London Southend Airport (LSA) Proposal to Re-establish Controlled Airspace in The Vicinity Of LSA

Airspace Change Proposal

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Executive Summary

London Southend Airport is an Air Navigation Service Provider approved under Article 7 of the European Commission Regulation 550/2004 and, as such, must satisfy the UK Civil Aviation Authority as to their competence to provide Air Navigation Services and that the services provided are safe.

London Southend Airport currently operates in a Class G airspace environment where there are significant numbers of aircraft operating in proximity to the traffic flows inbound to and outbound from the Airport. With growing numbers of Commercial Air Transport passenger flights now using the Airport there has been a commensurate increase in the number of conflicts with diverse airspace operations taking place in the local area. Indeed, since the resumption of passenger carrying services, there have been three AIRPROX incidents between Commercial Air Transport flights operating into and out of the Airport and other flights transiting or manoeuvring within the same area providing evidence of an increasing threat and risk to all stakeholders operating in the vicinity of the Airport. Moreover, this has led to a commensurate increase in Air Traffic Control workload, system complexity, operational delay and extended routing of flights with an associated reduction in the efficient and effective use of the airspace.

In meeting its statutory responsibilities for Safety Management of the air traffic services provided, and to reduce risk to aircraft inbound to or outbound from the Airport in the critical stages of flight, the Airport management submits this case to the Civil Aviation Authority (CAA) to re-establish[1] controlled airspace (Class D) in the vicinity of London Southend Airport.

CAA Civil Aviation Publication (CAP) 725 sets out the administrative process that must be followed in applying for the establishment of controlled airspace and also details the regulatory design requirements for any controlled airspace proposal. This Airspace Change Proposal has been developed in accordance with the requirements specified in CAP725 and other CAA Policy Statements. It has also taken due regard to a number of changes of Policy, or the application of Policy, that have been implemented by the CAA during the development of the Airspace Change Proposal.

CAP725 requires that the sponsor (in this case London Southend Airport) of the proposed change to the airspace arrangements must carry out a Sponsor Consultation with the airspace users who may be directly or indirectly affected by the change and with organisations representing those who may be affected on the ground by the environmental impact of the change. London Southend Airport has carried out a Sponsor Consultation in accordance with the provisions of CAP725 and has taken account of responses and submissions received. Following the Sponsor Consultation, and in the light of the responses received, London

[1] Class D controlled airspace, previously known as Special Rules Airspace, was in place in the vicinity of Southend Airport until 1993 when it was disestablished by the CAA as a consequence of then declining traffic at Southend Airport.

Southend Airport has reviewed and adapted the proposed airspace configuration to ameliorate, as far as is practicable, the concerns of General Aviation and Sport and Recreational airspace users.

Accordingly, London Southend Airport has concluded that the re-establishment of Class D controlled airspace as detailed in this Proposal is justified and represents the most effective designation of airspace that accords with the safety, operational, environmental and regulatory requirements.

Note 1: This Airspace Change Proposal (ACP) has been developed based on the airspace classification in existence at the inception of, and throughout, the development of the project (Class G *without* any Radio/ Transponder Mandatory airspace). No specific account has been taken of the application of an interim airspace development (such as a Radio Mandatory Zone- RMZ); any such airspace augmentation would be of a temporary nature and not permanent, whilst the LSA ACP is proposing to effect a permanent solution to airspace management in the vicinity of LSA.

Note 2: During the development of this ACP the CAA's Directorate of Airspace Policy (DAP) and Safety Regulation Group (SRG) have merged and become known as the CAA Safety and Airspace Regulation Group (SARG). Throughout this document the departments are referenced under the titles pertaining prior to the merger.

Note 3: Throughout the development of this ACP due regard has been taken of Manston Airport, located 29NM southeast of LSA, and its Instrument Flight Procedures and Air Traffic Management operations. The resultant airspace configuration reflects extensive and detailed discussions with Manston Air Traffic Control Management. However, on 7 May 2014, after preparation of this ACP, it was announced that Manston Airport would close on 15 May 2014. It is no longer, therefore, an area of concern for this ACP. Nonetheless, details of the discussions with Manston Air Traffic Control over the development of this ACP have been retained for completeness.

Abbreviations

A/G	Air - Ground
aal	Above aerodrome level
ACC	Airport Consultative Committee
ACP	Airspace Change Proposal
agl	Above Ground Level
AIP	Aeronautical Information Publication
ALT	Altitude
amsl	Above Mean Sea Level
ANO	Air Navigation Order 2008
ANSP	Air Navigation Service Provider
APP	Approach Procedural Service (without radar)
ATC	Air Traffic Control
ATCO	Air Traffic Control Officer
ATM	Air Transport Movement (see context)
ATM	Air Traffic Management (see context)
ATM	Air Traffic Monitor (see context)
ATS	Air Traffic Service
ATSOCAS	Air Traffic Services Outside Controlled Airspace
ATZ	Aerodrome Traffic Zone
BQH	Biggin Hill Airport
CAA	Civil Aviation Authority
CAP	Civil Aviation Publication (published by the CAA)
CAS	Controlled Airspace
CDA	Continuous Descent Approach
CPL	Commercial Pilots License
CTA	Control Area
CTR	Control Zone
DME	Distance Measuring Equipment
FAS	CAA Future Airspace Strategy
FL	Flight Level
FTO	Flying Training Organisation
FUA	Flexible Use of Airspace
GA	General Aviation
GNSS	Global Navigation Satellite System
IAP	Instrument Approach Procedure
ICAO	International Civil Aviation Organisation
IFP	Instrument Flight Procedures
IFR	Instrument Flight Rules
ILS	Instrument Landing System

IMC	Instrument Meteorological Conditions
LAC	NATS London Area Control Centre
LAMP	NATS London Airspace Management Programme
LCY	London City Airport
LoA	Letter(s) of Agreement
LSA	London Southend Airport
LTC	NATS London Terminal Control (part of LAC)
LTMA	London Terminal Control Area
MATS	Manual of Air Traffic Services
MoU	Memorandum of Understanding
NATMAC	National Air Traffic Management Advisory Committee
NATS	NATS Services Ltd
NDB	Medium Frequency (MF) Non-Directional Beacon
NDB(L)	NDB (Locator) (associated with an IAP at an aerodrome)
NM	Nautical Mile
PANS-OPS	Procedures for Air Navigation – Operations
PATM	Passenger Air Transport Movement
PBN	Performance-Based Navigation
PPL	Private Pilot's License
PSR	Primary Surveillance Radar
RNAV	Area Navigation
RotAR	Rules of the Air Regulations 2007
RTF	Radio Telephony
SARG	Safety and Airspace Regulation Group of the CAA
SARP	Standards and Recommended Practices (ICAO)
SERA	Standard European Rules of the Air
SES	Single European Skies
SID	Standard Instrument Departure Procedure
SSR	Secondary Surveillance Radar
STAR	Standard Arrival Route
TMA	Terminal Control Area
VFR	Visual Flight Rules
VMC	Visual Meteorological Conditions
VOR	VHF Omni-Directional Radio Range
VRP	Visual Reference Point

References

See **Appendix A.2**

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List of figures

1. Overview and document layout

1.1. Overview

1.1.1. Commercial Air Transport (CAT) passenger-carrying scheduled services were re-introduced at London Southend Airport (LSA) in March 2011 following the acquisition of the Airport by the Stobart Group in 2008 and a substantial regeneration investment programme supported fully by the Local Planning Authorities (LPAs).

1.1.2. The regeneration investment has included a short extension, to the maximum allowable under the runway's Code 3 criteria, at the runway's south-western end in order to provide landing and take-off distances suitable for short-haul jet aircraft. Additionally, a new Air Traffic Control (ATC) Tower Building, together with a new radar installation and updated navigation infrastructure, a new passenger terminal building and an adjoining new railway station have been provided. These are discussed in more detail later in the document.

1.1.3. As a consequence of its statutory responsibilities as an Air Navigation Service Provider (ANSP), LSA is seeking to re-establish Controlled Airspace (CAS) in the vicinity of LSA to reduce the risk to the operation of CAT flights to and from the Airport in the critical stages of flight immediately after take-off and prior to landing, and itinerant traffic also operating in the local area.

1.1.4. The establishment of controlled airspace by the Civil Aviation Authority (CAA) requires the Sponsor, in this case LSA, to comply with the requirements of Civil Aviation Publication (CAP) CAP725 *"CAA Guidance on the Application of the Airspace Change Process"*, which includes a requirement for a comprehensive Sponsor Consultation to be carried out.

1.1.5. LSA is the Change Sponsor for this Airspace Change Proposal (ACP). However, LSA has engaged Cyrrus Ltd to assist in the development of the ACP. Cyrrus Ltd is a specialist airspace design and management consultancy company with extensive experience in all aspects of airspace design, management and provision of Air Traffic Management (ATM) systems in the UK and overseas. Cyrrus Ltd has wide experience of managing ACPs in the UK to meet the CAA requirements.

1.1.6. This formal proposal follows the format recommended in CAP725 encompassing an Operational Report, an Environmental Report, an Economic Impact Report and a Sponsor Consultation Report.

1.2. Document layout

1.2.1. In order to reflect the format recommended for presentation of the ACP, this proposal comprises 5 parts supported by a number of appendices and other documentation developed and employed during the Sponsor Consultation process.

1.2.2. **Part A** provides:

- A brief overview of LSA including aircraft movement statistics and forecasts;
- Current airspace arrangements and ATM arrangements for arriving, departing and overflying traffic.

1.2.3. **Part B** contains the Operational Report, as specified in CAP725, and includes:

- The requirement and justification for the proposed change;
- Development of Change Options, including the impact on Change Options of the NATS current and forthcoming ATM arrangements in the London Terminal Control Area (LTMA) together with adaptation of the proposal to reflect the views of consultees;
- Arrival and Departure route aspects;
- Supporting Infrastructure and resources;
- The operational impact of the changes on the airspace user community;
- Safety Management.

1.2.4. **Part C** contains the Environmental Report which:

- Complements the analysis of the change options detailed in **Part B**;
- Provides a brief noise analysis of the procedures in use;
- Comments on the carbon assessment and fuel burn aspects of the proposed airspace arrangements;
- Comments on local air quality, tranquillity and visual intrusion.

1.2.5. **Part D** outlines the Economic Impact of the proposed establishment of controlled airspace.

1.2.6. **Part E** presents a Sponsor Consultation Report which details:

- The preliminary Sponsor Consultation and engagement carried out;
- The formal Sponsor Consultation;
- The issues raised in the Sponsor Consultation by consultees and others;
- The results of the Sponsor Consultation and feedback to consultees, including Post-Consultation discussions with airspace user groups;
- The Report of the Sponsor Consultation posted on the LSA website;
- The Post-Consultation reviews of the proposed airspace configuration leading to the final airspace arrangements submitted in this ACP.

1.2.7. A number of Appendices are included which bring amplification and/or clarification to the ACP. **Appendix A** is a Glossary of Terms to provide a reference for the plethora of terms used in aviation as appropriate to this document and supplements the table of abbreviations and acronyms given in the preamble of this document. **Appendix B** lists the

documents and correspondence which are referenced and submitted separately in support of this ACP. The remainder of the Appendices (**Appendices C to I inclusive**) relate to the work undertaken in developing this ACP. Finally**, Appendix J** outlines a schedule towards implementation of the new airspace arrangements.

1.2.8. As noted above, a number of self-contained documents, which have been developed and/or issued during the development and consultation of this ACP are submitted separately and are referenced in the ACP. They comprise:

- Records and Report of the Focus Group stage of the airspace development;
- Post-Focus Group Airspace Review Papers, which detail the in-depth analysis and adaptation of components of the proposed airspace configuration to reflect airspace user input to the Focus Groups;
- The Sponsor Consultation Document;
- The Report of the Sponsor Consultation;
- Further Post-Consultation reviews of the various segments of the proposed airspace configuration reflecting the comments submitted by consultees and others;
- A log kept by LSA controllers of traffic conflict events of concern or those causing delay;
- A log of departure release delays in excess of 5 minutes;
- Safety Management Documentation.

1.2.9. Copies of all responses from Consultees and submissions from other interested individuals or groups, together with LSA follow-up correspondence (where appropriate) are submitted separately. Post-Consultation correspondence and records of Meetings are also submitted separately.

