shall be divided into 20 sectors and extend as shown in MAP 1 and MAP 2[2].

6.4 Sectors handling Stockholm Area traffic

The sectors around Stockholm will mostly be handling traffic to and from Stockholm/Arlanda and Stockholm/Bromma. The approach area (TRACON) will consist of present approach area and the surrounding En Route sectors for feeder/stacker purposes etc.

The lateral extent of the area has been based on estimated climb and descent profiles for traffic to and from Arlanda and Bromma, ensuring seamless transfer of traffic to and from the TRACON area and high-level en route sectors.

6.4.1 Area of Responsibility

The approach part of the area shall be divided into 3 separate sectors and extend as shown in MAP 3 from ground to FL 195. The number of sectors is expected to remain constant, but the layout will vary depending on runways in use at Arlanda and Bromma. The en route part of the airspace shall extend as shown in MAP 3 from ground to FL 285, excluding airspace delegated to other ATC units.

6.5 Sectors handling Copenhagen Area traffic

The sectors around Copenhagen will consist of the approach area (TRACON) described in the Skaane Project, Feasibility Phase, Final Report, and the surrounding Swedish and Danish En Route sectors and the surrounding En Route sectors for feeder/stacker purposes etc. and will mostly be handling traffic to and from Copenhagen/Kastrup and Malmö/Sturup airports.

The lateral extent of the area has been based on estimated climb and descent profiles for traffic to and from Kastrup and Sturup, ensuring seamless transfer of traffic to and from the approach area (TRACON) area and high-level en route sectors.

[2] All MAPS's are found in chapter 11

6.5.1 Area of Responsibility

The approach part of the area shall extend as shown in MAP 4 from ground to FL 195, excluding airspace delegated to Roskilde, Ängelholm and Ljungbyhed. The approach area will be divided into 4 separate sectors, the number of sectors is expected to remain constant, but the layout will vary depending on runways in use at Kastrup and Sturup. The en route part of the airspace shall laterally extend as shown in MAP 4 from ground to FL 285, excluding airspace delegated to other ATC units.

6.6 En Route sectors and positions

Sector 101:
GND – FL 460 1 executive and 1 planner

Sector 101 is almost similar to ESOS sector K with an extension north of sector 102 from Norwegian borderline to the Finnish borderline.

Sector 101 will be handling:

- Traffic to and from a number of airports in the area: Kiruna, Gällivare, Vidsel, Luleå, Arvidsjaur, Skellefteå, and a number of small airports.
- Transit traffic to/from Finland and Far East to/from North America.
- Transit Norwegian domestic traffic to/from northern part of Norway.
- OAT flights in training area.

Sector 102:
GND – FL 460 1 executive and 1 planner

Sector 102 is almost similar to ESOS sector F with an extension north of sector 103 from Norwegian borderline to the Finnish borderline.

Sector 102 will be handling:

- Traffic to and from a number of airports in the area: Östersund, Örnsköldsvik, Kramfors, Sundsvall, Sveg.
- Traffic to/from Stockholm TMA.
- Transit traffic to/from Finland and Far East to/from North America.
- Transit Norwegian domestic traffic to/from Oslo TMA to/from Northern part of Norway.

Sector 103:
GND – FL 460 1 executive and 1 planner

The extension of 103 covers the area from the Norwegian borderline crossing Mid-Sweden to the Finnish borderline.

Sector 103 will be handling:

- Traffic to and from a number of airports in the area: Karlstad, Borlänge, Mora.
- Traffic to/from Stockholm TMA.
- Traffic to/from Oslo TMA.
- Transit traffic to/from Finland.
- Crossing traffic overhead Stockholm TMA.

Sector 104:
FL 285 – FL 460 1 executive and 1 planner

Sector 104 is similar to present ESMM sector W.

Sector 104 will be handling:

- Traffic to and from Stockholm Airports.
- Transit traffic from Finland and the Far East.
- Initial spacing for arriving traffic Stockholm/Arlanda.

Sector 105:
FL 285 – FL 460 1 executive and 1 planner

Sector 105 is a sector in Swedish airspace established due to increased traffic on tracks from southeast to the northwest v.v. that is conflicting with traffic on tracks from southwest to northeast v.v.
It covers the Baltic Sea area and the Island of Gotland up to the border to Finland.

Sector 105 will be handling:

- Transit traffic to and from Finland and further eastbound.
- Inbound/outbound traffic to Stockholm airports.
- Crossing traffic southeast – northwest v.v. and traffic southwest – northeast v.v.

Sector 106:
GND – FL 285 1 executive and 1 planner

Sector 106 is similar to today's ESMM sector 5 slightly moved to the northeast, covering the area from the Swedish west coast up to Feeder Stacker sectors in Stockholm TRACON.

Sector 106 will be handling:

- Gothenburg traffic coming from/departing east/northeast bound.
- Coordination to Såtenäs TMC for handling of OAT flights.

- Traffic to and from Örebro, to and from Karlstad.

Sector 107:
FL 285 – FL 460 1 executive and 1 planner

The extension of sector 107 is from the Swedish west coast to the west up to Stockholm TMA. In the northwest the sector will follow the Swedish/Norwegian borderline.

Sector 107 will be handling:

- Traffic to and from Stockholm Airports
- Transit traffic to/from Finland and the Far East.
- Two crossing tracks for Oslo traffic to/from the southeast.
- Initial spacing for arriving traffic Stockholm/Arlanda.

Sector 108:
GND – FL 285 1 executive and 1 planner

This sector will enclose the airspace between Stockholm and Copenhagen TRACON sectors. The extension of sector 108 is from the Swedish west coast (Göteborg TMA) to the Swedish east coast.

Sector 108 will be handling:

- Traffic to and from airports in the area: Jönköping, Växjö, Linköping, Skavsta, Ronneby, Kalmar and Visby.
- Coordination to Ronneby TMC for handling of OAT flights.
- OAT training flights to training areas will be handled via this sector.

Sector 109:
FL 285 – FL 460 1 executive and 1 planner

Sector 109 is almost similar to today's ESMM sector 2, with an extension towards west in to Danish airspace.

Sector 109 will be handling:

- Traffic to and from Stockholm Airports.
- Transit traffic from Finland/Far East.
- Traffic between TRACON Copenhagen/Skaane and TRACON Stockholm.
- Two crossing tracks for Göteborg/Oslo traffic to the southeast.

Sector 110:
GND – FL 345 1 executive and 1 planner

The extension of sector 110 is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a mix of today's ESMM sector 7 and 8 but not including the area over Ronneby/Kalmar below FL285.

Sector 110 will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

Sector 111:
FL 345 – FL 460 1 executive and 1 planner

The extension of sector 111 is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a combination of parts of today's ESMM sector 6 and 9.

Sector 111 will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

Sector 112:
FL 285 – FL 345 1 executive and 1 planner

Sector 112 is crossing today's FIR boundary and covering Southern part of Sweden, Eastern part of Sjaelland, Lolland and Falster.

Sector 112 will be handling traffic:

- From Copenhagen and Sturup, coming from sector 141 bound for UACC Maastricht.
- Transiting from one adjacent sector to another at cruising FL.

Sector 113:
FL 345 – FL 660 1 executive and 1 planner

Sector 113 lateral extension is similar to Sector 112.

Sector 113 will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL.

Sector 114:
FL 285 – FL 345 1 executive and 1 planner

Sector 114 is almost similar to today's EKDK sector C, covering south-eastern part of Jutland, Fyn and Western part of Sjaelland.

Sector 114 will be handling traffic:

- Inbound Copenhagen coming from UACC Maastricht and Sector 119.
- From Copenhagen, coming from sector 143, bound for UACC Maastricht or sector 120.
- Transiting from one adjacent sector to another at cruising FL.

Sector 115:
FL 345 – FL 660 1 executive and 1 planner

Sector 115 lateral extension is similar to sector 114.

Sector 115 will be handling traffic:

- From Copenhagen, coming from sector 114 bound for UACC Maastricht or the North Sea.
- Transiting from one adjacent sector to another at cruising FL.

Sector 116:
GND – FL 285 1 executive and 1 planner

Sector 116 is almost similar to today's EKDK sector L, covering the area north of a line from Jutland's West Coast, via Billund, Århus and up to the Danish/Swedish border at Göteborg.

In Merger Scenario sector 115 border will be moved east, crossing today's FIR boundary, to handle traffic between Copenhagen and Oslo.

Sector 116 will be handling traffic:

- To and from Aalborg, to and from Billund/Århus bound for destinations north of Billund.
- To and from Göteborg, coming from/departing to west/southwest.
- Inbound Copenhagen and Göteborg coming from Norway and sector 117.
- From Copenhagen, coming from sector 144, bound for Norway or the Atlantic.

Sector 117:
FL 285 – FL 345 1 executive and 1 planner

Sector 117 is similar to today's EKDK sector V, covering the same area as described for sector 116, except for the adjustment towards east, as sector 117 will follow the Danish/Swedish borderline.

Sector 117 is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.

- Traffic to and from Copenhagen and Göteborg.

Sector 118:
FL 345 – FL 660 1 executive and 1 planner

Sector 118 is similar to today's EKDK sector 4, covering the same area as described for sector 117.

Sector 118 is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.

- Traffic to and from Copenhagen and Göteborg.

Sector 119:
GND – FL 660 1 executive and 1 planner

Sector 119 is almost similar to today's EKDK sector S, covering the area from Billund and south/southwest to the German border.
In Merger Scenario sector 119 eastern border (along sector 114 /115) has been moved a bit towards west.

Sector 119 will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL, with the main objective to ensure a safe cross for high-level transit traffic going east/west and north/south meeting overhead Esbjerg.

- To and from Billund coming from/departing to west/southwest.

Sector 120:
FL 85 – FL 660 1 executive and 1 planner

The extension of sector 120 is the same as it is for the EKDK sector N today, handling traffic in the North Sea west of Jutland.

Today a sector F is defined in the North Sea from GND – FL 85 handling mostly helicopter offshore traffic and operated by Copenhagen Information.

Sector 120 will be handling:

- High-level transit traffic above FL 285 from one adjacent sector to another at cruising FL.

6.7 Approach and Feeder/Stacker Sectors

In the following chapter sectors described will approach sectors and feeder/stacker sectors.

The approach sectors shall extend from ground to FL 195 and the feeder/stacker sectors shall extend from ground to FL 245/285 as shown in the MAP's shown in chapter 11, excluding airspace delegated to other ATC-units.

The proposed concept ensures a seamless transfer between the en route sectors and the feeder/stacker sectors:

The En Route part and the airspace are shown in MAP 3, ESOS sector 4 and sector 6 are today combined en-route and Feeder/Stacker sectors. The rest will be transformed to sector 102, 103 and 105.

Sector 121:
Stockholm Approach 1 planner

Responsible for co-ordination within Stockholm TMA, for inbound and outbound traffic to Arlanda and Bromma.

The APPCO shall handle the regulation of traffic to the approach area, primarily in peak hours. With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area of overloading. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where APPCO support is appropriate

Sector 122:
Not determined 1 executive

Responsible for the monitoring of independent approaches and departures on RWY 01L/ 01R and 19L/19R at Arlanda.

Sector 123:
GND – FL 195 2 executive

Main sector for inbound traffic to Arlanda.

Sector 123 will be handling:

- Arr-123 responsible for sector 123
- Dir-123 handles inbound traffic to Arlanda within sector 123

Sector 124:
GND – FL 195 3 executive

Main sector for outbound traffic from Arlanda.

Sector 124 will be handling:

- Arr-124 responsible for sector 124
- Dir-124 handles inbound traffic to Arlanda within sector 124
- Dep-124 handles outbound traffic from Arlanda within sector 124

Sector 125:
GND – FL105 2 executive

Main sector for traffic to/from Bromma.

Sector 125 will be handling:

- APP-125 responsible for sector 125
- Dir-125 handles inbound traffic to Bromma within sector 125

Sector 126:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 2.

Sector 126 will be handling:

- Outbound and inbound traffic to Bromma and Arlanda via TRS

Sector 127:
GND – FL 285 1 executive and 1 planner

Sector 127 will be handling:

- Arriving traffic to Arlanda and Bromma via HMR.
- Departing traffic from Arlanda and Bromma via RESNA.

Sector 128:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 6.

Sector 128 will be handling:

- Arriving traffic to Arlanda and Bromma via XILAN
- Departing traffic from Arlanda via NTL and BABAP
- Departing traffic from Bromma via NTL and ALOLA

Sector 129:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 7.

Sector 129 will be handling:

- Arriving traffic to Bromma via TINKA.
- Departing traffic from Arlanda and Bromma via NOSLI and DKR

Sector 130:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 8.

Sector 130 will be handling:

- Arriving traffic to Arlanda via ELTOK
- Arriving traffic to Bromma via ARS
- Departing traffic from Arlanda via KOGAV and ARS
- Departing traffic from Bromma via ARS

Sector 131:
GND to FL 195 1 executive (Departure 131)

Departure 131 will be handling:

- Departing traffic from Kastrup and transiting traffic through sector 131.

Sector 132:
GND to FL 195 2 executives (Departure/Approach 132)

Departure 132 will be handling:

- Departing traffic from Kastrup and transiting traffic through sector 132.
- Separate departing and arriving traffic to and from Roskilde transiting sector 132.

Approach 132 will be handling:

- Traffic transiting sector 132 inbound for Kastrup.

Sector 133:
GND to FL 195 2 executives (Departure/Approach 133/Final Sturup)

Sector 133 consists of two positions in a flexible solution, in order to handle both departure and approach 133 or Final Sturup.

Departure 133 will be handling:

- Departing traffic from Sturup and Kastrup, and transiting traffic through sector 133.

Approach 133 will be handling:

- Traffic transiting sector 133 inbound for Sturup.

Final Sturup will be handling:

- Traffic transferred from approach 133 and approach 134 inbound for Sturup.

Sector 134:
GND to FL 195 2 executives (Departure/Approach 134)

Departure 134 will be handling:

- Departing traffic from Sturup and Kastrup, and transiting traffic through sector 134.

Approach 134 will be handling:

- Traffic transiting sector 134 inbound for Kastrup and Sturup.

Sector 135:
Extension not determined 1 executive

The airspace is yet to be defined, but the position will require one executive (ref. Skaane Project Feasibility Phase Final Report).

Final 135 will be handling:

- Traffic transferred from approach 132 and approach 134 inbound for Kastrup.

Sector 137:
Skaane Approach 2 planner

APPCO: The Approach Co-ordinator is a control position with the responsibility for the co-ordination and flight clearances between the approach sectors and adjacent sectors, including the towers in Roskilde, Kastrup, and Sturup airports. The APPCO shall handle the regulation of traffic to the approach area, primarily in peak hours.

With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area of overloading. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where APPCO support is appropriate.

Sector 138:
GND – FL 285 1 executive and 1 planner

Sector 138 is similar to today's ESMM sector 1 slightly restricted to the north-east and West, covering the area from the Swedish west coast up to Sector 107 and Sector 108.

Sector 138 will primary be handling:

- Arriving traffic to EKCH via KULLE[3]

Sector 139:
GND – FL 285 1 executive and 1 planner

[3] KULLE is a fictitious point, which in the Skaane Feasibility Phase Report replaces SVD VOR as inbound fix.

Sector 139 is similar to today's ESMM sector 3 slightly restricted to the north-east, covering the central part of southern Sweden up to Sector 108.

Sector 139 will be handling:

- Arriving traffic to ESMS via KEMAX
- Departing traffic from EKCH and ESMS via ASTOS, KEMAX, PERRY and NEXIL.