1.2.10. As a consequence of the Post-Consultation Reviews of the proposed airspace configuration LSA has taken the decision to reconfigure the Instrument Approach Procedures (IAPs) to runways 06 and 24. The technical submission for the alteration of IAPs will be submitted separately to the CAA in accordance with the provisions of CAP785.

1.2.11. Whilst the establishment of a new offshore terminal holding pattern forms part of this ACP, the technical submission of holding pattern design data for the establishment of the holding pattern, in accordance with the requirements of CAP785, will be submitted separately.

1.2.12. The technical submission of SID and STAR design data, for procedures to be introduced following the implementation of NATS changes in the LTMA will be submitted at a later date once the configuration and timetable for the NATS changes is established. If it proves necessary, these will be the subject of a further ACP.

1.2.13. Textual and charting changes to the UK Aeronautical Information Publication (AIP) to facilitate the new airspace arrangements will be submitted separately at a later stage.

PART A

INTRODUCTION

2. London Southend Airport

2.1. Overview

2.1.1. LSA is an international airport in Essex, England, and is one of the six main airports serving the London area. The airport is located between the towns of Rochford and Southend, and lies 1.5 nautical miles (NM) north of Southend town centre. The Airport is currently operated by London Southend Airport Company Limited under a CAA Ordinary Licence (Number P893) which allows flights for the public transport of passengers and for flying instruction as authorised by the licensee.

2.1.2. The airfield was established by the Royal Flying Corps during World War I. In 1920, the aerodrome closed and reverted to farmland. A municipal airport was formally opened on the site in 1935 and, in 1939, the Air Ministry requisitioned the airfield whence it became known as Royal Air Force Rochford for the duration of World War II. In 1946, the airfield was decommissioned from military use and civil aviation returned in 1947, under the name of 'Southend Municipal Airport'.

2.1.3. Southend Municipal Airport is probably most widely remembered from its heyday in the 1950s and 1960s as a major Regional Airport operating Cross-Channel Air Ferry services. In that period the Airport was the third-busiest airport in the United Kingdom in terms of passengers handled. Annual passenger traffic peaked in 1967 at just below 700,000 and Southend continued to handle more traffic than nearby Stansted until well into the 1970s, making it London's de facto third airport.

2.1.4. As such, 'Special Rules Airspace' was in place around the Airport (Southend Special Rules Zone) and the en-route segments of airspace in which the Cross-Channel Air Ferry Services took place (Cross-Channel Special Rules Area). Special Rules Airspace was the appropriate level of airspace regulation at the time and was, effectively, equivalent to controlled airspace. Following the introduction of the new ICAO Airspace Classification System in 1991, 'Special Rules' airspace was re-designated as 'Class D' controlled airspace and the Southend Special Rules Zone became the Southend Control Zone (CTR). The airspace arrangements provided a 'known and managed traffic environment' in which all aircraft were known to ATC and the controllers could provide safe and effective separation (both with and without the use of radar) between all aircraft.

2.1.5. However, as the Cross-Channel services declined in the 1970s CAT flights reduced and by the early 1990s passenger flights had declined to the extent that the CAA determined that controlled airspace was no longer justified. Thus the Southend Control Zone was disestablished by the CAA in July 1993.

2.1.6. During the 1990s and early 2000s limited CAT operations took place at the Airport, with the principle activities being aero club, flying training and other General Aviation (GA) activities together with aircraft maintenance facilities for larger aircraft.

2.2. Recent Development

2.2.1. LSA was purchased in 2008 by the Stobart Group and there has since been a vigorous programme of investment and redevelopment at the Airport.

2.2.2. A planning application was submitted in 2009 for a 300m (984ft) extension of the runway (to a useable length of 1799m (5902ft)), together with upgraded navigation aids and lighting infrastructure. Planning Approval was granted in 2010 and the runway extension was brought into use in 2012.

2.2.3. As part of the airport regeneration programme, a new on-site railway station and a new ATC tower have been constructed and these became operational in 2010 and 2011 respectively. Additionally, a new Passenger Terminal Building has also been constructed in phases, of which Phase 1 became operational in 2012 and the final phase was completed in February 2014.

2.2.4. The runway has Category I Instrument Landing Systems (ILS) serving both landing directions. LSA has an excellent weather record and is used by a number of airlines when adverse weather conditions require diversion from other London area airports.

2.2.5. Furthermore, a new Selex Primary Surveillance Radar (PSR) and Mode S Secondary Surveillance Radar (SSR) equipment has been installed and accepted into operational service in June 2013.

2.2.6. In April 2012 easyJet started commercial operations from LSA with around 70 flights per week to a number of European destinations, using 3 Airbus A319 aircraft which are based at LSA. A fourth based-aircraft was added in 2013 as part of a 10-year partnership between LSA and easyJet. Additionally, Aer Lingus Regional (operated by Aer Arann[2]) has established scheduled services between LSA and Dublin which provide connections to transatlantic services. Scheduled services by Flybe to seven domestic and European destinations will commence in the spring and summer of 2014. Charter airlines Thompson and First Choice also operate from LSA during the summer period.

2.2.7. The Government's Air Transport White Paper (ATWP) - *The Future of Air Transport* (2003) provided strong Policy support for the growth of Regional Airports as a feature of UK economic growth, stating:

"Small airports have an important part to play in the future provision of airport capacity in the South East. Their ability to provide services to meet local demand, and thereby relieve pressures on the main airports, will be particularly important before a new runway in the South East is built."

2.2.8. LSA featured specifically in the South East Airports section of the ATWP and was recognised as a key air transport link which would play a:

[2] From March 2014 Aer Arann has been rebranded as Stobart Air.

"……valuable role in meeting local demand and could contribute to regional economic development. In principle we would support their development, subject to relevant environmental considerations"

and

"There is support from a wide range of stakeholders that the small airports in the South East should be allowed to cater for as much demand as they can attract."

2.2.9. The recent developments at LSA are fully in accord with the views of the ATWP and, notwithstanding the economic downturn of recent years, the Airport is well placed to make its contribution to the regional economy.

2.2.10. Notwithstanding that the UK Government is currently preparing a new Aviation Policy framework, the support for the important role of LSA and other Regional Airports remains. Under its new ownership LSA has been highly successful in garnering local support for the Airport's development and has worked with local community stakeholders to maintain the economic benefits that the Airport's resurgence has generated, including the creation of more than 500 new jobs.

2.2.11. Whilst the Airport has supported, and will continue to support, a wide variety of operations including maintenance, cargo, flying schools, business and charter, the growth in passenger flights over the last 24 months has been significant and this is set to continue. LSA's Phase 1 and 2 plans, developed in response to the ATWP, reflect current UK Government policy and provide a framework for the future growth and development of the Airport.

2.3. Aircraft movement and passenger statistics

2.3.1. In common with other UK airports, LSA experienced a decline in all classes of air traffic as a consequence of the general economic situation. However, following acquisition of the airport by the Stobart Group in 2008 and the progressive development programme which has come to fruition, LSA has been successful in attracting new Low-Cost Carrier air transport operations to the airport.

2.3.2. A substantial growth in Air Transport Movement (ATM) operations took place in 2011 as a consequence of the introduction of scheduled services by Aer Arann. Subsequently, in 2012, the introduction of scheduled services by easyJet and Aer Lingus to a variety of domestic and European destinations led to a further substantial growth, rising to a total of 8086 ATMs. Total aircraft movements for 2013 rose to 29443 including 9475 ATMs.

2.3.3. Similarly, the profile of passengers using the Airport reflected the economic downturn; however, there was a regeneration of passenger numbers following the new vigorous marketing campaign undertaken by the new stewardship of the Airport. For 2012, with only 8 months of easyJet operations, passenger numbers grew to 617027, which

represented a 1354% increase over the previous year. In 2013 passenger numbers grew further to 969912.

2.3.4. From June 2013 easyJet based a fourth aircraft at LSA and their range of destinations has been further expanded and currently serves 14 locations across Europe.

2.3.5. In February 2014 it was announced that a survey of over 300 airports across Europe (undertaken by the respected Industry website Airline Network News & Analysis) had shown that LSA was the fastest growing Airport in Europe with a 57.1% growth in passenger numbers from 2012 to 2013.

2.3.6. In the spring and summer of 2014, Flybe, in association with Stobart Air, will commence scheduled services from LSA to a further seven domestic and European destinations.

2.3.7. The Charts at Figure 1 to Figure 3 below illustrate the air traffic and passenger profiles between 2007 and 2013 (derived from CAA Airport statistics publications). Provisional traffic figures for the first 4 months of 2014 indicate the continuing significant growth in ATMs and passengers handled over the same period in 2013.