Sector 140:
GND – FL 285 1 executive and 1 planner

Sector 140 is similar to today's ESMM sector S slightly restricted to the East, covering the area from the Swedish South coast up to Sector 139 and Sector 108.

Sector 140 will be handling:

- Arriving traffic to EKCH and ESMS via ELVIX[4] and KOTAM
- Departing traffic from EKCH and ESMS via SIMEG and BALOX departures.

Sector 141:
GND – FL 285 1 executive and 1 planner

Sector 141 is similar to today's EKDK sector B, covering the south-eastern part of Danish FIR between Sector 140 and Sector 142.

Sector 141 is crossing today's FIR boundary.

Sector 141 will be handling:

- Arriving traffic to EKCH and ESMS via CDA.
- Departing traffic from EKCH and ESMS via SALLO.

Sector 142:
GND – FL 285 1 executive and 1 planner

Sector 142 is similar to today's EKDK sector I, covering the area south of the APP area to the German border between Sector 141 and Sector 143.

Sector 142 will be handling:

- Departing traffic from EKCH and ESMS via BISTA, MAXEL and TOBIS

Sector 143:
GND – FL 285 1 executive and 1 planner

[4] ELVIX replaces in the Skaane Feasibility Phase Report ALM VOR as inbound fix.

Sector 143 is similar to today's EKDK sector D, covering the area west of the APP-area between Sector 141 and Sector 144.

Sector 143 will be handling:

- Arriving traffic to EKCH via LUGAS.
- Departing traffic from EKCH and ESMS via DOBEL.

Sector 144:
GND – FL 285 1 executive and 1 planner

Sector 144 is similar to today's EKDK sector E, covering the area north-west of the APP-area between Sector 143, Sector 116 and Sector 138.

Sector 144 will be handling:

- Arriving traffic to EKCH via ROSBI
- Departing traffic from EKCH and ESMS via SORGA, MIRGO and NOA

6.7.1 Support positions

Operational support for the three centres has been calculated as:

- 5 x SUP
- 1 x TAC SUP
- 1 x FMP
- 4 x COIF
- 7 x FDO
- 3 x TECH SUP
- 3 x COOR

Other
Following positions/operator roles are not included in the overall count concerning positions.

- 1 x DATMAS TECH
- 2 x WSS
- 1 x ATM
- 1 x COM
- 1 x CANDI
- 2 x AFTN
- 1 x CACOM
- 1 x CNS Building
- 1 x FIGARO

6.8 Summary of sectors and positions Merger Scenario

Merger Scenario: Sectors and positions

Military

Sector 1	Executive	Planner	FDO	FMP	Support	Total
Swedish Military Merger Scenario	4					4
Danish Military Merger Scenario	3	3	1			7
Total	**7**	**3**	**1**			**11**

Centres

Sector name	Executive	Planner	FDO	FMP	Support	Total
101	1	1				2
102	1	1				2
103	1	1				2
104	1	1				2
105	1	1				2
106	1	1				2
107	1	1				2
108	1	1				2
109	1	1				2
110	1	1				2
111	1	1				2
112	1	1				2
113	1	1				2
114	1	1				2
115	1	1				2
116	1	1				2
117	1	1				2
118	1	1				2
119	1	1				2
120	1	1				2
121		1				1
122	1					1
123	2					2
124	3					3
125	2					2
126	1	1				2
127	1	1				2
128	1	1				2
129	1	1				2
130	1	1				2
131	1					1
132	2					2
133	2					2
134	2					2
135	1					1
137		2				2
138	1	1				2
139	1	1				2

Sector name	Executive	Planner	FDO	FMP	Support	Total
140	1	1				2
141	1	1				2
142	1	1				2
143	1	1				2
144	1	1				2
Operational support	5	5	7	1	6	24
Total	**54**	**40**	**7**	**1**	**6**	**107**

7 NUAC/Skaane Scenario

7.1 General

NUAC/Skaane Scenario is original NUAC/Skaane project as described in the Skaane Project Feasibility Phase Final Report January 2004 and NUAC Phase 1 Report.

7.1.1 Original NUAC Project

The aim of the original NUAC Project was to establish an organisation, to which the responsibility for provision of ATS above FL 285 in the Nordic States could be transferred.

The work should be based on the assumption that the operating facility was to be Malmö ATCC.

The operational concept was based on currently applied methodology at the new ATC system at Malmö, EUROCAT 2000E.

On an early stage in the project Norway and Finland withdraw as active partners in the project along with the respective airspace above FL 285, above these states.

As Sweden and Denmark continued the planning towards a future NUAC company, an update of the sectorisation proposal for the “Nordic One Sky” as proposed in NUAC Phase 1 report, Annex 4 had to be made, as this airspace consisted of the airspace above all 4 Nordic States.

The implementation of NUAC was to be conducted in several steps.

Step 1: Transferral of existing Swedish sectors above FL 285 (according to “Implementeringsplan Sweden”).
Step 2: Transferral of existing Danish sectors above FL 285.
Step 3: Optimisation of airspace above FL 285 in Sweden and Denmark.

“Implementeringsplan Sweden” was never completed, so the Swedish sectors for transferral are not to be compared with Swedish transferral sectors as described in NUAC Phase 1 Report, Annex 4.

7.1.2 Sector Comparison between the original NUAC/Skaane project against NUAC Programme Scenario "NUAC/Skaane" scenario

Number of sectors/positions in the original NUAC/Skaane project			Number of sectors/positions in the NUAC Programme scenario "NUAC/Skaane"		
Copenhagen #1	Malmö #2	Stockholm #4	Copenhagen #1	Malmö #2	Stockholm
Military positions: 3 Planner 3 Executive 1 Assistant	4 planner or executive	N/A	Military positions: 3 Planner 3 Executive 1 Assistant	Military positions: #3 2 Planner 2 Executive	#3
Approach positions: 9 Executive 2 Planner	N/A	N/A	Approach positions: 9 Executive 2 Planner	N/A	Approach positions: 8 Executive 1 Planner
En route positions: 9 Executive 9 Planner 3 Assistants	En route positions: 21 Executive 21 Planner 2 Assistants	N/A	En route positions: 9 Executive 9 Planner 3 Assistants	En route positions: 16 Executive 16 Planner 2 Assistants	En route positions: 9 Executive 9 Planner 2 Assistants
Copenhagen information: 2 Executive 2 Planner	N/A	N/A	Copenhagen information: 2 Executive 2 Planner	N/A	N/A
Other: Operational support: 6 Technical support: 1	Other: Operational support: 2 Technical support: ?	N/A	Other: Operational support: 6 Technical support: 1	Other: Operational support: 2 Technical support: 1	Other: Operational support: 4 Technical support: 1
Number of sectors: Approach: 4 En route: 9	Number of sectors: En route: 21	N/A	Number of sectors: Approach: 4 En route: 9	Number of sectors: En route: 16	Number of sectors: Approach: 3 En route: 9
Positions total: 50	50	N/A	Positions total : 50	41	34

Explicit:

#1: The prerequisites for NUAC Programme scenario "NUAC/Skaane" is identical to the original Skaane project, which means no difference in the results.

#2: The number of sectors in the NUAC Programme has been reduced from 21 (and thus 42 en route positions) to 16 sectors, as the original NUAC project included the airspace above FL 285 in Norway and Finland.

#3: Operational military requirements were not part of the original NUAC/Skaane projects and hence no number and placement of positions was calculated. In the NUAC Programme there has been calculated an estimated requirement for 4 positions. It has not been contemplated whether these positions shall be placed in Stockholm or Malmö or both.

#4: All requirements and plans for the area around Stockholm in the original NUAC/Skaane project were described in "*implementeringsplan Sverige"*, but since this plan never came into effect or was implemented and is now abandoned the would be figures and plans cannot be described today.

7.1.3 Comments regarding sector contemplations from the original NUAC and Skaane projects against the sectors in this chapter:

- As far as possible the sectors described in this Airspace Design Report are those described in the original NUAC/Skaane project," step 2".

- As the border between Stockholm and Skaane were dependent of "Implementeringsplan Sverige", - which was never finished - the border has been slightly changed in this report concerning the "NUAC/Skaane" scenario, but this has no effect on the number of positions.

- As the original NUAC"step 2", - known as"One Nordic Sky" - included Swedish, Danish, Norwegian and Finnish airspace, it has been necessary to alter the sectors that involved airspace over Norwegian and Finnish airspace.

- Sector 201 is established where 3 cross-border sectors came together in the entire North Scandinavian airspace in the original NUAC project which makes for no comparison. Sector 201 must be regarded as new in the "NUAC/Skaane" scenario in this report.

- Sectors 202, 204, 213, 214 and 215 has all been adjusted with relation to Norwegian airspace as Norwegian airspace does not form part of the new scenario "NUAC/Skaane" to be described in this report.

7.1.4 Original Skaane Project

The Skaane Airspace was supposed to include all Danish and Southern part of Swedish airspace below FL 285. Within this airspace a large TMA for Copenhagen, Roskilde and Malmö Sturup airport was planned in order to optimise safety and efficiency for the airspace involved.

The operating facility was to be Copenhagen ACC/APP and all staff should have been employed by NAVIAIR.

The implementation of Skaane Project was to be conducted in two steps.

Step 1: Transferral of existing Swedish sectors below FL 285 to Copenhagen ACC using the CATCAS system. All procedures and design of airspace should

remain intact.[5] Swedish staff should as well be transferred and their new employer should be NAVIAIR.

Step 2: After implementation of DATMAS an optimisation of the airspace should take place in order to utilize the benefits of a merger of airspace across the Danish - Swedish border. A large TMA for Copenhagen, Roskilde and Sturup airport was created with attached in- and outbound sectors. An extensive re-education of staff should take place.

Skaane Project should define and negotiate the prerequisites and conditions in accordance with regulations, the possibilities for NAVIAIR to take over the service provision for approach functions to Sturup Airport. This project included service provision in the southern part of Swedish airspace below FL 285 and in the entire Danish Airspace below FL 285 connected to the approach control functions. The aim was to provide a safe, efficient and cost-effective service provision for Sturup, Kastrup and Roskilde Airports and to ensure a seamless transfer to and from NUAC airspace. A survey of the possibilities, and if cost-effective, to let NAVIAIR take over the service provision for final approach and aerodrome control functions for Sturup Airport was part of the original Skaane Project, but this will not be included in this report.

The implementation of Skaane Project was to be conducted in two steps, one before DATMAS and one after; however, a possible implementation of the Original Skaane Project is no longer feasible before DATMAS, and NUAC/Skaane Scenario will consequently relate to step 2 only.

7.2 Military positions

The relevance of military positions for the business case is not specifically covered in the Terms of Reference and is described here in order to cover all working entities of the control centres. The following has been basis for the case study:

Swedish military positions will be dedicated to Swedish Military, for handling military traffic in Swedish airspace.

Danish military positions will be dedicated to Danish Military, for handling military traffic in Danish airspace.

For handling military traffic in Swedish and Danish FIR, following positions will be established.

Swedish Military NUAC/Skaane Scenario:

Mil South:
Assigned Swedish airspace 2 executive

Mil North:
Assigned Swedish airspace 2 executive

[5] The Swedish sectors with Northeastern border towards Stockholm ATCC, would have to be reduced, so that only the airspace relevant for arriving/departing traffic to/from Skaane TMA would be part of Skaane airspace.

Danish Military NUAC/Skaane Scenario:

RG:
Danish FIR 1 executive and 1 planner

RM:
Danish FIR 1 executive and 1 planner

RU:
Danish FIR 1 executive and 1 planner

MDS:
Danish FIR 1 FDO position

7.3 ATCC Malmö

Malmö ACC will be handling En Route traffic above FL 285 in both Swedish and Danish FIR.

7.3.1 Area of Responsibility

Malmö ACC AoR will be the entire Swedish and Danish FIR from FL285 to FL UNL/660. The area shall be divided into 16 sectors and extend as shown in MAP 5.

7.3.2 En Route sectors and positions

The sectors described below will be as close as possible to the original NUAC "One Nordic Sky", as described in NUAC Phase 1 Report Appendix 4.

The sectors in the northern part of Sweden and Denmark have been adjusted, due to the borderlines to Norway and Finland.

Some sectors are therefore not directly comparable to the sectors described in NUAC Phase 1 Report, Appendix 4.

Sector 201 Malmö:
FL285 – FL 460 1 executive and 1 planner

Sector 201 Malmö is covering the whole area of Norrland with an extension north of sector 202 Malmö from Norwegian borderline to the Finnish borderline,

Sector 201 Malmö will be handling:

- Traffic to Stockholm TMA to/from airports in northern Sweden.
- Transit traffic to/from Finland and Far East to/from North America.
- Transit Norwegian domestic traffic to/from Northern part of Norway.

Sector 202 Malmö:
FL285 – FL 460 1 executive and 1 planner

The extension of sector 202 Malmö is from Norwegian borderline crossing Mid-Sweden to the Finnish borderline.

Sector 202 Malmö will be handling:

- Traffic to/from Stockholm TMA.
- Traffic to/from Oslo TMA.
- Transit traffic to/from Finland.
- Crossing traffic overhead Stockholm TMA.

Sector 203 Malmö:
FL 285 – FL 460 1 executive and 1 planner

Sector 203 Malmö is similar to ESMM sector W with extension up to the Finnish borderline.

Sector 203 Malmö will be handling:

- Traffic to and from Stockholm Airports.
- Initial spacing for arriving traffic Stockholm/Arlanda.
- Transit traffic from Finland and the Far East.
- Crossing traffic overhead Stockholm TMA

Sector 204 Malmö:
FL 285 – FL 460 1 executive and 1 planner

The extension of sector 204 Malmö is from the Swedish west coast up to Stockholm TMA. In the northwest the sector will follow the Swedish/Norwegian borderline.

Sector 204 Malmö will be handling:

- Traffic to and from Stockholm Airports
- Transit traffic to/from Finland and the Far East.
- Two crossing tracks for Oslo traffic to/from the southeast.
- Initial spacing for arriving traffic Stockholm/Arlanda.

Sector 205 Malmö:
FL 285 – FL 460 1 executive and 1 planner

Sector 205 Malmö is similar to today's ESMM sector 2, covering the area from Skaane and to the northeast to the border where traffic is climbing/descending out of Stockholm airports.

Sector 205 Malmö will be handling:

- Traffic to and from Stockholm Airports.
- Transit traffic from Finland/Far East.
- Crossing traffic from Göteborg/Oslo to the southeast v.v.

Sector 206 Malmö:
FL 285 – FL 460 1 executive and 1 planner

This sector covers the Baltic Sea area and the Island of Gotland up to the border to Finland.

Sector 206 Malmö will be handling:

- Transit traffic to and from Finland and further eastbound.
- Inbound/outbound traffic to Stockholm airports.
- Crossing traffic southeast – northwest v.v. and traffic southwest – northeast v.v.

Sector 207 Malmö:
FL285 – FL 345 1 executive and 1 planner

The extension of sector 207 Malmö is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a combination of parts of today's ESMM sector 7 and sector 8.

Sector 207 Malmö will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

Sector 208 Malmö:
FL 345 – FL 460 1 executive and 1 planner

The extension of sector 208 Malmö is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a combination of parts of today's ESMM sector 6 and sector 9.

Sector 208 Malmö will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.

- A number of crossing points for traffic from southeast to northwest v.v.

Sector 209 Malmö:
FL 285 – FL 345 1 executive and 1 planner

Sector 209 Malmö is crossing today's FIR boundary and covering Southern part of Sweden, Eastern part of Sjaelland, Lolland and Falster.

Sector 209 Malmö will be handling:

- Traffic from Copenhagen and Sturup, coming from sector 234 Copenhagen, bound for UACC Maastricht.

- Transiting and crossing En route traffic.

Sector 210 Malmö:
FL 345 – FL 660 1 executive and 1 planner

Sector 210 Malmö's lateral extension is similar to Sector 209 Malmö.

Sector 210 Malmö will be handling:

- Transiting and crossing En Route traffic

Sector 211 Malmö:
FL285 – FL345 1 executive and 1 planner

Sector 211 Malmö is similar to the lateral extension of today's EKDK sector S and sector C, with the exemption of an area northwest of Zealand

Sector 211 Malmö will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL

- High-level transit traffic going east/west and north/south meeting overhead Esbjerg.

- High-level transit traffic going east/west and north/south meeting overhead Odense.

- Inbound Copenhagen coming from UACC Maastricht and Sector 212 Malmö.

- From Copenhagen, bound for UACC Maastricht or sector 212 Malmö.

Sector 212 Malmö:
FL 345 – FL 660 1 executive and 1 planner

Sector 212 Malmö's lateral extension is similar to the lateral extension of sector 211 Malmö.

Sector 212 Malmö will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL
- High-level transit traffic going east/west and north/south meeting overhead VES.
- High-level transit traffic going east/west and north/south meeting overhead ODN.

Sector 213 Malmö:
FL 285 – FL 345 1 executive and 1 planner

Sector 213 Malmö is adjusted, as a cross-border sector between Norway and Denmark was planned in the area.

Sector 213 Malmö is similar to today's EKDK sector V

Sector 213 Malmö is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.
- Traffic to and from Copenhagen and Göteborg.

Sector 214 Malmö:
FL 345 – FL 660 1 executive and 1 planner

Sector 214 Malmö is adjusted, as a cross-border sector between Norway and Denmark was planned in the area.

Sector 214 Malmö is similar to today's EKDK sector 4, with the same lateral extension as described for sector 213 Malmö.

Sector 214 Malmö is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.
- Traffic to and from Copenhagen and Göteborg.

Sector 215 Malmö:
FL 285 – FL 660 1 executive and 1 planner

Sector 215 Malmö is adjusted, as a cross-border sector between Norway and Denmark was planned in the area.

The extension of sector 215 Malmö is the same as it is for the EKDK sector N today, handling traffic in the North Sea west of Jutland.

Sector 215 Malmö will be handling:

- High-level transit traffic above FL 285 from one adjacent sector to another at cruising FL.

Sector 216 Malmö:
Extension not determined 1 executive and 1 planner

In order to handle traffic exceeding capacity limit the following solutions have been used.
- Reference N3/N21 (sector 211 Malmö/sector 212 Malmö) one extra sector is needed 5 hours/day (reference NUAC Phase 1 Report, Appendix 4).
- Reference N10/N13 (sector 203 Malmö/sector 204 Malmö) one extra sector is needed 5 hours/day (reference NUAC Phase 1 Report, Appendix 4).
- Two extra workstations needed (reference NUAC Phase 1 Report, Appendix 4).

7.3.3 Support positions

Operational Support
- 2 x SUP
- 2 x FDO
- 1 x TECH SUP

Other
Following positions/operator roles are not included in the overall count concerning positions.

- 1 x FIGARO
- 1 x WSS

7.4 ATCC Stockholm

”Implementeringsplan Sverige” describes a step by step transferral of all airspace in Sweden UIR/FIR: Below Fl 285 to Stockholm ATCC; above FL 285 to Malmö ATCC. The assumption was the new Eurocat 2000-system and its upgrading, to be able to handle for instance re-entering flights. Due to system delays, those steps were only partly realised. In autumn 2003 a study was made in Stockholm how to, in an efficient way, divide the airspace below FL 285. After a few adaptations (Skaane area) that is the base for calculation in NUAC/Skaane Scenario.

7.4.1 Area of Responsibility

Sweden FIR below FL 285 except for Skaane area, as shown in MAP 6.

7.4.2 En Route sectors and positions

General:

All sectors handles:

- En route traffic within their respective area of responsibility.
- Departing and arriving traffic to domestic aerodromes.

Sector 217 Stockholm:
GND – FL 285 1 executive and 1 planner

Sector 217 Stockholm is almost similar to today's ESOS sector K, covering all the area north of Sundsvall/Östersund to Norwegian and Finnish borderline.

Sector 217 Stockholm will be handling:

- Traffic to and from airports in the area: Kiruna, Gällivare, Vidsel, Luleå, Arvidsjaur, Skellefteå, Umeå, Örnsköldsvik, Östersund and a number of small airports.
- OAT flights in training area.

Sector 218 Stockholm:
GND – FL 285 1 executive and 1 planner

The lateral extension of sector 218 Stockholm is north of Stockholm/Karlstad up to Sundsvall/Östersund from Norwegian till Finish borderline.

Sector 218 Stockholm will be handling:

- Traffic to/from Stockholm Airports
- Traffic to/from a number of airports in the area: Karlstad, Mora, Sveg, Sundsvall, Kramfors, and a number of small airports.
- Traffic to/from Oslo TMA.

Sector 219 Stockholm:
GND – FL 285 1 executive and 1 planner

Feeder/Stacker sector, similar extension as today's ESOS sector 8.

Sector 219 Stockholm will be handling:

- Arriving traffic to Arlanda via ELTOK
- Arriving traffic to Bromma via ARS
- Departing traffic from Arlanda via KOGAV and ARS
- Departing traffic from Bromma via ARS

Sector 220 Stockholm:
GND – FL 285 1 executive and 1 planner

Sector 220 Stockholm is similar to today's ESMM5 sector 5 slightly moved to the northeast, covering the area from the Swedish west coast up to Stockholm Feeder/Stacker sectors.
Sector boundary to the northeast is connecting sector 220 Stockholm to Feeder/Stacker sectors.

Sector 220 Stockholm will be handling:

- Gothenburg traffic coming from/departing east/northeast bound.
- Coordination to Såtenäs TMC for handling of OAT flights.
- Traffic to and from Örebro, to and from Karlstad.

Sector 221 Stockholm:
GND – FL 285 1 executive and 1 planner

Feeder/Stacker-sector with similar extension as today's ESOS sector 7.

Sector 221 Stockholm will be handling:

- Arriving traffic to Bromma via TINKA.
- Departing traffic from Arlanda and Bromma via NOSLI and DKR

Sector 222 Stockholm:
GND – FL 285 1 executive and 1 planner

Feeder/Stacker-sector with similar extension as today's ESOS sector 2.

Sector 222 Stockholm will be handling:

- Outbound and inbound traffic to Bromma and Arlanda via TRS

Sector 223 Stockholm:
GND – FL 285 1 executive and 1 planner

Almost same extension as today's ESOS sector 6.

Sector 223 Stockholm will be handling:

- Arriving traffic to Arlanda and Bromma via XILAN
- Departing traffic from Arlanda via NTL and BABAP
- Departing traffic from Bromma via NTL and ALOLA

Sector 224 Stockholm:
GND – FL 285 1 executive and 1 planner

This sector will include the airspace between Stockholm Feeder/Stacker sectors (ESOS sector 5 and sector 6) and Skaane area. The extension of sector 224 Stockholm is from the Swedish west coast (Göteborg TMA) to the Swedish east coast.

Sector 224 Stockholm will be handling:

- Traffic to and airports in the area: Jönköping, Växjö, Linköping, Skavsta, Ronneby, Kalmar and Visby.

- Coordination to Ronneby TMC for handling of OAT flights.
- OAT training flights to/from training areas will be handled via this sector.

Sector 225 Stockholm:
GND – FL 285 1 executive and 1 planner

The extension of sector 225 Stockholm is the very south-east part of Sweden and overhead the Baltic Sea area from the Swedish east coast to Baltic FIR-border.

Sector 225 Stockholm will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

7.4.3 APP sectors and positions

Sector 226 Stockholm:
Stockholm Approach 1 planner

Responsible for co-ordination within Stockholm TMA for inbound and outbound traffic to Arlanda and Bromma.

The APPCO shall handle the regulation of traffic to the approach area, primarily in peak hours. With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area from overload. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where support is appropriate

Sector 227 Stockholm:
Extension not determined 1 executive

Responsible for the monitoring of independent approaches and departures on RWY 01L/ 01R and 19L/19R.

Sector 228 Stockholm:
GND – FL 195 2 executive

Main sector for inbound traffic to Arlanda.

Sector 228 Stockholm will be handling:

- Arr 228 responsible for sector 228 Stockholm
- Dir 228 handles inbound traffic to Arlanda within sector 228 Stockholm

Sector 229 Stockholm:
GND – FL 195 3 executive

Main sector for outbound traffic from Arlanda.

Sector 229 Stockholm will be handling:

- Arr 229 responsible for sector 229 Stockholm
- Dir 229 handles inbound traffic to Arlanda within sector 229 Stockholm
- Dep 229 handles outbound traffic from Arlanda within sector 229 Stockholm

Sector 230 Stockholm:
GND – FL105 2 executive

Main sector for traffic to/from Bromma.

Sector 230 Stockholm will be handling:

- APP 230 responsible for sector 230 Stockholm
- Dir 230 handles inbound traffic to Bromma within sector 230 Stockholm

7.4.4 Support positions

Operational Support

- 1 x SUP
- 2 x TAC SUP
- 1 x FMP[6]
- 2 x FDO
- 1 x TECH SUP

Other
Following positions/operator roles are not included in the overall count concerning positions.

- 2 x AFTN
- 1 x WSS

7.5 Copenhagen ACC

7.5.1 Area of Responsibility

The lateral extent of the proposed area was based on typical climb and descends profiles up to FL 285 for traffic to and from Kastrup and Sturup. This means that the area shall extend about 100 NM from Kastrup Airport. Cross border sectors are designed in adherence with the EUROCONTROL FAB initiative. The lateral extension is shown in MAP 7 and the vertical extension is from ground to FL 285.

7.5.2 En Route sectors and positions

En Route sectors shall extend as shown in MAP 7 excluding airspace delegated to Copenhagen approach and other local ATS units. The airspace comprises 9 sectors,

[6] Operator role (no E2kE position)

each consisting of two positions, - one executive ATCO and one planner ATCO. A total of 18 positions are required in the proposed NUAC/Skaane Scenario.

General:

All sectors handles:

- En route traffic within their respective area of responsibility.
- Departing and arriving traffic to domestic aerodromes.

Sector 231 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 231 Copenhagen is similar to today's ESMM sector 1 slightly restricted to the north-east and West, covering the area from the Swedish west coast up to Feeder Stacker sectors in Stockholm TRACON.

Sector 231 Copenhagen will primary be handling:

- Arriving traffic to EKCH via KULLE[7]

Sector 232 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 232 Copenhagen is similar to today's ESMM sector 3 slightly restricted to the north-east, covering the central part of southern up to Feeder Stacker sectors in Stockholm TRACON.

Sector 232 Copenhagen will be handling:

- Arriving traffic to ESMS via KEMAX
- Departing traffic from EKCH and ESMS via ASTOS, KEMAX, PERRY and NEXIL.

Sector 233 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 233 Copenhagen is similar to today's ESMM sector S slightly restricted to the East, covering the area from the Swedish South coast up to Sector 232 Copenhagen and Feeder Stacker sectors in Stockholm TRACON.

Sector 233 Copenhagen will be handling:

- Arriving traffic to EKCH and ESMS via ELVIX[8] and KOTAM
- Departing traffic from EKCH and ESMS via SIMEG and BALOX departures.

[7] KULLE is a fictitious point, which in the Skaane Feasibility Phase Report replaces SVD VOR as inbound fix.
[8] ELVIX replaces in the Skaane Feasibility Phase Report ALM VOR as inbound fix.

Sector 234 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 234 Copenhagen is similar to today's EKDK sector B, covering the south-eastern part of Danish FIR between Sector 233 Copenhagen and Sector 235 Copenhagen

Sector 234 Copenhagen is crossing today's FIR boundary.

Sector 234 Copenhagen will be handling:

- Arriving traffic to EKCH and ESMS via CDA.
- Departing traffic from EKCH and ESMS via SALLO.

Sector 235 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 235 Copenhagen is similar to today's EKDK sector I, covering the area south of the APP area to the German border between Sector 234 Copenhagen and Sector 236 Copenhagen

Sector 235 Copenhagen will be handling:

- Departing traffic from EKCH and ESMS via BISTA, MAXEL and TOBIS.

Sector 236 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 236 Copenhagen is similar to today's EKDK sector D, covering the area west of the APP-area between Sector 235 Copenhagen and Sector 237 Copenhagen.

Sector 236 Copenhagen will be handling:

- Arriving traffic to EKCH via LUGAS.
- Departing traffic from EKCH and ESMS via DOBEL.

Sector 237 Copenhagen:
GND – FL 285 1 executive and 1 planner

Sector 237 Copenhagen is similar to today's EKDK sector E, covering the area north-west of the APP-area between Sector 236 Copenhagen and Sector 238 Copenhagen.

Sector 237 Copenhagen will be handling:

- Arriving traffic to EKCH via ROSBI

Sector 238 Copenhagen
GND – FL 285 1 executive and 1 planner

Sector 238 Copenhagen is similar to today's EKDK sector L, covering the area north-west of the APP-area between Sector 231 Copenhagen and Sector 237 Copenhagen

Sector 238 Copenhagen is crossing today's FIR boundary.

Sector 238 Copenhagen will be handling:

- Departing traffic from ECHH and ESMS via SORGA, MIRGO and NOA.

Sector 239 Copenhagen
GND – FL 285 1 executive and 1 planner

Sector 239 Copenhagen's lateral extension is similar to the lateral extension of today's EKDK sector N.

Sector 239 Copenhagen will be handling:

- Low-level transit traffic below FL 285 from one adjacent sector to another at cruising FL.

Today a sector F is defined in the North Sea from GND – FL 85 handling mostly helicopter offshore traffic and operated by Copenhagen Information.
The North Sea area was not included in the Skaane Project simulations.
An inconclusive discussion whether the area should be managed as today or in a different way was raised.

7.5.3 APP sectors and positions

The Approach sectors shall extend as shown in MAP 7 excluding airspace delegated to other local ATS units such as Roskilde ATC. During the investigation of the Skaane projects, an analysis of whether it could be beneficial to change the existing structure into a more practical and cost-efficient structure concerning technical, administrative, and operational aspects was suggested. This investigation was not carried out, but a number of solutions were suggested.

The proposed solution for the approach area, shown in MAP 7, was real-time simulated in Malmö late 2003. During the simulation high-density traffic was tested, and the number of sectors and positions seem appropriate; however, some adjustments are needed. In the simulation only one APPCO took part, but in order to meet the DATMAS configuration 2 APPCOs are counted for in the following.

The area shall be divided into 4 separate departure/approach sectors, named 240, 241, 242 and 243. Each sector shall consist of one or two positions, one for departing traffic and one for approaching traffic; furthermore, two approach coordinator and two final positions (final 244 and final 245) are required. Sector 240 is only a departure sector; therefore, a total of 11 positions are required in the proposed NUAC/Skaane Scenario.

Sector 240 Copenhagen:
GND to FL 195 1 executive (Departure 240)

Departure 240 Copenhagen will be handling:

- Departing traffic from Kastrup and transiting traffic through sector 240 Copenhagen.

Sector 241 Copenhagen:
GND to FL 195 2 executives (Departure/Approach 241 Copenhagen)

Departure 241 Copenhagen will be handling:

- Departing traffic from Kastrup and transiting traffic through sector 241 Copenhagen.

- Separating departing and arriving traffic to and from Roskilde transiting sector 241 Copenhagen.

Approach 241 Copenhagen will be handling:

- Traffic transiting sector 241 Copenhagen inbound for Kastrup.