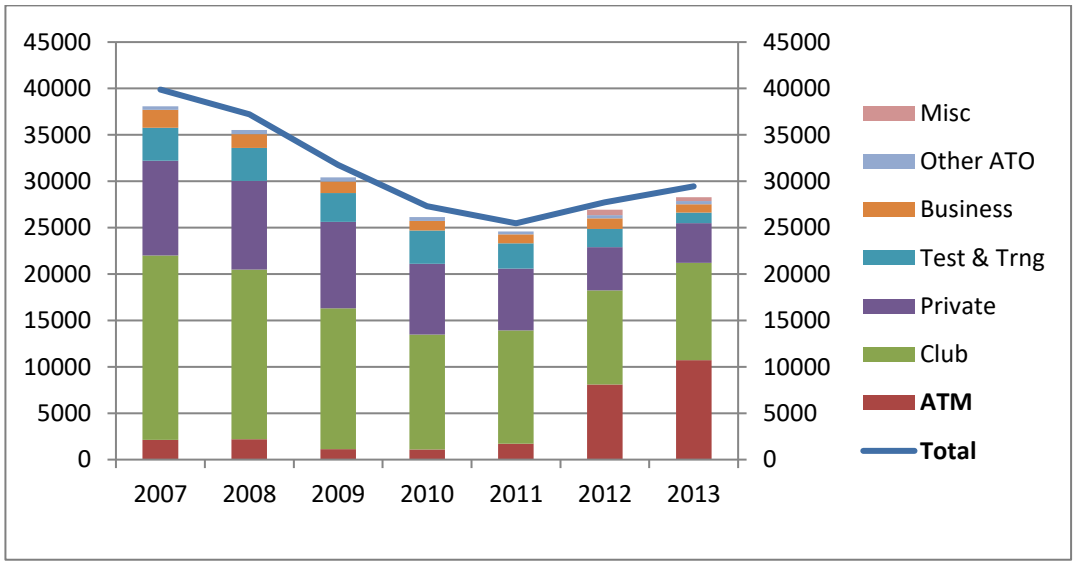


Figure 1: Overall traffic profile 2007 to 2013

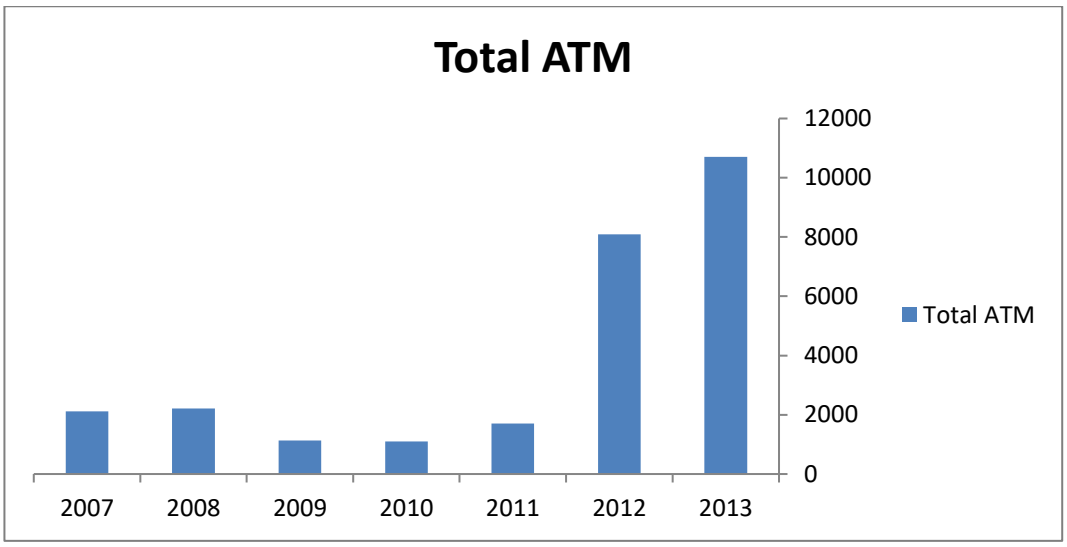


Figure 2: Air Transport Movements

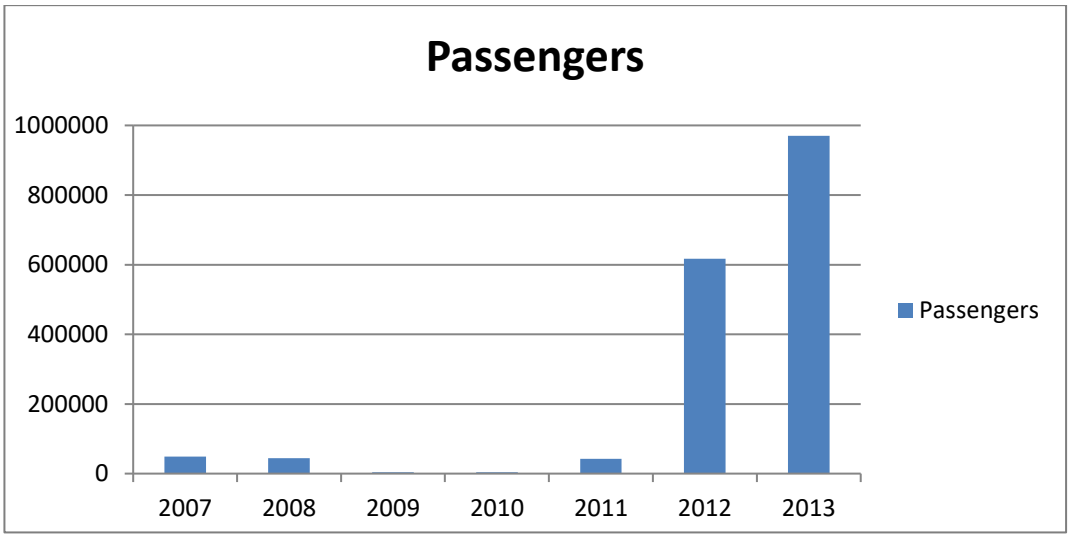


Figure 3: Passengers Handled 2007 to 2013

2.4. Growth forecasts

2.4.1. The LSA Master Plan predicts growth to sustain the handling of 2 million passengers annually by 2020.

2.4.2. A planning condition imposed at the time of Planning Consent for the runway extension in 2010 limits the total number of aircraft movements to 53300 per annum. It is forecast (in the Environmental Statement submitted to the Planning Authority) that the current ceiling will be met by 2020 through a steady growth of ATMs to 26400 and an additional 26900 non-commercial movements (the latter comprising private, business, and training flights).

2.4.3. Traffic and passenger forecasts are illustrated in the Charts at Figure 4 and Figure 5. (Source: Avia Solutions LSA Traffic Validation Report 2009.)

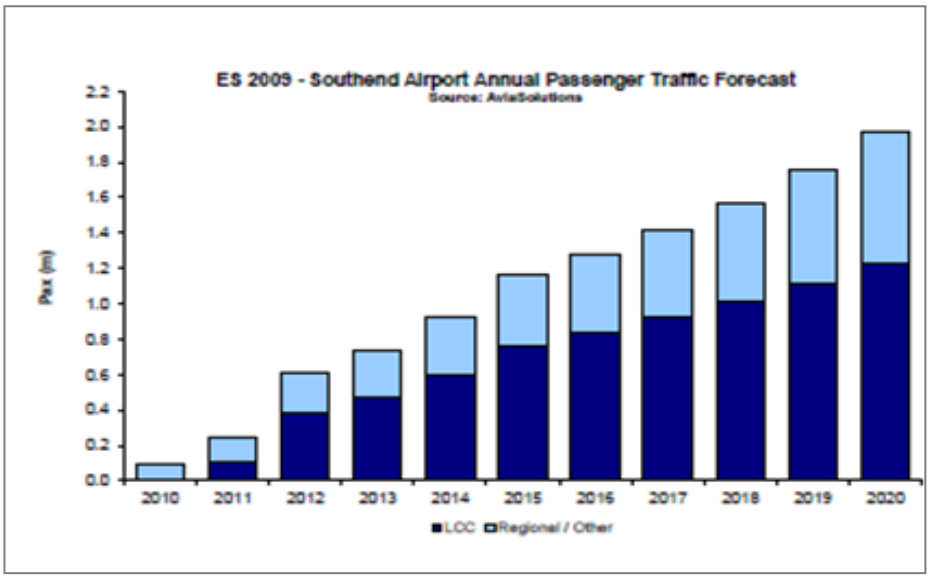


Figure 4: LSA Annual Passenger Traffic Forecasts to 2020

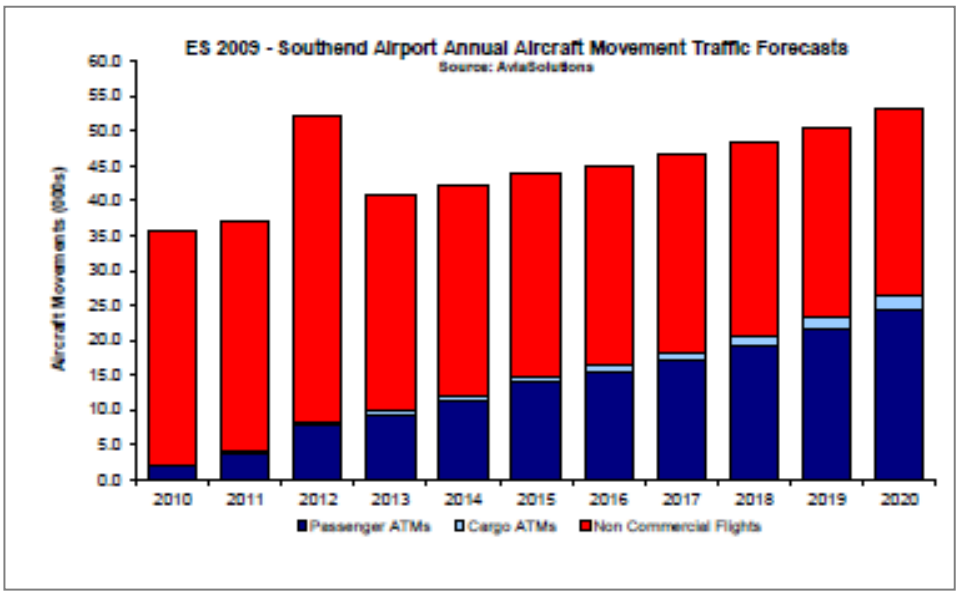


Figure 5: LSA Annual Movements Forecasts to 2020

3. Current Airspace Arrangements

3.1. Overview

3.1.1. LSA currently lies within uncontrolled airspace (Class G airspace) in which any category of aircraft can operate freely and without reference to any ATC Unit, subject only to compliance with the Rules of the Air Regulations (RotAR).

3.1.2. An Aerodrome Traffic Zone (ATZ) is established around the airport to a radius of 2.5NM from the Aerodrome Reference Point from the surface to 2000ft above aerodrome level (aal). The ATZ extends to approximately 2NM along the final approach and departure paths and is the only airspace within which all aircraft are required to make their presence known to Southend ATC and comply with ATC instructions. The ATZ does not encompass the notified holding and IAP procedures for LSA.

3.1.3. The surrounding airspace is utilised intensively by GA and S&R aviation activities of all types including, inter alia, flying training, microlight flying, commercial and training activity by vintage jets and other historic aircraft. The area has numerous aircraft operating sites ranging from large aerodromes such as North Weald and Stapleford through to smaller aerodromes such as Thurrock and Laindon and farm strips. These aspects of the airspace utilisation are covered in more detail later in this document.

3.2. Lower Airspace Radar Service (LARS)

3.2.1. As well as provision of Air Traffic Services (ATS) to traffic operating to and from the Airport, LSA ATC also provides Air traffic Services Outside Controlled Airspace (ATSOCAS) services to en route and other flights beneath the LTMA under the auspices of the Lower Airspace Radar Service (LARS) Scheme[3] to a radius of 30NM from LSA.

3.2.2. In 2013 Southend ATC provided en route ATC services to 22895 aircraft not related to LSA itself under the auspices of the LARS scheme. Whilst this represents a proportion of the airspace activity taking place in proximity to the LSA arrival and departure traffic flows and results in the LARS traffic becoming 'known' traffic (and, in most cases, amenable to being 'managed' to resolve conflict with other traffic) in the main it comprises 'en route' traffic rather than traffic carrying out local training or other 'manoeuvring' operations in the area.

3.2.3. In addition, the LARS over the south-east of England provided by Farnborough ATC[4] also results in some traffic operating in proximity to LSA traffic flows becoming 'known' traffic through the recognised inter-unit co-ordination procedures and the use of discrete SSR squawks.

[3] UK AIP ENR 1.6 Paragraph 3
[4] UK AIP ENR 1.6 paragraph 3.7

3.3. London TMA

3.3.1. The Class G airspace above and in proximity to LSA is overlaid by the LTMA (Class A controlled airspace) from 3500ft above mean sea level (amsl) upwards. Other LTMA segments with base levels 2500ft, 4500ft and 5500ft amsl also overlie the area of interest to LSA operations.

3.3.2. The LTMA is under the jurisdiction of NATS London Terminal Control (LTC) and has been established and developed over many decades to serve the high density air traffic operations routing to and from the major London Airports[5].

3.3.3. Also pertinent to the airspace arrangements in proximity to LSA is the Clacton Control Area (CTA), also Class A controlled airspace, with base levels of 5500ft amsl and Flight Level (FL) 85 in the areas of interest.

3.3.4. The configuration of the LTMA is shown at Figure 6.

3.3.5. The LTMA embraces a myriad of Airways, Standard Arrival Routes (STARs), Terminal Holding Patterns, Standard Instrument Departures (SIDs), link routes and areas for tactical radar directed manoeuvring of air traffic for the London area airports and overflying traffic.

3.3.6. The portions of the LTMA of particular relevance to this ACP are the Thames Radar and TC NE Sectors. Thames Radar handles both the formal route structure and the tactical handling of traffic inbound to and outbound from London City Airport (LCY), Biggin Hill Airport (BQH) and Rochester Airport as well as traffic generated by LSA itself. TC NE Sector handles the formal route structure and tactical handling of LSA traffic to and from the north of Southend, as well as that from the other London area airports. A schematic of the Thames Radar Sectors is shown at Figure 7.

[5] London Heathrow Airport, London Gatwick Airport, London Stansted Airport, London Luton Airport, London City Airport and RAF Northolt.