Sector 242 Copenhagen:
GND to FL 195 2 executives (Departure/Approach 242 Copenhagen)

Departure 242 Copenhagen will be handling:

- Departing traffic from Sturup and Kastrup, and transiting traffic through sector 242 Copenhagen.

Approach 242 Copenhagen will be handling:

- Traffic transiting sector 242 Copenhagen inbound for Sturup.

Sector 243 Copenhagen:
GND to FL 195 2 executives (Departure/Approach 243 Copenhagen)

Departure 243 Copenhagen will be handling:

- Departing traffic from Sturup and Kastrup, and transiting traffic through sector 243 Copenhagen.

Approach 243 Copenhagen will be handling:

- Traffic transiting sector 243 Copenhagen inbound for Kastrup and Sturup.

Sector 244 Copenhagen:
Not determined 1 executive

The airspace is yet to be defined, but the position will require one executive, final 244 Copenhagen.

Final 244 Copenhagen will be handling:

- Traffic transferred from approach 241 Copenhagen and approach 243 Copenhagen inbound for Kastrup.

Sector 245 Copenhagen
Extension not determined 1 executive

The airspace is yet to be defined, but the position will require one executive, sector 245 Copenhagen.

Sector 245 Copenhagen will be handling:

- Traffic transferred from approach 242 Copenhagen and approach 243 Copenhagen inbound for Sturup.

Sector 246 Copenhagen:
Skaane Approach 2 planner

APPCO: The Approach Co-ordinator is a control position with the general responsibility for the co-ordination and flight clearances between the approach sectors and adjacent sectors, including the towers in Roskilde, Kastrup, and Sturup airports.

The APPCO shall handle the regulation of traffic to the approach area, primarily in peak hours. With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area from overload. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where support is appropriate.

7.5.4 Support positions

How VFR should be conducted and by who, was not decided in Skaane Project - Feasibility Phase Final Report. Today's handling of VFR traffic in Sweden is done by ATCO's on the relevant sector. Below is only the positions needed for handling of VFR traffic in Danish FIR. Choosing the same solution for the Swedish part of Skaane ACC will properly add 1 executive and 1 planner position.

Another solution could be to maintain status quo or handle the VFR traffic from e.g. Stockholm. In these cases no extra positions will be added.

Operational support

- 2 x SUP
- 1 x FMP
- 3 x FDO
- 3 x COOR
- 1 x TECH SUP
- 4 x COIF

Other
Following positions are not included in the overall count concerning positions.

- 1 X DATMAS TECH
- 1 x ATM
- 1 x COM
- 1 x CANDI
- 1 x CACOM

- 1 x CNS Building

7.6 Summary of sectors and positions NUAC/Skaane Scenario

NUAC/Skaane Scenario: Sectors and postions

Military

Sector name	Executive	Planner	FDO	FMP	Support	Total
Swedish Military scenario 2	4					4
Danish Military scenario 2	3	3	1			7
Total	7	3	1			11

ATCC Malmö

Sector name	Executive	Planner	FDO	FMP	Support	Total
201 Malmö	1	1				2
202 Malmö	1	1				2
203 Malmö	1	1				2
204 Malmö	1	1				2
205 Malmö	1	1				2
206 Malmö	1	1				2
207 Malmö	1	1				2
208 Malmö	1	1				2
209 Malmö	1	1				2
210 Malmö	1	1				2
211 Malmö	1	1				2
212 Malmö	1	1				2
213 Malmö	1	1				2
214 Malmö	1	1				2
215 Malmö	1	1				2
216 Malmö	1	1				2
Operational support	1	1	2		1	5
Total	17	17	2		1	37

Stockholm ATCC

Sector name	Executive	Planner	FDO	FMP	Support	Total
217 Stockholm	1	1				2
218 Stockholm	1	1				2
219 Stockholm	1	1				2
220 Stockholm	1	1				2
221 Stockholm	1	1				2
222 Stockholm	1	1				2
223 Stockholm	1	1				2
224 Stockholm	1	1				2
225 Stockholm	1	1				2
226 Stockholm		1				1
227 Stockholm	1					1
228 Stockholm	2					2
229 Stockholm	3					3
230 Stockholm	2					2
Operational support	1	2	2	1	1	7
Total	18	12	2	1	1	34

Copenhagen ACC

Sector name	Executive	Planner	FDO	FMP	Support	Total
231 Copenhagen	1	1				2
232 Copenhagen	1	1				2
233 Copenhagen	1	1				2
234 Copenhagen	1	1				2
235 Copenhagen	1	1				2
236 Copenhagen	1	1				2
237 Copenhagen	1	1				2
238 Copenhagen	1	1				2
239 Copenhagen	1	1				2
240 Copenhagen	1					1
241 Copenhagen	2					2
242 Copenhagen	2					2
243 Copenhagen	2					2
244 Copenhagen	1					1
245 Copenhagen	1					1
246 Copenhagen		2				2
Operational support	3	3	3	1	4	14
Total	21	14	3	1	4	43

8 Alliance Scenario

8.1 General

Alliance Scenario is a virtual possibility including the use of the three Control Centres and the airspace, with a joint data distribution/sharing et al.

In this scenario as many sectors, from Merger scenario, as possible, have been used, some sectors have been modified and a few sectors as of today have been used. Sectors that can be used without any change from merger scenario an A (for **A**lliance) has been added in the start of the sector naming, sectors that has been modified will have a M (for **M**odified) added at the end of the sector naming, finally present sectors used will start with 3 (for scenario **3**) in the sector naming.
This has been done in order to show the origin of the sector.

In this scenario it is a prerequisite for creation of cross-border sectors, that the airspace in question has the same airspace classification, as the airspace in Alliance Scenario is identical to existing airspace and not yet harmonised.
According to the airspace classification of today, this will enable cross-border sectors in the airspace above FL 195, where relevant.

Cross-border sectors can be placed either at LFV or Naviair, and will not necessarily have to be placed as described in this scenario.

8.2 Military positions

The relevance of military positions for the business case is not specifically covered in the Terms of Reference and is described here in order to cover all working entities of the control centres. The following has been basis for the case study:

Swedish military positions will be dedicated to Swedish Military, for handling military traffic in Swedish airspace.

Danish military positions will be dedicated to Danish Military, for handling military traffic in Danish airspace.

For handling military traffic in Swedish and Danish FIR, following positions will be established.

Swedish Military Alliance Scenario:

Mil Malmö:
Assigned Swedish airspace 3 executive

Mil Stockholm:
Assigned Swedish airspace 3 executive

Danish Military Alliance Scenario:

RG:
Danish FIR 1 executive and 1 planner

RM:
Danish FIR 1 executive and 1 planner

RU:
Danish FIR 1 executive and 1 planner

MDS:
Danish FIR 1 FDO position

8.3 LFV

8.3.1 Area of Responsibility

The area of responsibility is the area as in Stockholm FIR and Malmö FIR, with the exception of the areas concerned in cross-border sectors.

8.3.2 En Route sectors and positions

Sector A101 LFV:
GND – FL 460 1 executive and 1 planner

Sector A101 is almost similar to ESOS sector K with an extension north of sector A102 from Norwegian borderline to the Finnish borderline.

Sector A101 will be handling:

- Traffic to and from a number of airports in the area: Kiruna, Gällivare, Vidsel, Luleå, Arvidsjaur, Skellefteå, and a number of small airports.
- Transit traffic to/from Finland and Far East to/from North America.
- Transit Norwegian domestic traffic to/from northern part of Norway.
- OAT flights in training area.

Sector A102 LFV:
GND – FL 460 1 executive and 1 planner

Sector A102 is almost similar to ESOS sector F with an extension north of sector A103 from Norwegian borderline to the Finnish borderline.

Sector A102 will be handling:

- Traffic to and from a number of airports in the area: Östersund, Örnsköldsvik, Kramfors, Sundsvall, Sveg.
- Traffic to/from Stockholm TMA.
- Transit traffic to/from Finland and Far East to/from North America.
- Transit Norwegian domestic traffic to/from Oslo TMA to/from Northern part of Norway.

Sector A103 LFV:
GND – FL 460 1 executive and 1 planner

The extension of A103 covers the area from the Norwegian borderline crossing Mid-Sweden to the Finnish borderline.

Sector A103 will be handling:

- Traffic to and from a number of airports in the area: Karlstad, Borlänge, Mora.
- Traffic to/from Stockholm TMA.
- Traffic to/from Oslo TMA.
- Transit traffic to/from Finland.
- Crossing traffic overhead Stockholm TMA.

Sector A104 LFV:
FL 285 – FL 460 1 executive and 1 planner

Sector A104 is similar to present ESMM sector W.

Sector A104 will be handling:

- Traffic to and from Stockholm Airports.
- Transit traffic from Finland and the Far East.
- Initial spacing for arriving traffic Stockholm/Arlanda.

Sector A105 LFV:
FL 285 – FL 460 1 executive and 1 planner

Sector A105 is a sector in Swedish airspace established due to increased traffic on tracks from southeast to the northwest v.v. that is conflicting with traffic on tracks from southwest to northeast v.v.
It covers the Baltic Sea area and the Island of Gotland up to the border to Finland.

Sector A105 will be handling:

- Transit traffic to and from Finland and further eastbound.
- Inbound/outbound traffic to Stockholm airports.
- Crossing traffic southeast – northwest v.v. and traffic southwest – northeast v.v.

Sector A106M LFV:
GND – FL 285 1 executive and 1 planner

Sector A106M is similar to today's ESMM sector 5 slightly moved to the northeast, covering the area from the Swedish west coast up to Feeder Stacker sectors in Stockholm TRACON.

In Alliance scenario sector A106M has been adjusted towards west to the FIR boundary between Sweden and Denmark.

Sector A106M will be handling:

- Gothenburg traffic coming from/departing east/northeast bound.
- Coordination to Såtenäs TMC for handling of OAT flights.
- Traffic to and from Örebro, to and from Karlstad.

Sector A107 LFV:
FL 285 – FL 460 1 executive and 1 planner

The extension of sector A107 is from the Swedish west coast to the west up to Stockholm TMA. In the northwest the sector will follow the Swedish/Norwegian borderline.

Sector A107 will be handling:

- Traffic to and from Stockholm Airports
- Transit traffic to/from Finland and the Far East.
- Two crossing tracks for Oslo traffic to/from the southeast.
- Initial spacing for arriving traffic Stockholm/Arlanda.

Sector A108 LFV:
GND – FL 285 1 executive and 1 planner

This sector will enclose the airspace between Stockholm and Copenhagen TRACON sectors. The extension of sector 108 is from the Swedish west coast (Göteborg TMA) to the Swedish east coast.

Sector A108 will be handling:

- Traffic to and from airports in the area: Jönköping, Växjö, Linköping, Skavsta, Ronneby, Kalmar and Visby.
- Coordination to Ronneby TMC for handling of OAT flights.
- OAT training flights to training areas will be handled via this sector.

Sector A109 LFV:
FL 285 – FL 460 1 executive and 1 planner

Sector A109 is almost similar to today's ESMM sector 2, with an extension towards west in to Danish airspace.

Sector A109 will be handling:

- Traffic to and from Stockholm Airports.
- Transit traffic from Finland/Far East.
- Traffic between TRACON Copenhagen/Skaane and TRACON Stockholm.
- Two crossing tracks for Göteborg/Oslo traffic to the southeast.

Sector A110 LFV:
GND – FL 345 1 executive and 1 planner

The extension of sector 110 is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a mix of today's ESMM sector 7 and 8 but not including the area over Ronneby/Kalmar below FL285.

Sector A110 will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

Sector A111 LFV:
FL 345 – FL 460 1 executive and 1 planner

The extension of sector A111 is the very southeast part of Sweden and overhead the Baltic Sea area. This sector is a combination of parts of today's ESMM sector 6 and 9.

Sector A111 will be handling:

- Transit traffic between Western Europe and Eastern Europe/Far East.
- A number of crossing points for traffic from southeast to northwest v.v.

Sector A126 LFV:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 2.

Sector A126 will be handling:

- Outbound and inbound traffic to Bromma and Arlanda via TRS

Sector A127 LFV:
GND – FL 285 1 executive and 1 planner

Sector A127 will be handling:

- Arriving traffic to Arlanda and Bromma via HMR.
- Departing traffic from Arlanda and Bromma via RESNA.

Sector A128 LFV:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 6.

Sector A128 will be handling:

- Arriving traffic to Arlanda and Bromma via XILAN
- Departing traffic from Arlanda via NTL and BABAP
- Departing traffic from Bromma via NTL and ALOLA

Sector A129 LFV:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 7.

Sector A129 will be handling:

- Arriving traffic to Bromma via TINKA.
- Departing traffic from Arlanda and Bromma via NOSLI and DKR

Sector A130 LFV:
GND – FL 285 1 executive and 1 planner

Similar extension as ESOS sector 8.

Sector A130 will be handling:

- Arriving traffic to Arlanda via ELTOK
- Arriving traffic to Bromma via ARS
- Departing traffic from Arlanda via KOGAV and ARS
- Departing traffic from Bromma via ARS

Sector A138M LFV:
GND – FL 285 1 executive and 1 planner

Sector A138M is similar to today's ESMM sector 1 slightly restricted to the north-east and West, covering the area from the Swedish west coast up to Sector A107 and Sector A108.

In Alliance scenario sector A138M has been modified towards west to follow the FIR boundary along sector A116M and sector A144M.

Sector A138M will primary be handling:

- Arriving traffic to EKCH via KULLE[9]

Sector A139 LFV:
GND – FL 285 1 executive and 1 planner

Sector A139 is similar to today's ESMM sector 3 slightly restricted to the north-east, covering the central part of southern Sweden up to Sector A108.

Sector A139 will be handling:

- Arriving traffic to ESMS via KEMAX
- Departing traffic from EKCH and ESMS via ASTOS, KEMAX, PERRY and NEXIL.

Sector A140M LFV:
GND – FL 285 1 executive and 1 planner

Sector A140M is similar to today's ESMM sector S slightly restricted to the East, covering the area from the Swedish South coast up to Sector A139 and Sector A108.

In Alliance scenario sector A140M has been modified towards west to follow the FIR boundary along sector A141M, as it is today.

Sector A140M will be handling:

- Arriving traffic to EKCH and ESMS via ELVIX[10] and KOTAM
- Departing traffic from EKCH and ESMS via SIMEG and BALOX departures.

8.3.3 APP sectors and positions

Sector A121 LFV:
Stockholm Approach 1 planner

Responsible for co-ordination within Stockholm TMA, for inbound and outbound traffic to Arlanda and Bromma.

[9] KULLE is a fictitious point, which in the Skaane Feasibility Phase Report replaces SVD VOR as inbound fix.
[10] ELVIX replaces in the Skaane Feasibility Phase Report ALM VOR as inbound fix.

The APPCO shall handle the regulation of traffic to the approach area, primarily in peak hours. With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area of overloading. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where APPCO support is appropriate

Sector A122 LFV:
Not determined 1 executive

Responsible for the monitoring of independent approaches and departures on RWY 01L/ 01R and 19L/19R at Arlanda.

Sector A123 LFV:
GND – FL 195 2 executive

Main sector for inbound traffic to Arlanda.

Sector A123 will be handling:

- Arr-123 responsible for sector A123
- Dir-123 handles inbound traffic to Arlanda within sector A123

Sector A124 LFV:
GND – FL 195 3 executive

Main sector for outbound traffic from Arlanda.

Sector A124 will be handling:

- Arr-124 responsible for sector A124
- Dir-124 handles inbound traffic to Arlanda within sector A124
- Dep-124 handles outbound traffic from Arlanda within sector A124

Sector A125 LFV:
GND – FL105 2 executive

Main sector for traffic to/from Bromma.

Sector A125 will be handling:

- APP-125 responsible for sector A125
- Dir-125 handles inbound traffic to Bromma within sector A125

Sector 313 LFV:
GND – FL 4.5/65/95/155 2 executive

Sector 313 is similar to ESMM sector M.

Sector 313 will be handling:

Sector ESMM M will be handling:

- Arriving/Departing traffic Malmö/Sturup
- Handling of VFR traffic in the area

8.3.4 Support positions Malmö

Operational support

- 2 x SUP
- 1 x FMP[11]
- 2 x FDO
- 1 x TECH SUP

Other
Following positions/operator roles are not included in the overall count concerning positions.

- 1 x FIGARO
- 1 x WSS

8.3.5 Support positions Stockholm

Operational support

- 1 x SUP
- 2 x TAC SUP
- 1 x FMP[12]
- 2 x FDO
- 1 x TECH SUP

Other
Following positions/operator roles are not included in the overall count concerning positions.

- 1 x WSS

8.4 NAVIAIR

8.4.1 Area of Responsibility

Danish airspace is divided in to several sectors, in order to handle the En Route traffic and part of the traffic to and from EKCH.
As the implementation of DATMAS is scheduled to be the 25th of December 2007, the number of positions will be defined as planned in the future DATMAS environment.

[11] Operator role (no E2kE position)
[12] Operator role (no E2kE position)

8.4.2 En Route sectors and positions

To the En Route sectors, 3 sector co-ordinator positions are attached.

Sector A112 NAVIAIR:
FL 285 – FL 345 1 executive and 1 planner

Sector A112 is crossing today's FIR boundary and covering Southern part of Sweden, Eastern part of Sjaelland, Lolland and Falster.

Sector A112 will be handling traffic:

- From Copenhagen and Sturup, coming from sector A141M bound for UACC Maastricht.
- Transiting from one adjacent sector to another at cruising FL.

Sector A113 NAVIAIR:
FL 345 – FL 660 1 executive and 1 planner

Sector A113 lateral extension is similar to Sector A112.

Sector A113 will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL.

Sector A114 NAVIAIR:
FL 285 – FL 345 1 executive and 1 planner

Sector A114 is almost similar to today's EKDK sector C, covering south-eastern part of Jutland, Fyn and Western part of Sjaelland.

Sector A114 will be handling traffic:

- Inbound Copenhagen coming from UACC Maastricht and Sector A119.
- From Copenhagen, coming from sector A143, bound for UACC Maastricht or sector A120.
- Transiting from one adjacent sector to another at cruising FL.

Sector A115 NAVIAIR:
FL 345 – FL 660 1 executive and 1 planner

Sector A115 lateral extension is similar to sector A114.

Sector A115 will be handling traffic:

- From Copenhagen, coming from sector A114 bound for UACC Maastricht or the North Sea.
- Transiting from one adjacent sector to another at cruising FL.

Sector A116M NAVIAIR:

GND – FL 285 1 executive and 1 planner

Sector A116M is almost similar to today's EKDK sector L, covering the area north of a line from Jutland's West Coast, via Billund, Århus and up to the Danish/Swedish border at Göteborg.

In Alliance Scenario sector A116M will be modified towards west along the FIR boundary between Sweden and Denmark.

Sector A116M will be handling traffic:

- To and from Aalborg, to and from Billund/Århus bound for destinations north of Billund.
- To and from Göteborg, coming from/departing to west/southwest.
- Inbound Copenhagen and Göteborg coming from Norway and sector A117.
- From Copenhagen, coming from sector A144M, bound for Norway or the Atlantic.

Sector A117 NAVIAIR:
FL 285 – FL 345 1 executive and 1 planner

Sector A117 is similar to today's EKDK sector V, covering the same area as described for sector 116, except for the adjustment towards east, as sector A117 will follow the Danish/Swedish borderline.

Sector A117 is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.
- Traffic to and from Copenhagen and Göteborg.

Sector A118 NAVIAIR:
FL 345 – FL 660 1 executive and 1 planner

Sector A118 is similar to today's EKDK sector 4, covering the same area as described for sector A117.

Sector A118 is handling:

- Transit traffic to and from Finland, Sweden and Norway from one adjacent sector to another.
- Traffic to and from Copenhagen and Göteborg.

Sector A119 NAVIAIR:
GND – FL 660 1 executive and 1 planner

Sector A119 is almost similar to today's EKDK sector S, covering the area from Billund and south/southwest to the German border.
In Merger Scenario sector A119 eastern border (along sector A114 /A115) has been moved a bit towards west.

Sector A119 will be handling traffic:

- Transiting from one adjacent sector to another at cruising FL, with the main objective to ensure a safe cross for high-level transit traffic going east/west and north/south meeting overhead Esbjerg.

- To and from Billund coming from/departing to west/southwest.

Sector A120 NAVIAIR:
FL 85 – FL 660 1 executive and 1 planner

The extension of sector A120 is the same as it is for the EKDK sector N today, handling traffic in the North Sea west of Jutland.

Today a sector F is defined in the North Sea from GND – FL 85 handling mostly helicopter offshore traffic and operated by Copenhagen Information.

Sector A120 will be handling:

- High-level transit traffic above FL 285 from one adjacent sector to another at cruising FL.

Sector A141M NAVIAIR:
GND – FL 285 1 executive and 1 planner

Sector A141M is similar to today's EKDK sector B, covering the south-eastern part of Danish FIR between Sector A140M and Sector A142.

In Alliance scenario sector A141M has been modified towards west to follow the FIR boundary along sector A140M, as it is today.

Sector A141M will be handling:

- Arriving traffic to EKCH and ESMS via CDA.

- Departing traffic from EKCH and ESMS via SALLO.

Sector A142 NAVIAIR:
GND – FL 285 1 executive and 1 planner

Sector A142 is similar to today's EKDK sector I, covering the area south of the APP area to the German border between Sector A141M and Sector A143.

Sector A142 will be handling:

- Departing traffic from EKCH and ESMS via BISTA, MAXEL and TOBIS

Sector A143 NAVIAIR:
GND – FL 285 1 executive and 1 planner

Sector A143 is similar to today's EKDK sector D, covering the area west of the APP-area between Sector A141M and Sector A144M.

Sector A143 will be handling:

- Arriving traffic to EKCH via LUGAS.
- Departing traffic from EKCH and ESMS via DOBEL.

Sector A144M NAVIAIR:
GND – FL 285 1 executive and 1 planner

Sector A144M is similar to today's EKDK sector E, covering the area north-west of the APP-area between Sector A143, Sector A116M and Sector A138M.

In Alliance scenario sector A144M has been modified towards west to follow the FIR boundary along sector A138M.

Sector A144M will be handling:

- Arriving traffic to EKCH via ROSBI
- Departing traffic from EKCH and ESMS via SORGA, MIRGO and NOA

8.4.3 APP sectors and positions

The proposed solution for the approach area, shown in MAP 10, is identical to existing (2006) airspace. The area is divided into 2 separate departure/approach sectors in this scenario named sector 341 NAVIAIR and 342 NAVIAIR. Each sector consists of 2 positions, one for departing and one for approaching traffic.

Today only one APPCO position exists, but in order to meet the DATMAS configuration 2 APPCOs are counted for in the following. Including the final position a total of 7 positions are required in the proposed Alliance Scenario.

Sector 341 NAVIAIR:
GND to FL 195 2 executive (Departure/Approach 341 NAVIAIR)

Departure 341 will be handling:

- Outbound traffic from Kastrup and some traffic to/from Roskilde towards west.
- Traffic transiting sector 341.

Approach 341 will be handling:

- Traffic transiting sector 341 inbound for Kastrup.

Sector 342 NAVIAIR:
GND to FL 195 2 executive (Departure/Approach 342)

Departure 342 will be handling:

- Handles outbound traffic from Kastrup and some traffic to/from Roskilde mostly towards east.
- Traffic transiting sector 342.

Approach 342 will be handling:

- Traffic transiting sector 342 inbound for Kastrup.

Sector 343 NAVIAIR:
GND to FL 65 1 executive

Final 343 will be handling:

Handles traffic from Approach 341 and Approach 342 inbound to Kastrup.

Sector 344 NAVIAIR:
Copenhagen Approach coordinator: 2 planner

APPCO: The Approach Co-ordinator is a control position with the general responsibility for the co-ordination and flight clearances between the approach sectors and adjacent sectors, including the towers at Roskilde and Kastrup airports.

The APPCO shall handle the regulation of traffic to the approach area, primarily during peak hours. With assistance from the Sequencing and Metering (S&M) system, the APPCO shall prevent the sectors in the approach area of overloading. Furthermore, the APPCO shall support the approach sectors during irregular situations as well as in other situations where APPCO support is appropriate.

8.4.4 Support positions Copenhagen

Operational support

- 2 x SUP
- 1 x FMP
- 3 x FDO
- 3 x COOR
- 1 x TECH SUP
- 4 x COIF

Other
Following positions are not included in the overall count concerning positions.

- 1 X DATMAS TECH
- 1 x ATM
- 1 x COM
- 1 x CANDI
- 1 x CACOM
- 1 x CNS Building

8.5 Summary of sectors and positions Alliance Scenario

	Military					
Sector name	**Executive**	**Planner**	**FDO**	**FMP**	**Support**	**Total**
Swedish Military scenario 3	6					6
Danish Military scenario 3	3	3	1			7
Total	9	3	1			13

LFV

Sector name	Executive	Planner	FDO	FMP	Support	Total
A101 LFV	1	1				2
A102 LFV	1	1				2
A103 LFV	1	1				2
A104 LFV	1	1				2
A105 LFV	1	1				2
A106M LFV	1	1				2
A107 LFV	1	1				2
A108 LFV	1	1				2
A109 LFV	1	1				2
A110 LFV	1	1				2
A111 LFV	1	1				2
A126 LFV	1	1				2
A127 LFV	1	1				2
A128LFV	1	1				2
A129 LFV	1	1				2
A130 LFV	1	1				2
A138M LFV	1	1				2
A139 LFV	1	1				2
A140M LFV	1	1				2
A121 LFV		1				1
A122 LFV	1					1
A123 LFV	2					2
A124 LFV	3					3
A125 LFV	2					2
313 LFV	2					2
Operational support	2	3	4	2	2	13
Total	31	23	4	2	2	62

NAVIAIR

Sector name	Executive	Planner	FDO	FMP	Support	Total
A112 NAVIAIR	1	1				2
A113 NAVIAIR	1	1				2
A114 NAVIAIR	1	1				2
A115 NAVIAIR	1	1				2
A116M NAVIAIR	1	1				2
A117 NAVIAIR	1	1				2
A118 NAVIAIR	1	1				2
A119 NAVIAIR	1	1				2
A120 NAVIAIR	1	1				2
A141M NAVIAIR	1	1				2
A142 NAVIAIR	1	1				2
A143 NAVIAIR	1	1				2
A144M NAVIAIR	1	1				2
341 NAVIAIR	2					2
342 NAVIAIR	2					2
343 NAVIAIR	1					1
344 NAVIAIR		2				2
Operational support	3	3	3	1	4	14
Total	21	18	3	1	4	47

9 Summary of working positions

Reference concerning the below figured is made in chapter 1.3 in the beginning of this document and thus the summarized figures for Merger Scenario in this chapter can be adjusted over the three centres as appropriate.

Merger Scenario

Scenario 1	Executive	Planner	FDO	FMP	Support	Total
3 Centres	53	40	7	1	6	107
Total civil	53	40	7	1	6	**107**
Swedish military	4					4
Danish military	3	3	1			7
Total	60	43	8	1	6	**118**

NUAC/Skaane Scenario

Scenario 2	Executive	Planner	FDO	FMP	Support	Total
Malmö	17	17	2		1	37
Stockholm	18	12	2	1	1	34
Copenhagen	21	14	3	1	4	43
Total civil	56	43	7	2	6	**114**
Swedish military	4					4
Danish military	3	3	1			7
Total	63	46	8	2	6	**125**

Alliance Scenario

Scenario 3	Executive	Planner	FDO	FMP	Support	Total
LFV	31	23	4	2	2	62
NAVIAIR	21	18	3	1	4	47
Total civil	52	41	7	3	6	**109**
Swedish military	6					6
Danish military	3	3	1			7
Total	61	44	8	3	6	**122**

10 Conclusion

It is the Business cases and the CBA's that will provide the overall conclusions of costs and benefits of the study made in this and other reports and thus the study has refrained from concluding in a manner that could influence the work on these documents.

However, all three case scenarios would be possible solutions for developing a de facto usable airspace design via validation through simulations and regulation and should be regarded as such in the development of the Business Cases et al.

It must be noted that the high level status of this document has taken an overall view of the feasible number of sectors and positions and although some positions that are presently duplicated in the three centres has been reduced in scenario one and accounts for the reduced number of sectors in this scenario compared to the other scenarios. It is possible, that further and more in depth studies that will be conducted in a Development Phase will be able to show further optimisation of positions and sectors in primarily Merger Scenario and the Alliance Scenario.

A brief conclusion for each scenario is described in the chapters below.

10.1 Merger scenario

A harmonisation of airspace classification in Swedish and Danish airspace has to take place, in order to ensure the full benefit of the design in the Merger scenario.

Regulators will only have to work with one provider.

Only one provider will have to be certified in the concerned airspace.

Common rules and procedures in a harmonised airspace, could lead to a safer and more efficient use of the airspace.

Approximately 140 positions will be available for the provider, in order to ensure an efficient use of both airspace and positions.

In this solution, the operation of Final Sturup is included in positions for Copenhagen TRACON.

10.2 NUAC/Skaane scenario

Traffic has developed since the work out of NUAC Phase 1 Report, which describes the airspace design used in the airspace above FL 285.

With a static division flight level in FL 285, the risk of loosing benefits of larger sectors, especially in areas with low traffic density, is very high.

The number of positions used, is the highest in this scenario.

Regulators will have to work with three providers.

Three providers will have to be certified in the concerned area.

10.3 Alliance scenario

As the 140 positions, in this scenario, no longer is a common resource, this will set up limitations in the optimum use of positions and sectors. This could result in a less efficient and flexible use of the positions and placement of sectors.