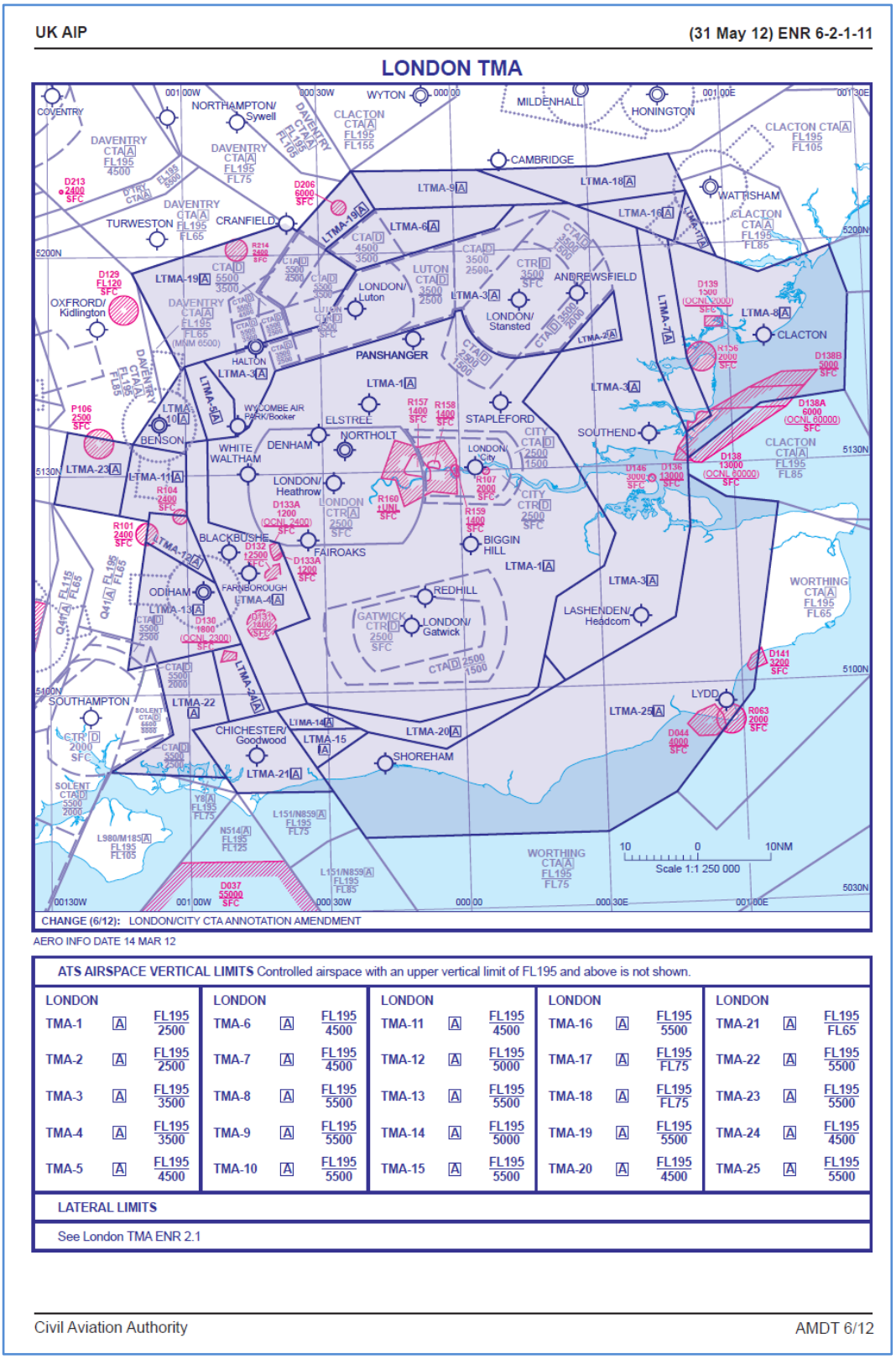


Figure 6: London Terminal Control Area (LTMA)

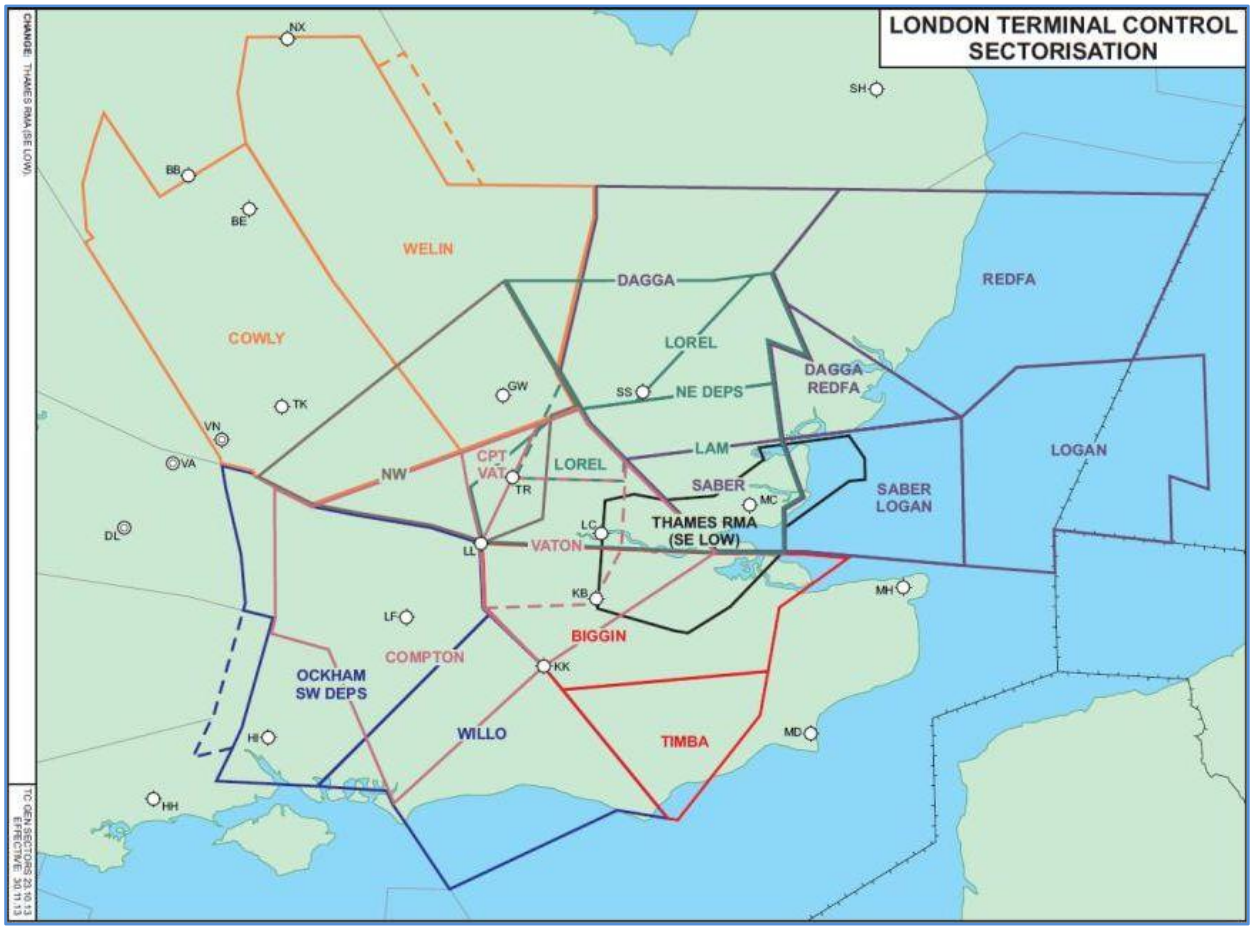


Figure 7: Thames Radar Sectors

3.4. Shoeburyness Danger Areas and other airspace restrictions

3.4.1. Immediately to the east and south-east of LSA, covering a sector of approximately 90 arc degrees, is the Shoeburyness Danger Area (DA) complex[6]. This comprises a number of segments of restricted airspace each with different dimensions and periods of activity. This airspace protects aviation operations from the potentially hazardous activities taking place over Foulness Island and the Maplin Sands. The Shoeburyness Range is a Strategic National Asset and all aircraft operations to/from and operating in the vicinity of LSA must take due regard of the DA activity at all times and avoid active DA airspace.

3.4.2. DA activity takes place principally on weekdays from 0730 – 1700 (local times) and comprises firing and munitions detonations. The lateral boundaries of the DA segments encompass any safety buffers for the activity and aircraft may operate up to the DA boundary. Normal upper limit of the principle DA segment is 13000ft amsl but provision is made for occasional activity to 60000ft. Provision is included in the DA notification for Unmanned Aerial Vehicle operations, although none are currently carried out.

[6] Comprising EGD 136, 138, 138A and 138B

3.4.3. LSA ATC has an excellent working relationship with the DA Operator (QinetiQ) and provides a Danger Area Activity Information Service, as notified in the UK AIP, to itinerant GA traffic on request. LSA ATC also takes steps to notify the DA Range Officer if an infringement of an active DA segment appears likely by a non-communicating aircraft.

3.4.4. As an adjunct to the development of this ACP, and in recognition of the growth of CAT operations at LSA, LSA together with the DA Operator and DA Authorities are working closely together to develop possible improvements to the DA internal segmentation to allow improved airspace sharing arrangements. However, this is a separate project and is independent of this ACP.

3.4.5. As the DA airspace is not active at night or at weekends or Public Holidays, the ATM arrangements for LSA must reflect and make provision for both the DA Active and the DA Inactive configurations. This is covered in more detail later in this ACP.

3.4.6. Other airspace restrictions pertinent to the LSA area of operations include a Restricted Area (R156) around the Bradwell Nuclear Power Station to the north-east up to 2000ft amsl and a small DA (D146 Yantlet) up to 3000ft amsl to the south. There are also two Gas Venting Stations (of 2NM diameter and up to 3500ft amsl) on the Isle of Grain which must be taken into account in the design of the airspace configuration.

3.5. Adjacent aerodromes

3.5.1. The Essex and North Kent areas are heavily populated by a myriad of GA and S&R aviation sites, mostly located at historic wartime aerodrome sites. The area is probably the most densely populated area in the UK for flying sites of varying significance and the airspace activity generated is of consequence to LSA and its own traffic profiles and to the origination of this ACP.

3.5.2. The aerodromes and flying sites listed below, whilst not exhaustive, identify those which are of most significant to the airspace activity in proximity to LSA and which have had a significant impact on the development of this ACP:

- Andrewsfield: 21NM north-north-west of LSA; elevation 285ft, runway alignment 09/27; runway length 719m; Air/Ground (A/G) service; unit-based Flying Training Organisation (FTO);
- Barling Airstrip: 3.5NM east of LSA; elevation 16ft; runway alignment 02/20 and 07/25; runway length 420m and 306m; Private strip;
- Barnards Farm (West Horndon) Airstrip: 15NM southwest of LSA; (2NM north of Thurrock); runway alignment 06/24; runway length 500m;
- Burnham Airstrip: 6.5NM northeast of LSA; 0.5NM south of the LSA final approach track; private strip, single based aircraft, occasional use;
- Canewdon: 3NM north of LSA; a field used for non-radio parascending;

- Damyns Hall: 17NM southwest of LSA; elevation 56ft amsl; runway alignment 03/21, 14/32; runway lengths 855m and 365m; A/G service, adjacent to London/City CTA; active with 4 microlight flying schools; light single, microlight aircraft and hang gliders based there;
- Earls Colne Aerodrome: 20NM north of LSA; elevation 225ft amsl; runway alignment 06/24; runway length 939m; ATZ; A/G service; unit-based FTO;
- Eastchurch Airfield: 11.5NM southeast of LSA; elevation 100ft amsl; runway alignment 26/08; runway length 700m (approx.); private strip; no ATS;
- Gerpins Farm Airstrip: 17.5NM southwest of LSA (1NM west of Damyns Hall); elevation 30ft amsl; runway alignment 24/06; runway length 420m; private strip;
- Jenkins Farm: 18.75NM WNW of LSA (2NM ESE of Stapleford Tawney); elevation 250ft amsl; runway alignment 02/20 runway length 650m; private strip.
- Laindon Airstrip: 9.5NM west of LSA; elevation 70ft amsl; runway alignment 08/26; runway length 475m; non-radio and non-transponder light aircraft and microlights based;
- Manston Airport: 28NM southeast of LSA; elevation 178ft amsl; runway alignment 10/28; runway length 2748m; ATZ, ATC (including radar); IAPs: (IAPs runway 10 affected by LSA ACP.)[7];
- Maypole Aerodrome: 22NM southeast of LSA; elevation 110ft amsl; runway alignment 02/20; runway length 650m; A/G service; based light and microlight aircraft;
- North Weald Aerodrome: 22NM west of LSA; elevation 321ft amsl; runway (paved) alignments 02/20 and 13/31; runway lengths 1881m, 835m; A/G service; FTOs; historic aircraft (including jets) commercial and training operations; major airspace users;
- Rochester Airport: 15NM southwest of LSA; elevation 426ft amsl; runway alignments 20/02 and 16/34; runway lengths 827m and 963m; ATZ, Aerodrome Flight Information Service; Non-Directional Beacon (NDB -no IAPs); corporate, flying club and FTO aircraft based. Proposed IAP for runway 20 will cross LSA runway 06 IAPs; runway 16/34 to be decommissioned;
- St Lawrence Airstrip: 8.5NM northeast of LSA, elevation 111ft; runway alignment 08/26; runway length 730m; private strip; current agreed pre-notification arrangements with LSA ATC;
- Stapleford Aerodrome: 21NM west of LSA; elevation 185ft amsl; runway alignments 04/22 and 10/28; runway lengths 1077m; ATZ; A/G service; Location of NATS en route and terminal navigation facility Lambourne (LAM) Very High Frequency Omni

[7] After the development of the proposed airspace arrangements and this ACP, it was announced that Manston Airport would cease operations on 15 March 2014. However, for completeness and because Manston Airport has influenced the development of the proposed airspace arrangements, details are retained within this ACP,

Directional Radio Range (VOR) site; FTO to all licensing levels; 40+ aircraft based; major airspace user;

- Stoke Microlight Aerodrome: 7.5NM south of LSA on the Isle of Grain; elevation 10ft amsl; runway alignment 06/24; runway length 510m; A/G service; microlight manufacturing; microlight flying training and private flying;
- Stow Maries Aerodrome: 6.3NM northwest of LSA; elevation 186ft; runway alignment generally north/south but random directions available; runway length 685m; historic aerodrome site; light, microlight and historic aircraft (non-radio, non-transponder) based and visiting; large model aircraft flying; occasional fly-ins and air displays.
- Thurrock: 15NM southwest of LSA; elevation 25ft amsl; runway alignment 07/25; runway length 650m; 20+ light single and twin & microlights based;
- Tillingham Airstrip: 9.5NM northeast of LSA; elevation 69ft; runway alignment 02/20; runway length 700m; private strip;
- Willingale: 18NM NW of LSA (5NM NE of North Weald); elevation 250ft amsl; runway alignment 02/20, runway length 350m; private strip.