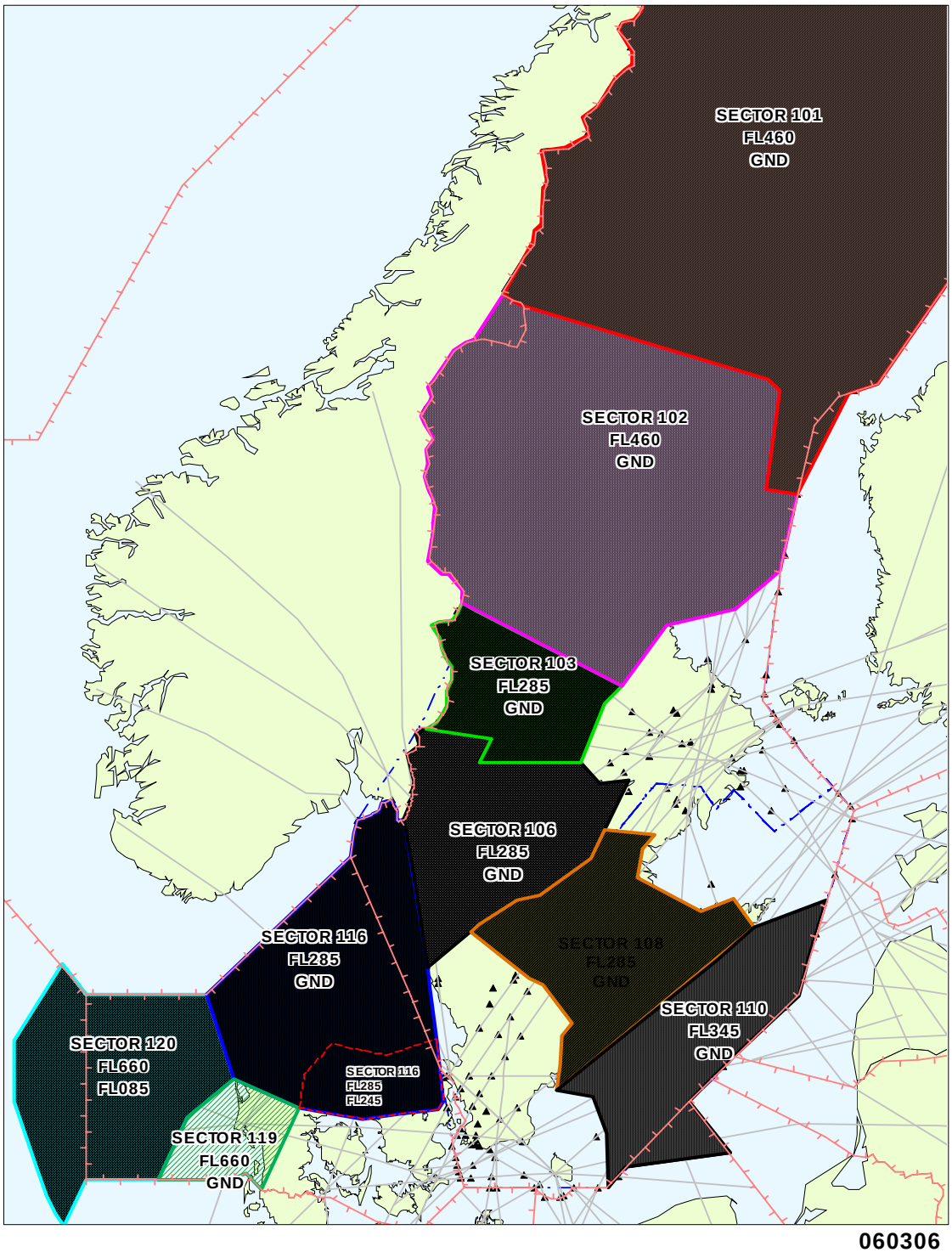
A Copenhagen TRACON as described in Merger scenario is no longer a possibility, as rules and procedures not are harmonised and the positions used for operating the airspace in Copenhagen TRACON (Merger scenario), now is divided and placed in minimum two different control centres.

Regulators will have to work with two providers.

Two providers will have to be certified in the concerned airspace.

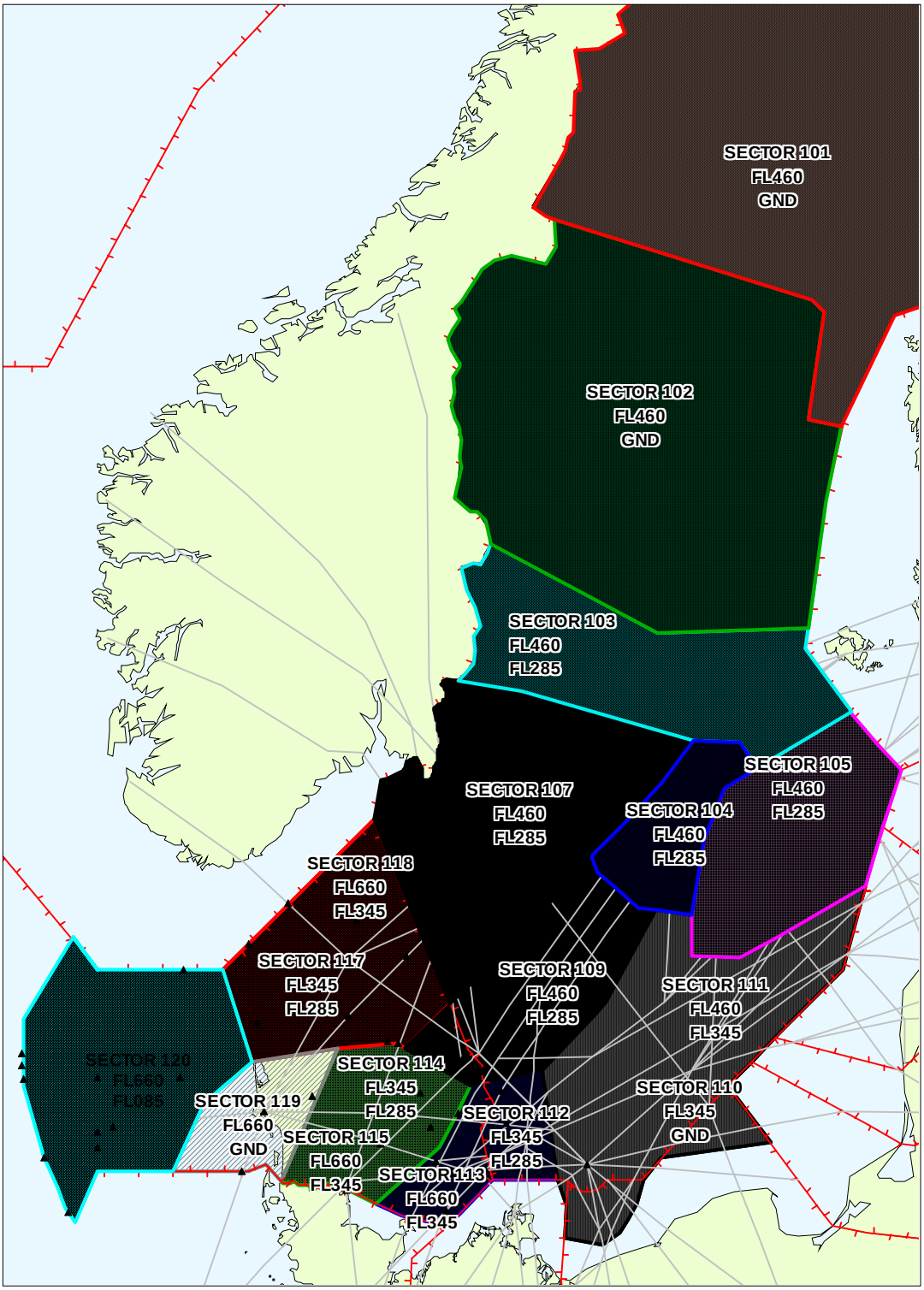
11 Maps

NUAC LOWER SECTORS ACC MERGER SCENARIO



Map 1

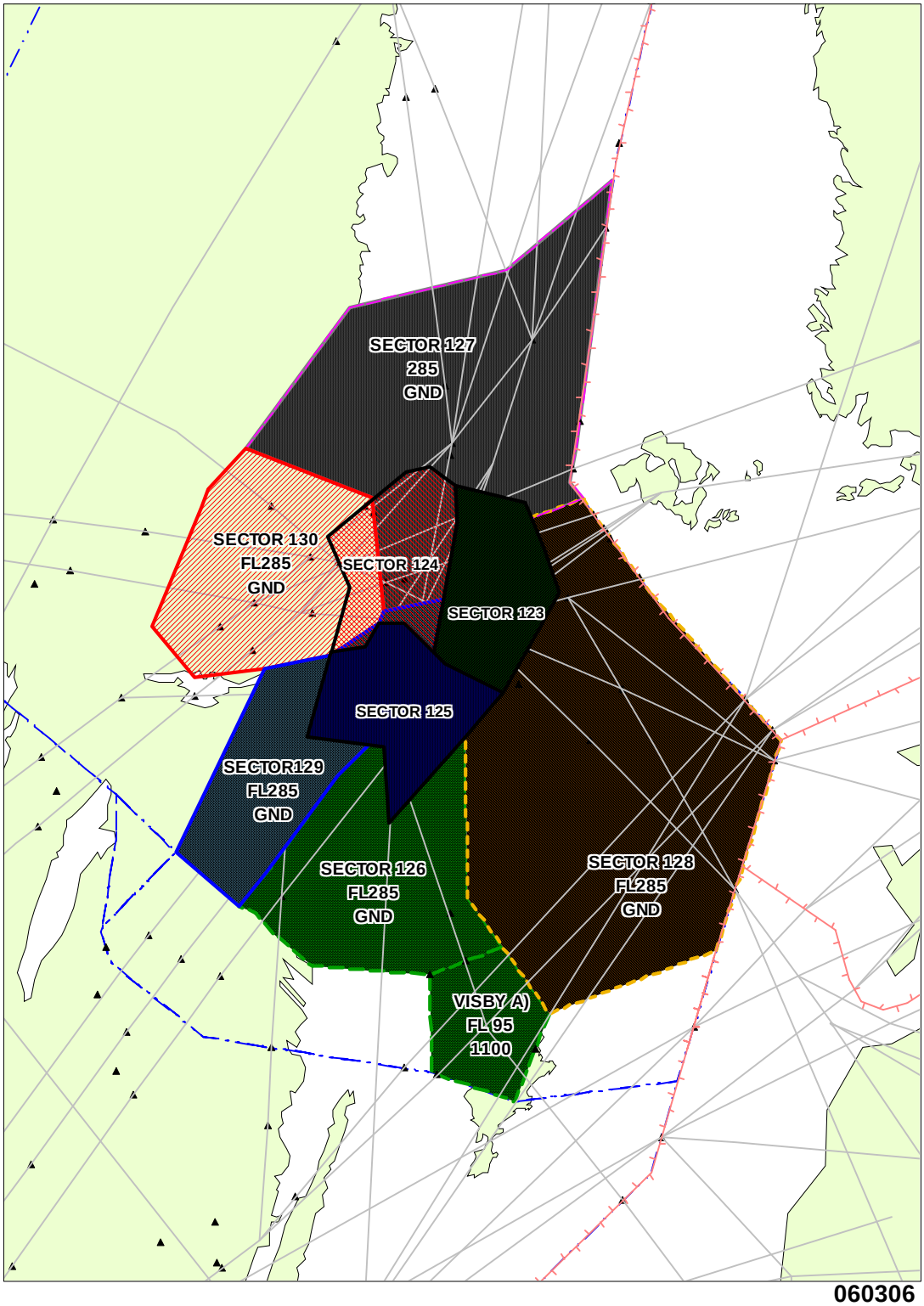
NUAC UPPER SECTORS ACC MERGER SCENARIO



060306

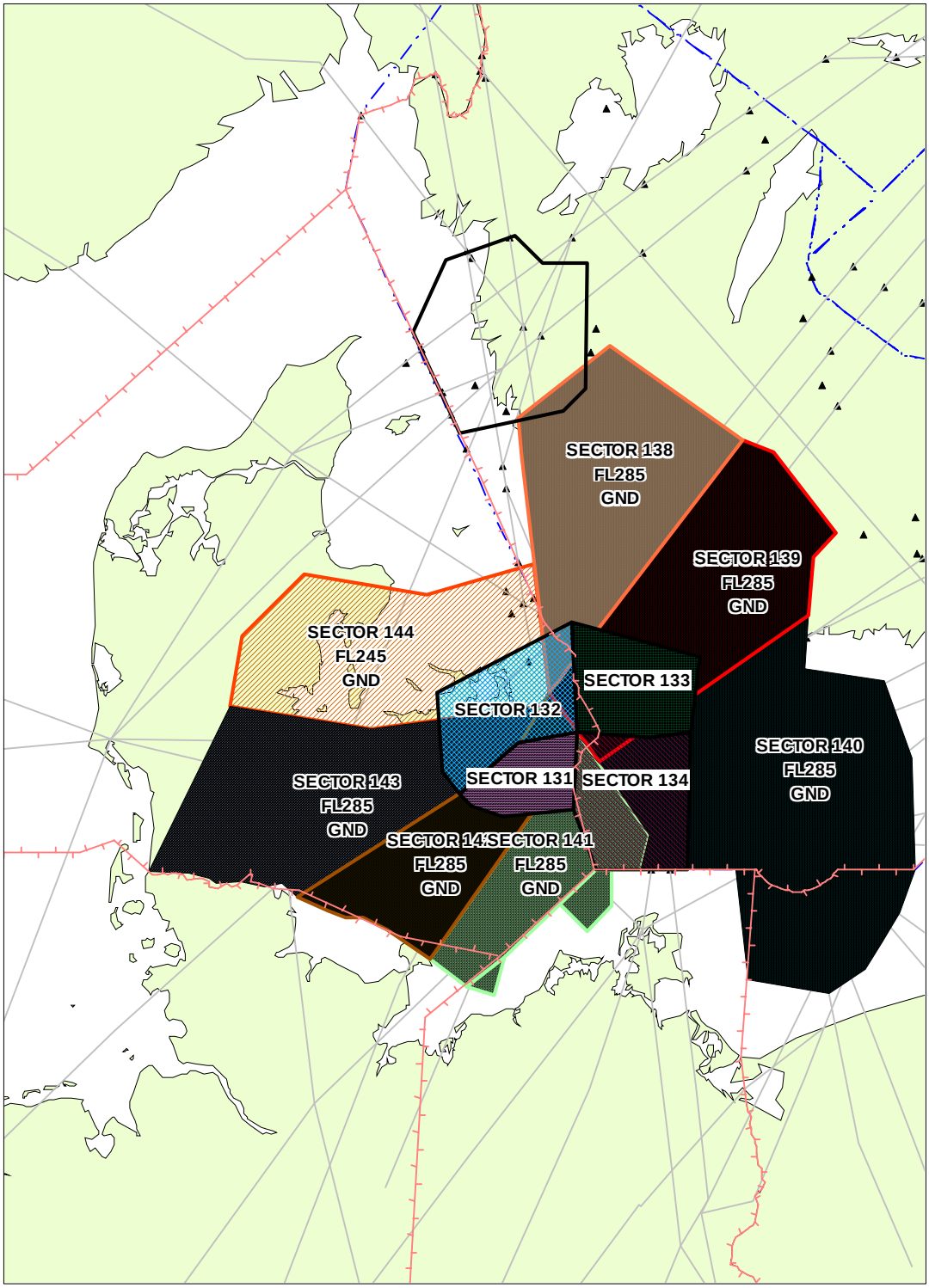
Map 2

NUAC TRACON STOCKHOLM MERGER SCENARIO



Map 3

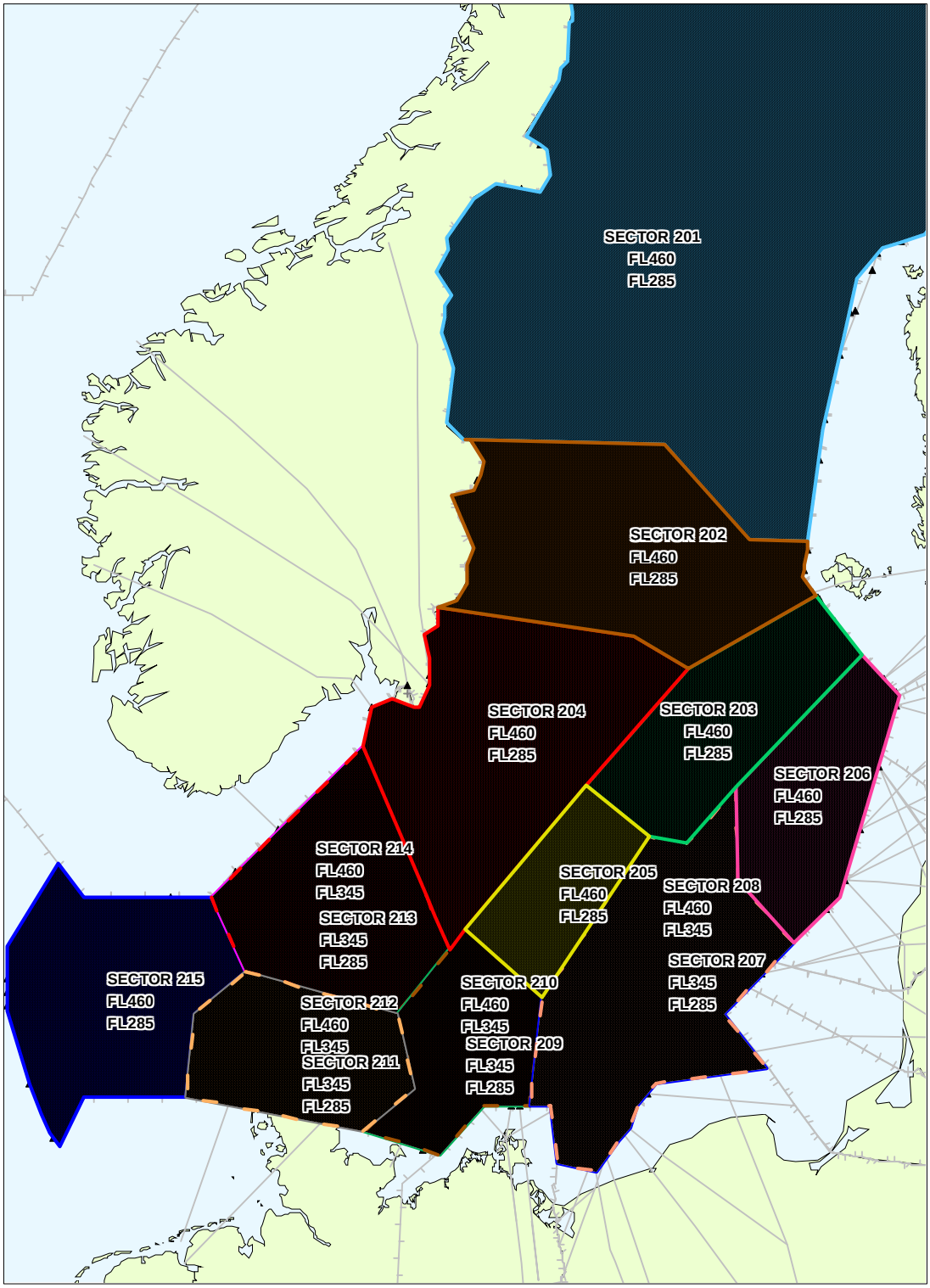
NUAC TRACON COPENHAGEN MERGER SCENARIO



060306

Map 4

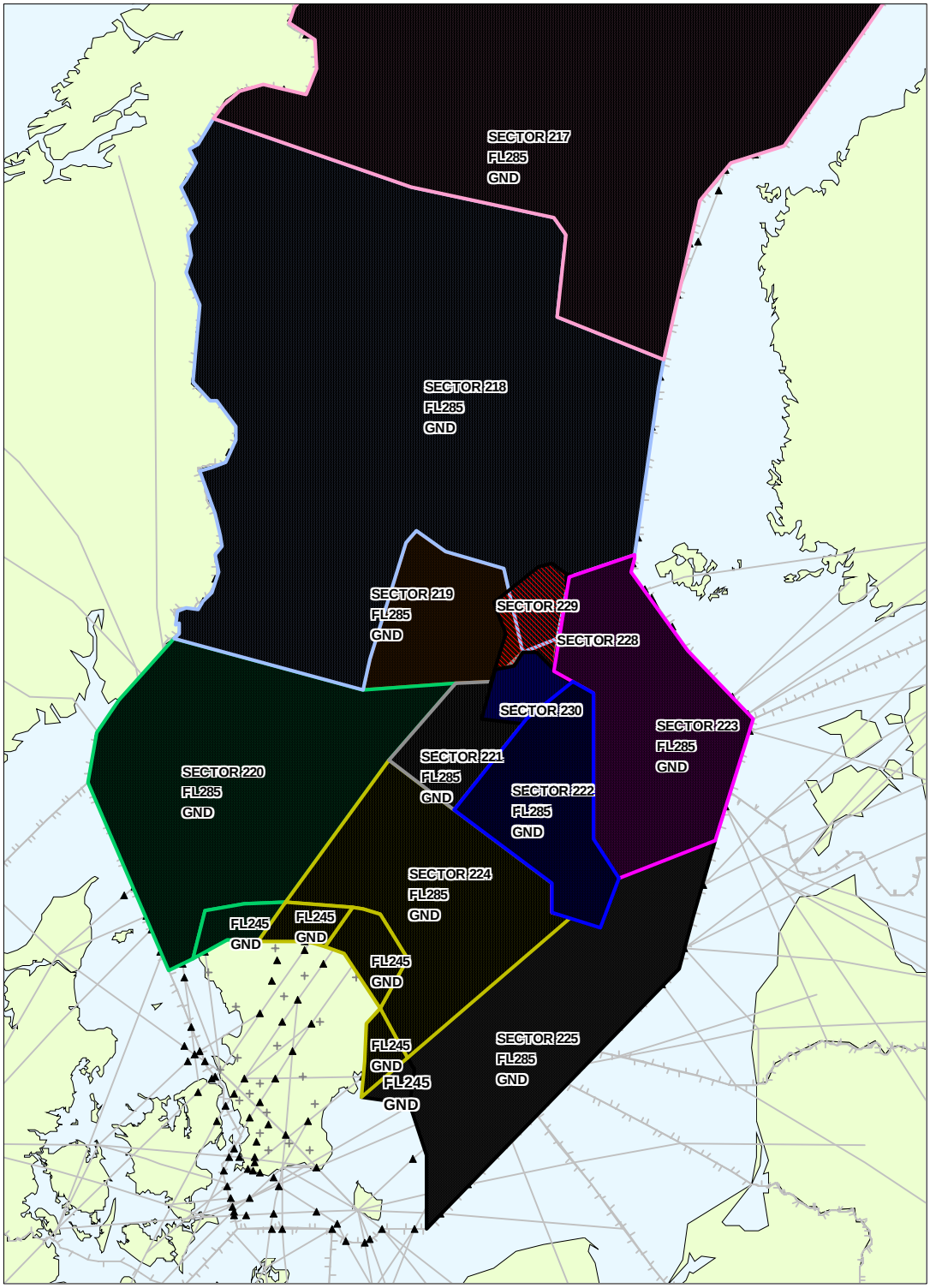
NUAC/SKAANE MALMÖ SCENARIO



060306

Map 5

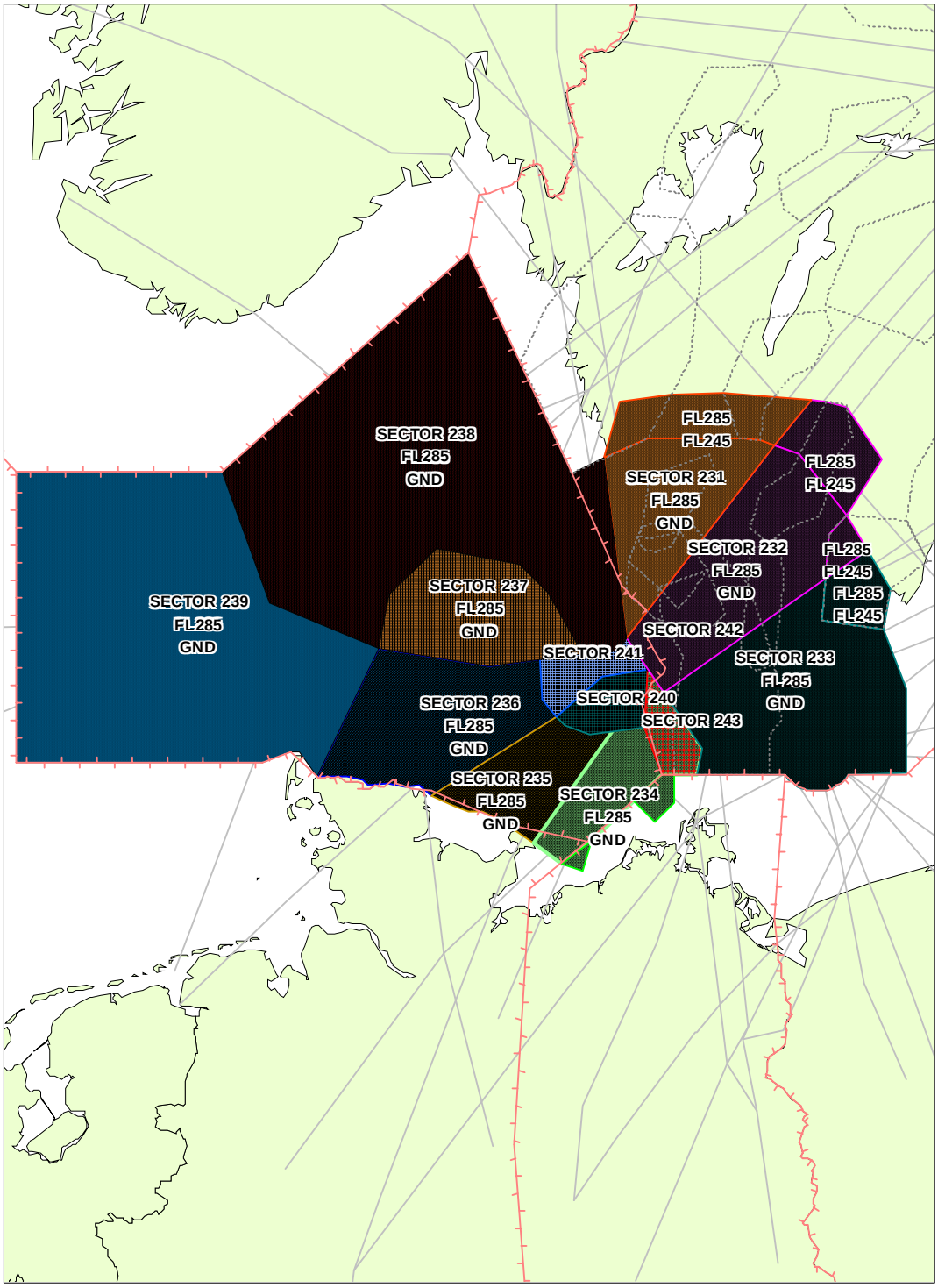
NUAC/SKAANE STOCKHOLM SCENARIO



060306

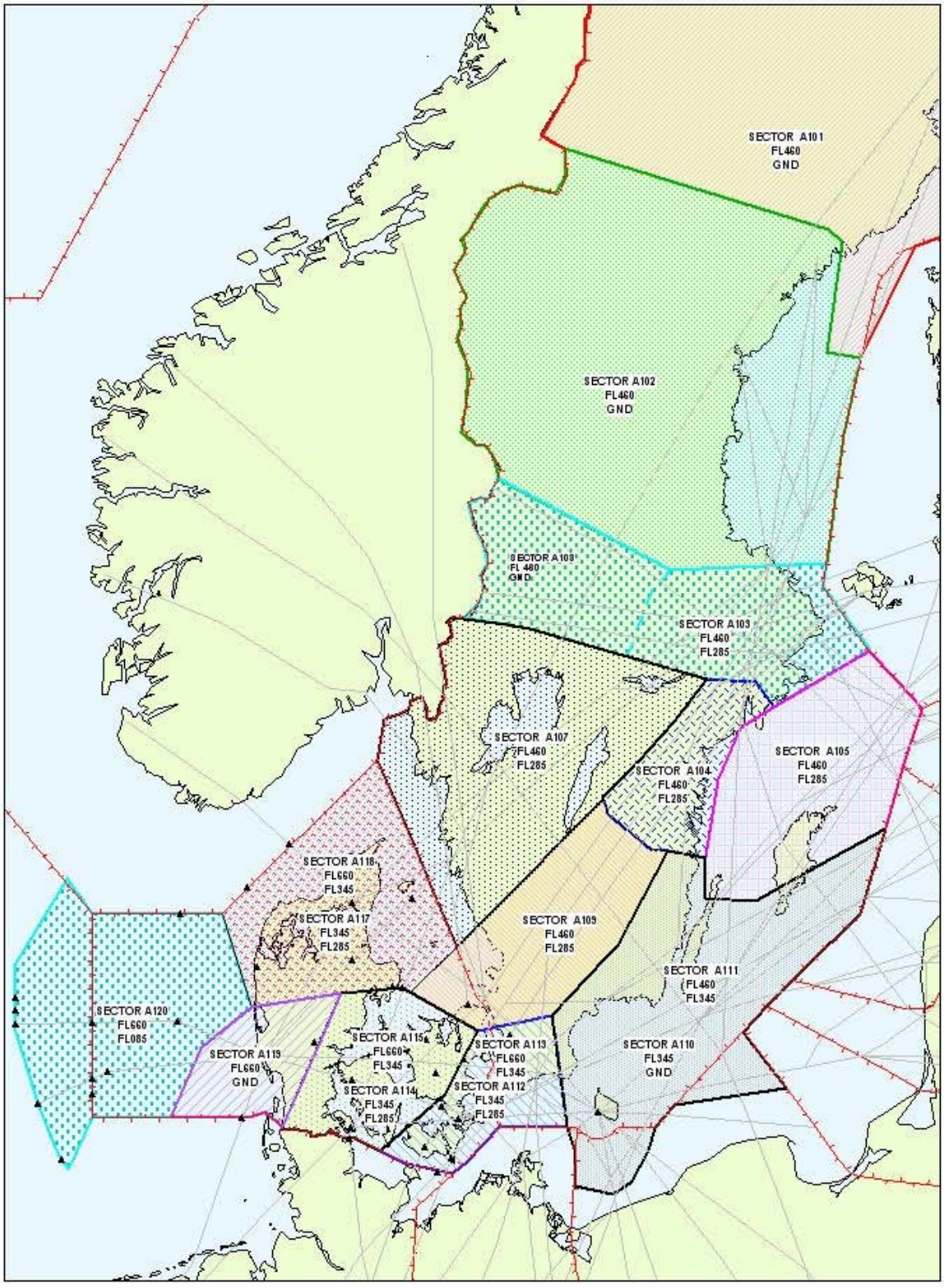
Map 6

NUAC/SKAANE COPENHAGEN SCENARIO

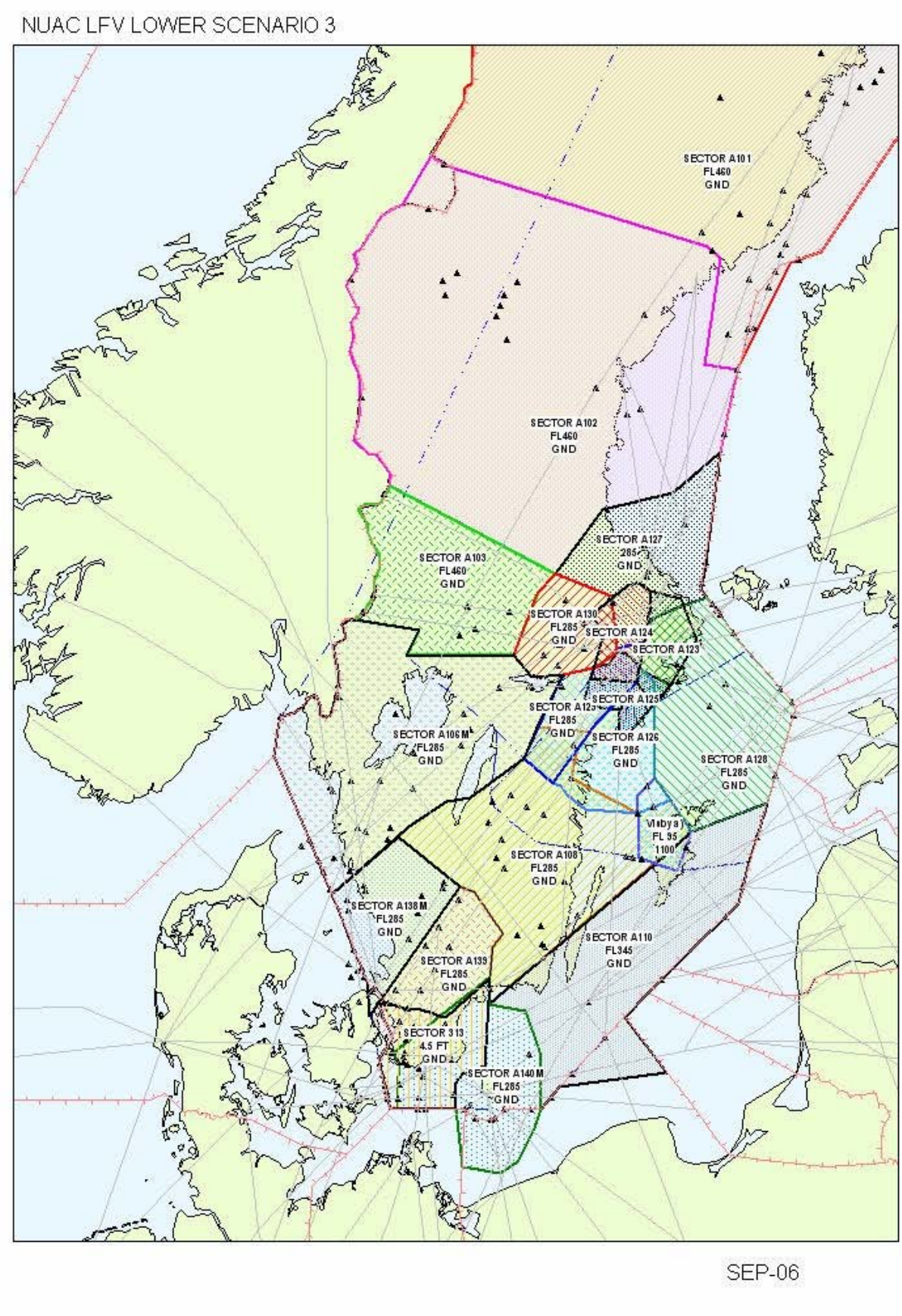


Map 7

NUAC ENROUTE UPPER SCENARIO 3

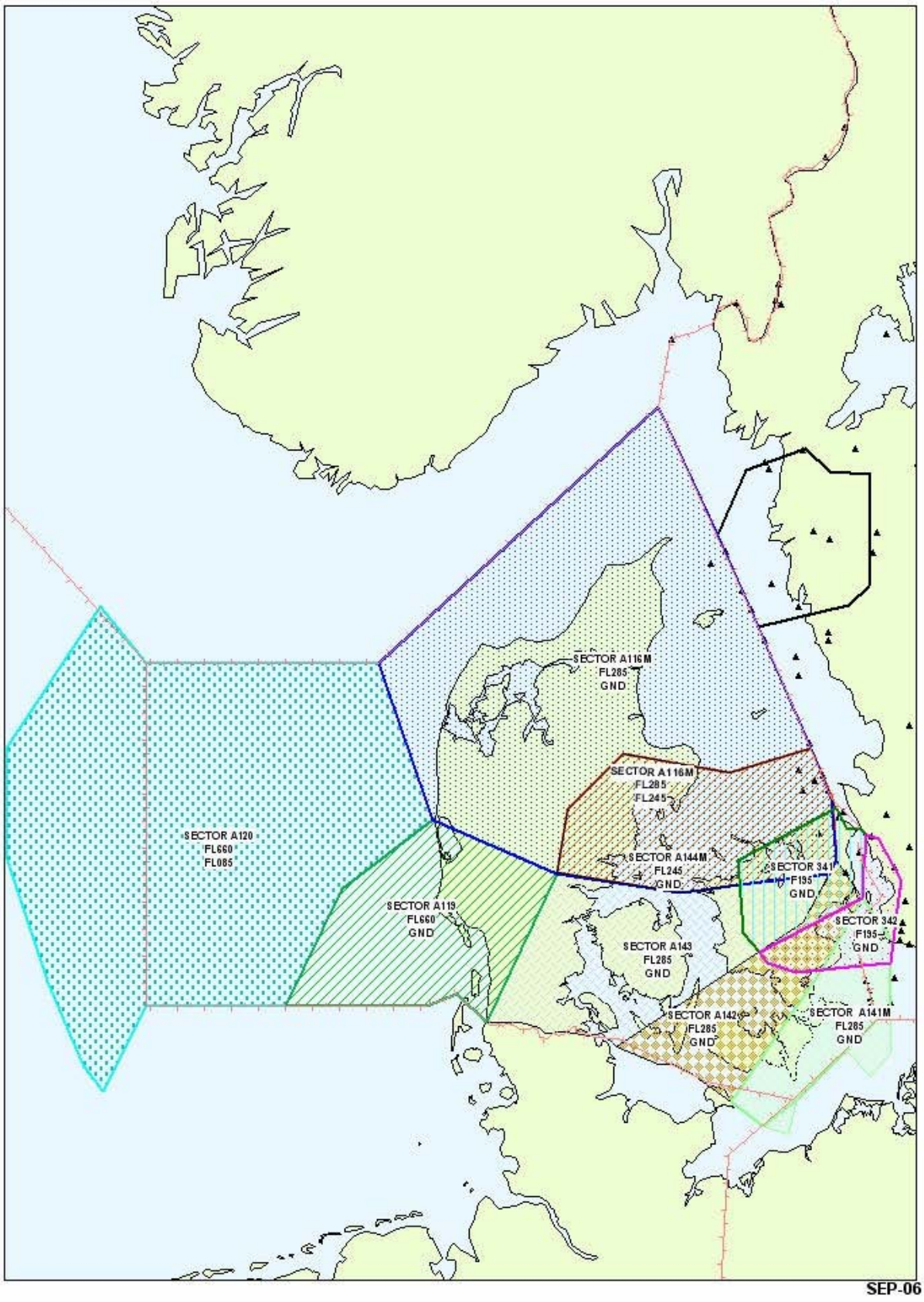


Map 8


NUAC LFV LOWER SCENARIO 3
SECTOR A101
FL460
GND
SECTOR A102
FL460
GND
SECTOR A103
FL460
GND
SECTOR A127
285
GND
SECTOR A130
FL285
GND
SECTOR A124
SECTOR A123
SECTOR A125
SECTOR A106M
FL285
GND
SECTOR A126
FL285
GND
SECTOR A128
FL285
GND
Visby 3
FL 95
1100
SECTOR A108
FL285
GND
SECTOR A138M
FL285
GND
SECTOR A110
FL345
GND
SECTOR A139
FL285
GND
SECTOR 313
4.5 FT
GND
SECTOR A140M
FL285
GND
SEP-06

Map 9

NUAC LOWER NAVIAIR SCENARIO 3



Map 10

12 Reference Documents

12.1 NUAC/Skaane Project Documents

- Skaane Project, Feasibility Phase Final Report
- Skaane Project, Operational Task Force Feasibility Phase Report - *Appendix 2*
- Skaane Project, Fast-Time Simulation Analysis – *Attachment 12 to Appendix 2*
- Skaane Project, Fast-Time Simulation Report – *Attachment 12 to Appendix 2, Annex 1*
- Skaane Project, Real-Time Simulation Report – *Attachment 13 to Appendix 2*
- Skaane Project, Technical Issues – *Appendix 3*
- Skaane Project, Consoles in CATCAS before and after implementation of Skaane step 1 –*Attachment 1 to Appendix 3*
- Skaane Project, Short Description of Service Provision ATCC Malmö (sectors 1, 3, S & M) – *Appendix 5*
- NUAC Phase 1 Report
- NUAC Phase 1 Report, Annex 4 - Sectorisation draft for the “Nordic One Sky”

12.2 Single European Sky Regulation Documents - EC and EUROCONTROL

- EUROCONTROL Final Report on European Commission’s Mandate to Support The Establishment of Functional Airspace Blocks (FAB’s)
- EUROCONTROL Final Report on European Commission’s Mandate: Draft Implementing Rules on Flexible Use of Airspace
- The Impact of fragmentation in European ATM/CNS Draft Final Report January 2006 – *Report by Solar Alliance and EUROCONTROL PRC*
- EUROCONTROL documentation of consistency between ESARR’s and ICAO Standards and Recommended Practices (ICAO SARP’s)
- EC mandate to EUROCONTROL regarding one single European Upper Information Region

12.3 ICAO Documents

- ICAO Doc. 4444
- ICAO SARP’s
- ICAO Annex 11 and 18

12.4 Other Documents

- Mediterranean Free Flight Programme, D821 MFF Final report, Edition 1, 22 November 2005. EU and TG TREN Framework. MFF Consortium (WEB: www.medtt.it)
- ADWG MFF Final Report Resume by ADWG
- FAB/FUA Oversight document by ADWG
- TRACON layout description and MAPS courtesy NATS
- TRACON layout as described by FAA on FAA website
- Implementeringsplan Sverige version 4.0

13 Definitions

Following definitions are to be considered in this report.

TRACON:	TRACON: Terminal Radar Approach CONtrol. Radar control unit handling airspace associated with tower control of one or several major airports. The airspace will be divided into feeder/stacker sectors and approach/departure sectors.
En-route control:	Radar control unit handling traffic in the airspace between TRACONS and other local tower/approach units.
Sector:	A sector is a predetermined block of airspace. A sector will exist of a number of positions.
Position:	Predetermined work related tasks. These tasks may be controlling tasks as that of an executive or planner, data processing tasks, coordinating tasks, of supervisory or technical character.
Airspace classification:	A letter indicating rules applying to specific block of airspace, including rules for IFR and VFR flights, radio communication obligation, transponder requirements, separation rules etc. In-depth description of specific rules applying to all airspace classifications can be found i ”CAA ATS INSTRUKS” chap. 2 supplement 1.