3.5.3. Further afield many other aerodromes and flying sites generate substantial GA and S&R aviation activity of all classes which transits through or operates within the area of interest to LSA CAT operations.

PART B

OPERATIONAL REPORT

4. Introduction

4.1. In accordance with the requirements of CAP725, this Part of the ACP details the justification for the proposed controlled airspace, the evolution of the proposed airspace configuration as the various Sponsor Consultation stages have progressed through to the description of the proposed airspace configuration.

4.2. It also outlines the impact of the emerging NATS London Area Management Plan (LAMP) project on the proposal and the intended operating methodology both before and after the introduction of NATS LAMP arrangements in the LTMA.

4.3. This Part of the ACP also outlines the operational impact of the airspace arrangements on the CAT aircraft operators using LSA and on the GA and S&R airspace users who make use of the surrounding airspace.

4.4. It is acknowledged that the proposed airspace configuration does not fully meet the regulatory requirements for containment of IFPs in all cases. Due regard has been taken of CAA Policy and guidance in this respect and a safety argument has addressed those areas where procedures, or their associated protection areas are not fully contained.

4.5. Supporting maps and diagrams are given in Appendices to the ACP and are referenced, as appropriate, in the text. The full submission of AIP material will follow at a later stage.

5. Justification for the change

5.1. Overview

5.1.1. Operations by the increasing numbers of passenger carrying CAT flights to and from LSA currently take place in Class G uncontrolled airspace which is shared with a high density of diverse airspace activity and airspace users who do not always participate in the ATS available from LSA or from Farnborough LARS. A proportion of the aircraft using the surrounding airspace are not radio and/or transponder equipped and a significant proportion (at the lighter end of the aviation spectrum) do not make good primary radar targets and so are, largely, unseen by LSA ATC.

5.1.2. The diverse airspace activity is constrained vertically by the overlying LTMA (Class A controlled airspace) from 3500ft amsl which, in itself, also contains a complex and intensively populated network of ATS routes at the lower levels.

5.1.3. CAT flights departing from LSA must remain outside controlled airspace until climb clearance into the LTMA can be coordinated between the LSA and the LTC sector controllers. Similarly, CAT flights inbound to LSA are descended out of controlled airspace much earlier than would be optimum as a consequence of the route complexity and congestion at the lower levels of the LTMA.

5.1.4. In each case, the portion of flight by the IFR CAT aircraft below controlled airspace takes place at a period of high cockpit workload immediately after departure or prior to landing, when aircraft configuration changes are taking place and checklists must be performed. At this time there is little opportunity for crews to maintain the enhanced lookout for other aircraft required of operations in Class G airspace, assess conflictions and undertake avoidance manoeuvres required by the RotAR.

5.1.5. LSA ATC endeavours to provide, by agreement, an ATSOCAS Deconfliction Service to arriving and departing CAT flights. In so doing, it is acknowledged that the planned deconfliction minima specified as part of the Service may, on occasions, not be achieved. CAP774 places the emphasis of the Deconfliction Service more at collision avoidance rather than on separation in the high workload period of flight immediately after departure and on final approach[8].

5.1.6. However, given the vertically constrained airspace volume and the density of itinerant traffic in the area it is regularly impracticable for the planned deconfliction minima to be achieved by LSA ATC. The provision of ATS extends throughout the area of operation of CAT flights beneath the LTMA, and is not confined to the final approach or to immediately after departure. Radar vectoring instructions to avoid unknown traffic or known manoeuvring traffic can be a distraction to flight crews during a period of high cockpit

[8] CAP774 Chapter 4 paragraph 7.

workload and as a result LSA controllers have to be especially astute and empathetic in the delivery of ATS.

5.1.7. Furthermore, extended routing or repositioning of arriving flights or ground delay of departing flights to resolve confliction leads to an inefficient use of the airspace overall, added fuel burn, community disturbance and delay.

5.1.8. In the three years of operating experience of CAT flights in the Class G airspace environment three AIRPROX incidents (as explained in paragraph 5.2) have taken place. This has led to concerns about the increased risk to CAT operations in Class G airspace where there is a high density of other aviation activity taking place.

5.1.9. LSA, as an ANSP approved under Article 7 of the European Commission Regulation 550/2004, must satisfy the UK CAA as to their competence to provide Air Navigation Services and that the services provided are safe. Equally, where any concerns might arise over the delivery of the air navigation service provided then LSA has a duty to take steps to resolve those concerns and ensure the continuing safe and efficient operation of the service.

5.1.10. Accordingly, therefore, LSA considers that the re-establishment of controlled airspace in the vicinity of LSA to provide a safe, efficient and effectively managed controlled airspace environment for CAT flights operating to and from LSA, and improve the airspace arrangements, for all flights operating in the airspace is required. The provision of controlled airspace as detailed in this ACP is both justified and of paramount importance.

5.2. Airspace incidents and other airspace events

5.2.1. Since the introduction of passenger carrying CAT flights at LSA in the spring of 2011, three AIRPROX incidents involving CAT flights inbound to or outbound from LSA have been reported[9]. The UK AIRPROX Board (UKAB) investigations categorised two as Cat A (Risk of collision existed) and one as Cat C (No actual risk of collision existed). Notwithstanding the classification of the latter, it did raise concerns over the complexities of the LSA/LTC interface for arriving flights. In one case the LSA controller was commended by the UKAB for his endeavours to warn the CAT pilots of the threat making best use of the available resources.

5.2.2. A brief synopsis of each AIRPROX, is given at **Appendix C** of this ACP. Full details of each incident and the UKAB consideration of it can be found in the UKAB Report Documents at www.airproxboard.org.uk.

5.2.3. Notwithstanding the specific AIRPROX incidents themselves, other traffic situations frequently arise which cause either concerns to the controllers and/or pilots involved or significant delay or rerouting of flights to resolve conflict. Whilst not generally falling under the category of 'Reportable Occurrences' in their own right such airspace

[9] UKAB Reference Numbers: 2012-156; 2013-029; 2013-082

inefficiencies and concerns are of relevance to the justification for the provision of controlled airspace.

5.2.4. Accordingly therefore, in order to inform and support this ACP, LSA controllers have kept a log of instances where the airspace situation has caused concern or substantial delay. This is detailed at CL-4835-DOC-138 which is submitted separately. Furthermore, a number of 'screen shots' of LSA radar displays are given at **Appendix D** which show typically complex traffic situations.

5.2.5. LSA considers that, as the number of passenger carrying CAT flights operating to and from LSA increases, then continued operation through airspace in which there is a high density of non-communicating, transiting and manoeuvring aircraft of all categories might lead to an increase in AIRPROX and other airspace incidents. LSA, as a responsible ANSP, has a duty to respond to the potential increase in risk and take steps to resolve the situation.

5.3. Departure delays

5.3.1. All traffic departing from LSA into the LTMA and Airways System is subject to co-ordination between the LSA and the appropriate LTC Sector Controllers before the aircraft can depart. A formal Departure Release must be given by the LTC controller.

5.3.2. Historically, as a consequence of LCY and its associated SID and STAR route structure being embedded at the lowest levels of the LTMA ATM System, the flow of traffic inbound to and outbound from LCY has precluded the introduction of LSA departure procedures which would ensure that traffic joining controlled airspace from LSA could do so immediately after departure.

5.3.3. Outbound Routes from LCY to the east (via CLN) pass close to the LSA overhead. Outbound routes to the south (via DET and the Thames Gate arrangements) pass close to LSA to the west and south and, in particular, to the route of the LSA runway 24 Noise Abatement and departure procedures. Inbound routes to LCY from the western, northern and eastern parts of the LTMA are focussed on SPEAR which is located directly overhead LSA. LCY traffic generally occupies altitudes from 4000ft amsl upwards when in proximity to LSA, which constrains the ability for LTC sector controllers to approve departure or give climb clearance into the LTMA for LSA departing traffic.

5.3.4. The pre-departure co-ordination and release process is compounded by the complex juxtaposition of LTC sector boundaries in proximity to LSA.

5.3.5. Furthermore, in 2012, as a consequence of a number of airspace incidents – unrelated to operations at LSA – involving LCY SID procedures, the onus is now placed on the LTC Sector controllers for approving further climb clearance above the 3000ft ALT SID limit to ensure that aircraft departing from LCY remain within controlled airspace. However, until 2-way Radio Telephony (RTF) contact has been established with the appropriate LTC Sector Controller and 4000ft ALT vacated, LCY departures remain procedurally in confliction with

LSA departures to the north. Therefore, all LSA northerly departures are subject to individual Release by LTC to prevent conflictions arising.

5.3.6. Overall, the pre-departure co-ordination of LSA traffic coupled with the prevalence of LCY traffic at the lower levels of the LTMA leads to delays in the co-ordination of Departure Release. Whilst this may have been acceptable when LSA generated minimal traffic demand for access to the LTMA, the delays incurred are no longer acceptable. A record of significant departure delays to LSA traffic resulting from the pre-departure release requirements predominantly for northbound traffic has been compiled and is submitted separately at CL-4835-DOC-139.

5.3.7. Furthermore, once a Departure Release has been issued by the LTC Sector, normally limited to an altitude below controlled airspace, LSA ATC must provide an ATSOCAS Deconfliction Service to the CAT flight whilst it is below controlled airspace until such time as the Thames Radar controller can give climb clearance into the LTMA or accept the traffic below controlled airspace[10]. This procedure increases risk to CAT aircraft by increasing flight time within Class G airspace.

5.3.8. It is acknowledged that departure release delays are greater for LSA traffic departing to the north/north-westerly routes (via EVNAS) into TC North Sector because of the interaction with the frequently conflicting LCY departure and arrival routes. This route has proved the most complex in the development of the controlled airspace arrangements. Equally, LSA traffic departing into this quadrant is interacting with the most densely occupied area of Class G airspace whilst beneath the LTMA.

5.3.9. Following extensive discussion with NATS LTC operations, LSA Staff have concluded that, whilst pre-departure co-ordination of LSA departures would continue to be a requirement, the incorporation of LSA as a fully integrated LTMA airport within contiguous controlled airspace would result in:

- More streamlined and efficient pre-departure co-ordination and release;
- A more equitable integration of LSA traffic into the LTMA traffic flow;
- Reduced tactical intervention after departure to avoid unknown traffic;
- Reduced departure delays and more efficient flight profiles for LSA departing traffic overall.

[10] When Thames Radar accepts traffic below the LTMA then they provide only a Traffic Service rather than the requested Deconfliction Service.

6. Options for change

6.1. Overview

6.1.1. The development of new airspace arrangements is a careful balance between the competing, and often incompatible, needs of all of the various airspace user groups and must also take into account the environmental and economic impact of aircraft operations.

6.1.2. In addition, any new airspace development must also take due regard of the aspirations of the CAA's Future Airspace Strategy (FAS) and be compatible with Performance-Based Navigation (PBN) concepts whilst providing for navigation equipage levels of all airspace users currently using the Airport.

6.1.3. In this particular airspace development, an objective of which is to provide a contiguous and integrated linkage to the overlying LTMA ATM System, due regard has had to be taken of the emerging NATS LAMP Phase 1a Project and the evolving future ATM concepts to be introduced in the eastern part of the LTMA shortly after the implementation of this ACP. The airspace arrangements around which this ACP is framed must be compatible with both the current and the future LTMA operating arrangements, the latter of which are still not finalised at the submission of this ACP.