Local approach:	A control unit associated with a control tower with a delegated airspace, which is not a part of TRACON Copenhagen or TRACON Stockholm. These units consist of 1 or several positions.
Sector naming:	The sector names are described by 3 digit numbers and a geographical name. The first digit indicates which scenario the sector is related to, and the second and third are merely consecutive numbers. The geographical name indicates from which control center the sector should be managed.

14 List of acronyms

A/S	Aktieselskab
AAL	Aalborg VOR
AB	Aktiebolag
ACC	Area Control Centre
ADWG	Airspace Design Working Group
AFTN	Aeronautical Fixed Telecommunication Network
AIS	Aeronautical Information Service
ALM	Alma VOR
ALS	Alsie VOR
AMC	Airspace Management Cell
ANS	Air Navigation Services
ANSP	Air Navigation Service Provider
AoR	Area of Responsibility
APP	Approach
APPCO	Approach Coordinator
Arr	Arrival
ARS	Aros VOR
ATC	Air Traffic Control
ATCC	Air Traffic Control Centre
ATCO	Air Traffic Controller
ATFM	Air Traffic Flow Management
ATM	Air Traffic Management
ATS	Air Traffic Services
BCL-FT	Bestämmelser för Civil Luftfart – Flygtrafiktjänst
BFL-ANS	Bestämmelser för Flygtrafiktjänst
BL	Bestemmelser for Civil Luftfart
CAA	Civil Aviation Authority
CACOM	Copenhagen AFTN Communication Centre
CANDI	Civil Aviation National Data Interchange
CATCAS	Copenhagen Air Traffic Control Automated System
CBA	Cost Benefit Analysis
CDA	Codan VOR
CFMU	Central Flow Management Unit
COIF	Copenhagen Information
CNS	Communication, Navigation and Surveillance
COM	Communication
COOR	Coordinator
CTR	Control Zone
DATMAS	Danish Air Traffic Management System
Dep	Departure
DFL	Division Flight Level
Dir	Director (control position)
DK	Denmark
DKR	Dunker VOR
E	East
E2kE	Eurocat 2000 E
EC	European Commission
EKAH	Aarhus/Tirstrup Airport
EKBI	Billund Airport

EKCH	Copenhagen/Kastrup Airport
EKDK	Copenhagen FIR
EKRK	Copenhagen/Roskilde Airport
EKYT	Aalborg Airport
ESARR	Eurocontrol Safety and Regulatory Requirements
ESDF	Ronneby Flygplats
ESGG	Göteborg/Landvetter Airport
ESIB	Såtenäs Flygplats
ESMM	ATCC Malmö
ESMS	Malmö/Sturup Airport
ESOS	ATCC Stockholm
ESOW	Västerås Flygplats
ESPA	Luleå Flygplats
ESSV	Visby Flygplats
Exe	Executive (controller)
EU	European Union
F/S	Feeder/Stacker
FAB	Functional Airspace Blocks
FDA	Flight Data Assistant
FDO	Flight Data Operator
FIGARO	Sub system at ATCC Malmö processing FPL data to Danish military units for traffic passing/crossing Danish territory overhead Bornholm
FIR	Flight Information Region
FIS	Flight Information Service
FL	Flight Level
FMP	Flow Management Position
FPL	Flight Plan
FRAC	Free Route Airspace Concept
FUA	Flexible Use of Airspace Concept
GND	Ground
HMR	Hammar VOR
ICAO	International Civil Aviation Organisation
IFR	Instrument Flight Rules
KOR	Korsa VOR
L	Left
LFV	Luftfartsverket
LoA	Letter of Agreement
MDS	Military Data System
MFF	Mediterranean Free Flight programme
Mil	Military
MSL	Mean Sea Level
N	North
NM	Nautical Miles
NOA	Nora VOR
NSA	National Supervisory Authority
NSP	National Service Provider
NTL	Nortel VOR
NUAC	Nordic Upper Area Control Centre
OAT	Operational Air Traffic
OKC	Öst Göta Control
PLN	Planner (controller)
PM	Project Manager
PMP	Project Management Plan
PMT	Project/Programme Management Team

R	Right
R(x)	RADAR position (x)
RAM	Ramme VOR
ROE	Roenne VOR
RVSM	Reduced Vertical Separation Minima
RWY	Runway
S	South
S	Sweden
S&M	Sequence and Metering system
SARP	Standards and Recommended Practices
SES	Single European Sky
SG	Steering Group
SID	Standard Instrument Departure
SIGMET	SIGnificant METeorological information
SL	Sea Level
SLV	Statens Luftfartsvæsen
SSC	Single Sky Committee
STAR	Standard Arrival Route
SUP	Operational Watch Supervisor
SVD	Sveda VOR
TAC SUP	Tactical Supervisor
TECH	Technical
TECH SUP	Technical Watch Supervisor
TF	Tjenesteforskrift
TIA	Traffic Information Area
TIZ	Traffic Information Zone
TMA	Terminal Control Area
TMC	Terminal Control
TNO	Trano VOR
ToR	Terms of Reference
TRACON	Terminal Radar Approach CONtrol
TRS	Trosa VOR
TSA	Temporary Segregated Airspace
TWR	Tower
UACC	Upper Area Control Centre
UIR	Upper Information Region
VES	Vesta VOR
VFR	Visual Flight Rules
VHF	Very High Frequency
VOR	VHF Omnidirectional Radio Range
W	West
WSS	Watch Supervisor Support