6.1.4. Furthermore, the LSA ATM operation is located in airspace which has a high density of GA and S&R aviation activity which is densely populated with flying sites of varying significance.

6.1.5. This combination of diverse and evolving requirements has added greater design complexity to this project than would normally be the case. A balance has had to be struck between meeting the regulatory requirements specified for airspace design in the UK (including, in some aspects, a changing emphasis by the CAA on the application of the regulatory requirements) and the diverse needs of airspace users and ANSPs expressed through consultation and discussion. In some aspects innovative solutions and a pragmatic view have been required in balancing the objectives, but, at all times, flight safety has taken precedence.

6.1.6. In developing this ACP LSA has remained cognisant of the airspace change requirements specified in CAP725. A range of options has been considered, ranging from 'Do Nothing', through the application of options which do not involve the application of controlled airspace, to the development of the final proposed airspace configuration for Class D controlled airspace. In many cases Options previously considered have been readdressed as a consequence of responses to Sponsor consultation. Indeed, the final proposed airspace configuration has derived from a decision by LSA to invest in revised IAPs which had previously been eliminated from the design brief on grounds of cost and potential delay to the project.

6.1.7. This Section of the ACP discusses the 'broad-brush' range of options considered by LSA leading up to the development of the preferred option and final configuration proposed and presented in **Section 7** of this ACP.

6.2. Option 1: Do Nothing

6.2.1. CAP725 requires that all proposals to develop new or revised airspace arrangements include consideration of the 'Do Nothing' option.

6.2.2. If no action was taken to reduce the risk and efficiency issues arising from the operation of increasing numbers of passenger carrying CAT flights through Class G airspace in which there is a high density of diverse air activity taking place then the rate of risk-bearing conflict for CAT flights would be highly likely to increase.

6.2.3. As explained in paragraph 5.2, three AIRPROX incidents involving CAT flights inbound to LSA have taken place in the past three years. The introduction of additional measures to reduce the potential for further AIRPROX incidents is seen as necessary by LSA.

6.2.4. Furthermore, the lack of controlled airspace integration with the overlying LTMA route structure and ATM System results in significant ground and airborne delay to CAT operations at LSA as well as exposure to the risk detailed above.

6.2.5. LSA has had three years of operational experience of the 'Do Nothing' option and, with the increasing numbers of CAT flights now taking place, maintaining the status quo is no longer deemed to be an appropriate option.

6.3. Option 2: Options which do not involve controlled airspace

6.3.1. LSA is conscious to the fact that airspace management solutions which do not involve the establishment of controlled airspace are much preferred by the GA and S&R aviation communities and the most recent CAA Policy Statement on the Classification of Airspace in the UK places a new emphasis on the use of such solutions. In particular such an airspace management solution would avoid the concerns expressed by the GA and S&R aviation community over the forthcoming application of the Standard European Rules of the Air (SERA) which will enforce the application of the ICAO Annex 2 VMC Minima Standard in UK controlled airspace below 3000ft amsl[11].

6.3.2. LSA acknowledges that a proportion of traffic operating in Class G airspace does, in fact, request an ATS from LSA either through the LARS System or the application of good airmanship. In 2013, LSA ATC provided transit ATC services to 22895 aircraft not related to Southend Airport itself under the auspices of the LARS scheme.

[11] The UK has, in the past, registered a Difference to the ICAO Standard which enables light aircraft operating below 3000ft amsl to operate to lower visibility and distance from cloud VMC minima than allowed for in the Annex 2 Standard. SERA will enforce a uniform application of the ICAO minima across Europe and is perceived by the GA and S&R aviation community in the UK to be detrimental to their historic rights.

6.3.3. It is reasonable to assume that this proportion of the airspace user community would be amenable to continuing to contact LSA ATC, in order to resolve conflict with CAT flights. Indeed, the mere fact that the intentions of such traffic are known enables a reduction in the deconfliction minima that would otherwise need to be applied. However, such management would need to be achieved by consensus with the pilots concerned rather than by direct management of the airspace and traffic flow.

6.3.4. However, LARS traffic represents only a proportion of traffic operating in the Class G airspace in proximity to LSA and is generally transiting the area.

6.3.5. Similarly a proportion of other traffic carrying out training flights or other manoeuvring flights in the area does establish contact with LSA ATC and is generally amenable to continuing to contact LSA ATC, to assist in the resolution of conflict with CAT flights. Indeed, LSA has, through the GA and S&R aviation media, promoted an awareness campaign and has encouraged GA and S&R aviators to communicate with LSA ATC when operating within the area. This has led to some success in increasing the proportion of 'known traffic' in the area.

6.3.6. Conversely the majority of traffic carrying out training flights or other manoeuvring flights still does not wish to communicate with LSA or any other service provider and, thus, remains unknown traffic.

6.3.7. Furthermore, it is known from experience that a proportion of this traffic is not visible to primary radar and thus conflict resolution can only be achieved through the 'See and Avoid' principal understood by pilots and applied without any ATC assistance. Visibility from the cockpit of fast-moving CAT aircraft is not good and the period of the flight below the LTMA is a period of high cockpit workload with aircraft configuration changes and checklists being carried out with the concomitant need for the crew's attention to be 'heads in' more than would be considered ideal. Clearly, the potential need for passenger carrying aircraft to have to undertake sudden manoeuvring to avoid small aircraft is less than desirable and not to be encouraged.

6.3.8. Thus, it is imperative that a means of 'capturing' and managing these flights is established in order to reduce risk and enhance the safety of operation of CAT aircraft.

6.3.9. LSA has carefully considered whether an enhancement of Class G airspace by means of Radio Mandatory Airspace (RMA) or Transponder Mandatory Airspace, or a combination of both, would provide sufficient means and capability to manage effectively the airspace and maintain the safe and efficient operation of CAT flights without the need to resort to establishment of Class D controlled airspace. The options arising for consideration are:

- Option 2A: Class G airspace with RMA (Area or Zone);
- Option 2B: Class G airspace with Transponder Mandatory Airspace;
- Option 2C: Class G airspace with both RMA and Transponder Mandatory Airspace.

6.4. Option 2A: Class G airspace with RMA

6.4.1. A pilot is required to establish two-way communication with the appropriate RMA authority before entering the RMA and pass details of the aircraft and intentions of the flight and thereafter listen out on the appropriate frequency. The RMA could comprise either an Area or a Zone.

6.4.2. ATC clearance to enter the RMA is not required, nor is compliance with ATC instructions. Thus entry into the airspace is unmanaged and is not conditional on the pilot taking due regard of the prevailing traffic situation or ATM considerations. This applies equally to VFR and IFR flights.

6.4.3. Whilst a RMA establishes an airspace environment in which all aircraft are known, it does not provide an ability for ATC to assure deconfliction of CAT flights from other airspace activity other than to the extent, and to the same deconfliction minima, afforded by the background Class G airspace. Unless a specific deconfliction agreement is negotiated with the individual VFR or IFR GA pilot then deconfliction for CAT flights must be achieved by vectoring the 'Deconfliction Service' traffic (i.e. CAT aircraft) around other radar returns to the extent practicable within the available airspace.

6.4.4. Furthermore, the 'outside controlled airspace' VMC minima below 3000ft amsl would apply, which would provide VFR GA flights with much lower minima than those applicable to the CAT flights in the same airspace. Thus, in poor weather conditions or close to cloud, whilst a GA flight might be in VMC and legitimately operating as a VFR flight and relying on 'See and Avoid' the adjacent CAT flight may well be in IMC. Given that CAT aircraft operate at speeds significantly greater than those allowed for in the determination of 'VMC' by the pilots of small aircraft then the likelihood of encounter between a slow moving 'VFR' light aircraft and a faster IFR CAT flight remains a probability.

6.4.5. Whilst the majority of GA and S&R aircraft (including gliders) are RTF equipped, a proportion of the aircraft flying through the area are not equipped with radio or prefer not to use them. Conversely, the regulations for RMA require the RMA Authority for the airspace to make provision for non-compliant aircraft to gain access to the RMA. This would, most likely, need to take the form of multiple Letters of Agreement (LoAs) with peripheral aerodromes, notwithstanding that the airspace itself would remain uncontrolled.

6.4.6. The continued requirement to apply ATSOCAS Deconfliction Service to CAT flights within an uncontrolled airspace environment would not enable improved airspace management efficiency to be achieved in the LSA/LTC interface arrangements.

6.4.7. LSA has concluded that Class G airspace combined with RMA would not meet the safety or airspace efficiency requirements sought to a suitably robust level and is, therefore, not acceptable as a long-term ATM solution.

6.5. Option 2B: Class G airspace with Transponder Mandatory Airspace

6.5.1. Compliance with Transponder Mandatory Airspace requires carriage of a Mode A/C/S transponder by all aircraft operating within the notified airspace, except that provision must be made for access by non-compliant aircraft. A substantial proportion of light and microlight aircraft which routinely operate in proximity to LSA, whilst radio equipped, are not transponder equipped and are not capable of being so equipped. Similarly, most gliders which transit through the area on cross-country flights are not transponder equipped.

6.5.2. Transponder Mandatory Airspace alone places no commensurate communications requirement upon the pilot. It does not, therefore, generate a known and managed airspace environment. ATC knows only the presence of, not the intentions of, each aircraft[12]. Airframe identity can be established by means of SSR Mode S but, again, airframe identity provides no information of flight intentions or nature of the flight or the flight rules under which it is operating. Transponder Mandatory Airspace does not, therefore, provide an ability for ATC to assure deconfliction of IFR CAT flights from other airspace activity other than by manoeuvring the CAT flights around all other aircraft within the airspace whilst using best endeavours to establish, as far as is practicable, the required Deconfliction Service minima.

6.5.3. Again the 'outside controlled airspace' VMC minima would apply, enabling VFR light GA flights to operate under VFR in much poorer weather conditions than would be applicable to CAT flights in the same airspace. In poor weather conditions and close to cloud, GA flights may operate as VFR flights and reliant on 'See and Avoid' whilst adjacent CAT flights may well be in IMC.

6.5.4. Transponder Mandatory Airspace may provide a 'safety net' to CAT IFR flights by virtue of TCAS enabling. However, ANSPs should not include 'safety nets' in determining the safety of the ATM arrangements.

6.5.5. LSA has carefully considered the application of Transponder Mandatory Airspace to Class G airspace in the vicinity of LSA and has concluded that it would not provide a suitable means of achieving the reduction in risk and efficiency objectives to a suitably robust level and, furthermore, an additional disadvantage is that permanent 'special arrangements' would need to be made for the significant proportion of locally based aircraft that are not transponder equipped. Consequently, this option is precluded from adoption.

[12] Assuming the aircraft transponder is as serviceable as the pilot believes it to be. With no associated communication requirement there is no obligation on the pilot to verify transponder serviceability.

6.6. Option 2C: Class G airspace with RMA and Transponder Mandatory Airspace

6.6.1. A combination of RMA plus Transponder Mandatory Airspace within uncontrolled airspace would provide an airspace environment within which the presence, identity (through allocation by ATC of individual squawks or by Mode S) and intentions of all aircraft would be known. Entry into the airspace would not be conditional upon ATC clearance or agreement.

6.6.2. However, it would not provide an assurance that ATC could adequately deconflict traffic by tactical management of the VFR GA flight because pilots would not be compelled to comply with ATC instructions aimed at resolving conflict efficiently. While it is acknowledged that many pilots would co-operate in resolving conflictions this is by no means assured. Deconfliction would continue to rely on the provision of ATSOCAS Deconfliction Service to the IFR CAT flight by manipulation of its flight path as the primary deconfliction means without any assurance of being able to manage the GA VFR flight activity as a tactical alternative. Inevitably this would result in greater track extensions for IFR CAT flights than would be needed in a Class D airspace regime, resulting in continuing adverse environmental effects and delays.

6.6.3. As a consequence, neither overall ATC workload nor cockpit workload in the critical stages of flight would necessarily be reduced. Indeed, workloads are likely to be increased by the additional requirement to gain pilots' co-operation and agreement to a proposed course of action leading to an increase in RTF loading. It should be noted that 'high RTF loading' was cited as a major objection point raised by the GA and S&R communities as a concern to participating in any airspace arrangements (controlled or otherwise) that may be established. LSA ATC would retain the responsibility for deconflicting IFR CAT flights and GA activity in an uncontrolled airspace environment as it does now, thereby reducing the objective of a more streamlined interface with LTC Sectors and the ability to achieve improved flight profiles for CAT flights.

6.6.4. Both RMA and Transponder Mandatory Airspace would impose significant operating constraints on airspace users in seeking to obtain 'permission' for non-compliant access and significant ATC workload in arranging, and subsequently taking cognisance of, those aircraft granted non-compliant access.

6.6.5. Whilst taking due regard of current CAA Policies regarding 'enhancements' of basic Class G uncontrolled airspace which are aimed at introducing knowledge of airspace occupancy but without giving ATC the ability to control the airspace, LSA has concluded that, on balance, any 'uncontrolled airspace' solutions would not meet the LSA safety and operational objectives nor the CAT airline operators strong preference to operate wholly within controlled airspace and should not be adopted for the long-term.

6.7. Post Sponsor Consultation Review

6.7.1. Whilst LSA had considered and rejected the application of RMA and/or Transponder Mandatory Airspace enhancements to Class G airspace at the Project Definition and Post-Focus Group stages of the airspace development, the significant opposition to any controlled airspace solution by the GA and S&R aviation communities at the Sponsor Consultation stage, coupled with the new CAA emphasis on non-controlled airspace solutions, has caused LSA to review and consider this option once again.

6.7.2. None of the evidence presented was compelling enough for LSA to be persuaded that this would be a safe and effective change option to local airspace arrangements. On balance, LSA has again concluded that Class G airspace with RMA and/or Transponder Mandatory Airspace application would not adequately meet the LSA requirements for a safe and efficient managed airspace solution for current and projected CAT traffic levels and it would not provide a means to streamline the LSA/LTC operational interface.

6.8. Option 3: Class E controlled airspace

6.8.1. Class E controlled airspace enables VFR flights to enter and operate within the airspace without reference to ATC. Thus, for flights which determine themselves to be in VMC then the controlled airspace effectively assumes the status of uncontrolled airspace, except that under the application of SERAS the ICAO Annex 2 Standard flight visibility and distance from cloud minima would prevail irrespective of aircraft size and speed.

6.8.2. ICAO Standards[13] together with CAA Policy[14] preclude the application of Class E airspace classification to Control Zones. Thus, any use of Class E classification would be confined to CTA airspace surrounding the core CTR.

6.8.3. Until 2013 CAA Policy did not favour the application of Class E airspace in the UK. Indeed it was the intention of the CAA[15] for Class E to be progressively replaced where appropriate within the UK FIRs by airspace classes that are considered to be better suited to the operational conditions associated with the airspace structures in question. Thus the initial development of the LSA ACP, prior to the revised Policy Statement of August 2013, was made against the background of a presumption against the use of Class E airspace.

6.8.4. With the changed emphasis to allow the application of Class E airspace, together where appropriate, with RMA and/or Transponder Mandatory Airspace application in situations where Class D controlled airspace could not be justified, has caused LSA to review, once again, the possible use of Class E classification.

6.8.5. However, from the outset it must be acknowledged that the application of Class D airspace classification has been the standard, indeed the Policy, classification of controlled airspace

[13] ICAO Annex 11 paragraph 2.6
[14] CAA Policy Statement 1 August 2013
[15] CAA Policy Statement on the Application of ICAO Airspace Classification in the UK July 2009 and August 2010.

in the vicinity of Airports in the UK for many decades and pilots throughout the airspace user community are totally familiar with this arrangement. A new application of Class E classification in the Airport environment arising from a change of Policy has the potential of causing confusion to UK-based pilots who are unfamiliar with its application. Certainly, when discussing airspace classification with airline pilots, there is difficulty in grasping the concept of 'controlled airspace' in which a large proportion of the traffic would not be 'controlled' unless it chooses to be.

6.8.6. Thus the options considered arising from the changed Policy emphasis comprise:

- Class E CTA segments;
- Class E CTA segments with RMA notification;
- Class E CAT segments with Transponder Mandatory Airspace notification;
- Class E CTA segments with both RMA and Transponder Mandatory Airspace notification.
- A mixture of Class D CTA segments with Class E segments.

6.8.7. Class E CTA segments

6.8.7.1. A substantial proportion of any airspace necessary to contain IFPs and associated flight paths beneath the LTMA would inherently be configured as CTA if the principle of minimising the size of the CTR is to be upheld. Whilst the CAA encourages the application of larger CTRs over CTAs with a low base altitude, the responses to the consultation demonstrated that a commensurately larger CTR would be unacceptable to the GA and S&R aviation community in this case.

6.8.7.2. In order to contain IFPs and flight paths within controlled airspace as specified in the regulatory requirements, CTA segments with base levels 1500ft, 2500ft, 3500ft and 4500ft amsl, and with upper limits contiguous with the LTMA above are necessary. If the CTA segments were designated as Class E airspace then it would comprise the major portion of the required controlled airspace.

6.8.7.3. Thus, the major portion of the flight paths of CAT aircraft at the critical stages of flight would continue to take place in airspace in which the application of 'control' was optional and dependent on the determination of flight meteorological conditions by the GA pilot. The pilots of IFR CAT flights would have no assurance that they were operating within a known and managed airspace environment, notwithstanding the airspace designation as 'controlled airspace'.

6.8.7.4. Furthermore, ATC would have no knowledge as to whether 'unknown' radar responses were actually within the Class E CTA or operating below it and would need to react to such unknown traffic responses as though it was uncontrolled airspace, albeit the radar service would be designated as Radar Control rather than ATSOCAS. Additionally, of course, those

aircraft which do not generate good radar responses could still operate within the CTA without reference to ATC so long as the pilot considered that he was operating in VMC.

6.8.7.5. Given that the airspace would remain highly populated with GA and S&R airspace activity, which would deem itself to be in VMC, then the application of Class E airspace would be contrary to the basic justification for establishing a known and managed airspace environment.

6.8.7.6. Thus, to all intents and purposes, the application of Class E controlled airspace would not meet the LSA safety and airspace efficiency objectives and, moreover, is likely to have the potential of misleading pilots into believing that the degree of airspace protection was greater than it actually was.

6.8.7.7. A suggestion arising from Sponsor Consultation was that the particular segment of CTA provided for the offshore holding pattern should be designated as Class E airspace because the instances of holding would be rare and the volume of airspace necessary to meet the regulatory requirement for holding pattern containment was significantly larger than the nominal flight path of the holding aircraft. The LSA project team considered this proposal as rational and worthy of consideration and the subject was debated judiciously. However, LSA has taken the following aspects into account:

- Whilst the probability of holding is accepted as being low, nonetheless when it is necessary it remains a period of high cockpit workload and the distraction of attempting to 'See and Avoid' light aircraft whilst carrying out holding manoeuvres would be an unwelcome cockpit workload;
- Radar vectoring holding traffic to avoid unknown traffic (within or below the CTA) would be a complex matter with associated difficulties of re-establishing the aircraft in the hold once traffic avoidance had been achieved;
- Following LSA participation in NATS LAMP simulations it became clear that the 'Holding Area' airspace volume necessary to meet the regulatory requirement for holding would also be necessarily utilised for containment of departing traffic climbing through the holding levels under radar direction;
- The higher base level of this CTA segment would make it unlikely to be routinely utilised by the lighter end of the GA and S&R aviation community; those GA flights requiring access to this segment would most likely be familiar with, and amenable to, Class D airspace requirements;
- The application of different airspace classifications across different segments of the controlled airspace entity would have the potential to confuse both the GA and S&R aviation community and the CAT aviation community and would add unnecessary complexity to the ATC task.

6.8.7.8. Thus, LSA has considered the application of Class E airspace to the segments of the proposed Southend CTA as a whole or in part and has concluded that it would not meet the safety and airspace efficiency requirements and, furthermore, may have the potential

to confuse some elements of the aviation user community. Therefore, this option was not pursued further.

6.8.8. Class E CTA with RMA and/or Transponder Mandatory Airspace

6.8.8.1. LSA has carefully considered the application of Class E airspace with one or other or both of the perceived enhancements of RMA and Transponder Mandatory Airspace. This was done both on publication of the revised CAA Policy Statement of August 2013 as the pre-Sponsor Consultation airspace configuration was under development and again in the light of the responses to the Sponsor Consultation (see Post Sponsor Consultation airspace reviews; CL 4835-DOC 125 to 131).

6.8.8.2. On balance, LSA has concluded again that 'Enhanced' Class E airspace would not meet the required reduction in risk or airspace efficiency objectives in high-density, low-level, airspace with a complex mix of IFR passenger carrying CAT flights and predominantly VFR GA and S&R manoeuvring flights where formal 'control' of the latter could not be assured. LSA has concluded, therefore, that this option should not be adopted. Moreover, it is considered that a mixture of Class D airspace for some segments with 'Enhanced' Class E for other CTA segments would be potentially confusing to both the airspace user community and to ATC and is therefore unacceptable.

6.9. Option 4: Class D controlled airspace

6.9.1. At the outset of this airspace development project the application of Class D controlled airspace was the standard and long-standing Policy for those situations where it was considered necessary to establish controlled airspace in the vicinity of Airports in the UK. As the project has progressed, and the Policy emphasis on the application of the ICAO Airspace Classification System in the UK has shifted, so LSA has considered other, potentially less restrictive, applications as detailed above.

6.9.2. Notwithstanding the GA and S&R objections to any form of controlled airspace, Class D airspace nonetheless is not an 'exclusion zone' to GA and S&R activities. Access can, and will, be routinely granted to VFR and IFR flights of all airspace user categories in a controlled and managed manner, subject only to clearance from ATC and compliance with ATC instructions.

6.9.3. Whilst ATC provides standard separation between IFR flights in Class D airspace, between VFR and IFR flights or between VFR flights ATC resolves conflict by passing traffic information until the conflict is resolved or, more likely, manages the traffic flow or operation of aircraft so that conflict does not occur. The latter technique normally involves no more than a minor or temporary limitation on the activity or routing of a particular aircraft.

6.9.4. Whilst the normal method of operation is for pilots to be in two-way radio communication with ATC in order to obtain clearance and comply with instructions, nonetheless provision can be made for non-radio aircraft to access the airspace either on a routine (by LoA) or individual basis.

6.9.5. However, it is acknowledged that a number of GA and S&R pilots prefer not to operate in controlled and managed airspace, notwithstanding that they could do so if desired. LSA considers that the proposed airspace configuration detailed later in this ACP provides a suitable and safe operating environment both for those pilots who are happy to operate in a known and managed airspace environment and for those who prefer to remain outside controlled airspace.

6.9.6. Class D airspace does not require the mandatory carriage or operation of transponders in aircraft. Thus, there are no aircraft equipage issues for GA and S&R airspace users over and above their current equipage to obtain access to the CTR/CTA. However, the fact that all aircraft operating in the airspace are known to ATC and that pilots must comply with instructions enables lower separation minima to be applied than those applicable to an uncontrolled airspace environment permitting more efficient use of airspace.

6.9.7. At each review of the proposed airspace classification and configuration that has taken place as the project has progressed, LSA has consistently concluded that Class D controlled airspace remains the most appropriate classification to be applied in the vicinity of LSA.

6.9.8. Impact of SERA on Class D airspace utilisation

6.9.8.1. Both at the Focus Group Stage and subsequently at formal Sponsor Consultation, the GA and S&R aviation community expressed objection to the proposed introduction by the CAA of the SERA Regulations into UK airspace and the impact that this would have on light aircraft operations in controlled airspace below 3000ft in poor weather conditions (see footnote 9 to paragraph 6.3.1). A number of consultees considered that the LSA airspace project should be abandoned because of the perceived detrimental impact and the Policy issues surrounding the application of SERA.

6.9.8.2. However, LSA has taken the view that SERA is a national issue to be resolved between the CAA and the GA and S&R aviation communities and that the outcome would apply nationally across all CTR/CTA applications. The justification for introduction of the LSA CTR/CTA remains sound whatever the outcome of the CAA deliberations and the LSA case should not be held up to be a 'special case', or unjustified, simply because of the SERA. LSA is content that whatever the conclusion of the SERA debate, the resultant 'rules' would be equally acceptable to Southend ATC as to other ANSPs on a national basis.

6.9.8.3. In poor weather conditions, access to the Southend CTR by means of Special VFR clearance would remain available on the same basis as it would be under the pre-SERA airspace regulation.

6.10. Option 5: Class C or Class A airspace

6.10.1. In consideration of all possible options for the airspace classification to be applied to the proposed Southend CTR/CTA, LSA briefly considered the application of Class C or Class A classification.

6.10.2. However, LSA rapidly concluded that, whilst the overlying LTMA fully justified its Class A status, the application of Class C or Class A status to the Southend CTR/CTA would be unnecessarily restrictive and would preclude access to the airspace to a substantial proportion of the GA and S&R aviation communities. Therefore, neither of these classifications are proposed.

7. Development of the airspace configuration

7.1. Overview

7.1.1. This Section of the ACP outlines the development of the proposed controlled airspace configuration prior to Sponsor Consultation and the adaptation of the configuration following the response to the Sponsor Consultation. The final configuration presented in this ACP is detailed at **Section 8**.

7.1.2. This Section also details the external influences that have affected the development of the proposed controlled airspace configuration, including the introduction of the NATS LAMP Project and the changed emphasis (commented on in **Section 6**) of some airspace regulatory requirements to the project.

7.2. Initial airspace development

7.2.1. At the outset of the project, as a consequence of the CAA's PBN Policy, an airport user survey was conducted to ascertain the level of RNAV equipage and capability of CAT airspace users. This was necessary to ensure that aircraft operators would be able to operate on RNAV-1 defined airspace procedures such as SID and STAR procedures. Another anticipated outcome of the survey was whether conventional navigation procedures would need to be established in addition to RNAV procedures or not.

7.2.2. It was determined that the majority of airline operators were equipped and approved for RNAV-1, or better, operations in European terminal airspace. The proportion of compliant operators was sufficiently high to conclude that an alternative array of non-RNAV SID and STAR procedures would not be necessary for the interim period before RNAV equipage becomes mandated by European Union (EU) Implementing Rules (IR). In the interim pre-mandate period, non-RNAV-1 approved aircraft would, when necessary, be issued with individual ATC clearances.

7.2.3. The initial airspace case and outline proposals were discussed with CAA Directorate of Airspace Policy (DAP) staff at a formal Framework Briefing on 27 February 2013 in accordance with CAP725. An embryo Framework Document [CL-4835-ACP-012] was presented and discussed, DAP provided help and guidance with a thorough briefing of the Airspace Change Process. The Minutes of the Framework Briefing are submitted separately [CL-4835-MIN-13].

7.2.4. Subsequently, a close dialogue has been maintained with the CAA DAP staff throughout the development of this ACP. Guidance has been sought where appropriate and policy advice has been freely offered throughout the ACP development.

7.2.5. Furthermore, DAP staff maintained oversight of the various discussions between LSA and NATS with respect to the emerging LAMP airspace arrangements and have provided advice in this area.

7.3. Operational requirements to be met

7.3.1. At the outset of the project a list of operational requirements was developed which LSA would require the airspace arrangements to achieve. These were based broadly on the airspace design principles detailed in CAP725 and included, inter alia:

- Development of a known and managed airspace environment to ensure adequate protection of CAT passenger traffic inbound to and outbound from LSA and other aircraft operating in the vicinity of LSA;
- Containment of existing IFPs to meet the regulatory requirements (see paragraph 7.3.4 below);
- Be of sufficient dimensions to fully contain vertical and lateral flight activity with regard to expected navigation performance and manoeuvrability in both radar and non-radar managed environments;
- Development of SID and STAR procedures providing direct linkage to/from the LTMA Airways system;
- Establish a terminal holding pattern away from the LSA overhead to provide a minimum of three discrete holding levels for LSA traffic;
- Ensure equitable access to as many classes of airspace user as practicable;
- Reflect current UK PBN policy and comply with other appropriate CAA policies;
- Take due regard of the environmental impact of aviation on communities and, wherever possible reduce the impact;
- Take due regard of known windfarm developments and other areas of radar clutter;
- Take due regard of known future airspace developments in the eastern LTMA areas.

7.3.2. A provisional controlled airspace configuration was developed based on:

- The operational requirements outlined above;
- The regulatory requirements for the configuration of controlled airspace and the containment of IFPs as detailed in CAP725 and CAP778;
- The knowledge base within the local ATC team of local airspace usage and areas of concern,
- Consideration of options for reconfiguration of IAPs.

7.3.3. In the latter case, consideration was given to reconfiguration of the LSA IAPs to raise the glide-path intercept height from 1500ft to 2000ft ALT to enable CTA bases to be specified at 1500ft amsl. However, at this stage of the ACP development, the option was rejected by LSA on the basis of the potential to delay the project, and the commercial impact resulting from the significant additional design and regulatory costs of developing a new array of IAPs. Furthermore, advice given at the Framework Briefing indicated that a controlled airspace configuration based on the existing IAP configuration would be acceptable. Thus,

the provisional controlled airspace configuration was based on the regulatory requirements for containment of the existing IAPs.

7.3.4. With respect to the containment of IFP Primary Areas, as derived from ICAO PANS-OPS and other containment requirements, the following IFPs and other requirements were considered relevant to the airspace design for runways 06 and 24:

- IAPs from SND NDB/DME to ILS/DME and LOC/DME (Base Turn procedures);
- Direct Approach IAPs;
- RNAV IAPs;
- Radar vectored routing of arriving traffic (taking due regard of NATS Inter-Sector and Inter-Unit separation and interface requirements);
- SND NDB holding pattern up to 3500ft amsl;
- Preferred Departure Routes (PDRs), as notified, via EVNAS (LAM/BPK), CLN, DET (LYD/DVR/SAM), and possible adaptation as future SID procedures;
- Thames Gate agreed departure procedures to the south;
- Provisional future SID procedures (to the extent possible) for post-LAMP Phase 1a LTMA configuration);
- STARs via SPEAR (as published for LCY);
- Future Remote (Offshore) Terminal Holding Pattern in the vicinity of TRIPO;
- Provisional STARs to new Terminal Holding Pattern (to the extent possible) for the post-LAMP Phase 1a LTMA configuration;
- Radar vectored routing of departing traffic (taking due regard of NATS Inter-Sector and Inter-Unit separation and interface requirements);
- Missed Approach Procedures.

7.4. Focus Groups

7.4.1. As recommended in CAP725, LSA established Focus Groups from a cross-section of those who may be affected to consider the initial proposal and, where appropriate, suggest alternatives for consideration and to identify areas of concern. The Focus Group consultation is described in **Part E** of this ACP. Notes and Report of the Focus Group stage are submitted separately under various covers [CL-4835-DOC-63 to 66 and 71].The Focus Group stage of the process enabled LSA to gain early knowledge of likely areas of contention with airspace user or environmental groups and to adapt the early design proposals to reduce potential opposition.

7.4.2. In this case substantial opposition to the early proposal arose from elements of the GA and S&R airspace user community, including individual aviators, flying schools, aerodrome operators and an aircraft manufacturer. All considered the 'imposition' of controlled

airspace to be a serious curtailment of their freedom of airspace access and utilisation, notwithstanding that the proposed airspace configuration would allow access by all classes of airspace user, including (by arrangement) non-radio operations. Throughout the airspace development process the sponsor of the change is required to take a balanced approach to the competing needs of the different elements of the airspace user community, together with the equally competing environmental objectives.

7.4.3. Following the Focus Group discussions the LSA airspace development team undertook detailed reviews of each area of the proposed airspace configuration to determine whether the proposed airspace could be reconfigured or reduced in dimensions and volume to mitigate, as far as practicable, the concerns raised by the GA and S&R Focus Group participants.

7.4.4. The detailed Reviews comprised:

- The CTR/CTA configuration to the south of the River Thames where it interacted with Stoke Microlight Airfield and Rochester Airport;
- The proposed western boundary of the CTR;
- The controlled airspace requirements to the west and north-west of LSA in the vicinity of Hanningfield Reservoir;
- The proposed vertical interface with the overlying LTMA Class A airspace;
- The configuration of the proposed offshore holding pattern and associated airspace configuration;
- The proposed controlled airspace configuration to the south-east, including the interaction with Manston operations;
- The need to provide containment for future SID and STAR procedures;
- The handling of arrivals and departures when the D136/138 complex is not active.

7.4.5. Documentation of the Post-Focus Group Reviews is provided under separate covers at CL-4835-DOC-067; -068; -069 and -073. It should be noted that some of the review areas detailed above have been combined in the Reports. In each case, in taking a balanced approach, the LSA airspace development team were able to reduce the overall volume of new controlled airspace required. Where there was some erosion of the CAAs regulatory requirements potential mitigations were developed and discussed with the CAA. However, in some areas it was not possible to substantially reduce the dimensions of the proposed controlled airspace.

7.5. NATS LAMP Project

7.5.1. At the outset of the LSA airspace development project the NATS LAMP was very much a future consideration for implementation in 2018 or beyond and of which LSA would take ‘due regard’ so far as the LAMP concepts were known. It was not expected to influence the LSA airspace configuration in the short term.

7.5.2. However, in January 2013 the CAA and NATS jointly announced that, due to potential changes in airspace throughout Europe, LAMP would be phased, with LAMP Phase 1a, which would include changes for LCY traffic, being introduced in 2015. Therefore, the emerging LAMP concepts and arrangements became a new, direct, and more immediate influence on the LSA airspace development.

7.5.3. Initially, consideration was given by LSA management to delaying the LSA airspace project until after LAMP Phase 1a was in place. However this option was rejected because it would delay the flight safety improvements which needed early and prompt attention for the increasing number of CAT passenger movements at LSA. Furthermore, although the proposed implementation of LAMP Phase 1a was to be 'during 2015' there was no assurance that it would be accomplished in that timescale and consultation had not taken place.

7.5.4. Consequently, from early 2013, the LSA airspace development team has been working closely with the NATS LAMP development team to ensure that LSA airspace development proposals would remain compatible with the future LTMA arrangements and that the emerging LAMP airspace management concepts and designs would reflect and facilitate continued traffic growth at LSA. Similarly, the LSA airspace development team has worked closely with LTC Operations, and will continue to do so, in developing the airspace configuration and arrangements detailed in this ACP.

7.5.5. Thus, the LSA airspace development has been adapted to ensure that it remains compatible with both the existing LTMA route structure and ATC operation and the emerging Post-LAMP Phase 1a operation.

7.5.6. NATS has, in the meantime, carried out its own separate Sponsor Consultation on the outline LAMP concepts and proposals. However, the NATS consultation did not specify definitive flight paths for SID, STAR and IAPs for either LCY or LSA traffic as they were still under development and may have been influenced by the outcome of their conceptual consultation.

7.5.7. The detailed effect of the emerging LAMP concept and airspace arrangements on LSA departure and arrival routes and airspace configuration, so far as the LAMP is currently developed, are detailed later in this ACP.

7.6. Phased Approach

7.6.1. As a consequence of the emergence of the LAMP as a major influence on the LSA airspace configuration, LSA took the decision to adopt a Phased Approach to the introduction of the LSA controlled airspace. Advantages were identified with this approach following discussions with the CAA.

7.6.2. Stage 1 of the LSA controlled airspace project would reflect the 'as-is' arrangements and interfaces with the existing LTMA configuration and LTC sectorisation for the interim 'Pre-

LAMP Phase 1a' period. The existing PDRs would be retained, without the introduction of formal SID procedures, whilst the definitive LAMP requirements were still under development. This approach has been provisionally agreed with the CAA DAP and would obviate the need for a second round of formal SID procedure design and adaptation. In addition the existing STAR procedures (as incorporated in the LCY STARs) would remain, focussed on SPEAR, and the management of arriving flights would remain unchanged other than being contained within controlled airspace.

7.6.3. However, within Stage 1 it was decided that the proposed Offshore Holding Pattern (future Terminal Arrival Fix) and its associated controlled airspace would be formally introduced in order to implement the LSA controlled airspace itself as a single package. The benefits of this would be to:

- Facilitate tactical use of the holding pattern for traffic inbound from the east should holding become necessary;
- Avoid congestion around SPEAR;
- Gain operational experience of the integration of departing and arriving traffic in a controlled airspace environment in this area.

7.6.4. For Stage 2 of the LSA ACP, co-incident with the implementation of LAMP Phase 1a, formal SID procedures would be designed in accordance with CAP778 and CAP785 and implemented to reflect the definitive LAMP LTMA route structure to the south of LSA. Should any changes be required to the nominal ground tracks associated with the current PDR and Thames Gate then these would be subject to a second ACP and consultation to the extent determined in discussion with the CAA.

7.6.5. Similarly, for Stage 2 of the LSA ACP, the formal STAR procedures through the LTMA to the Offshore Hold would be introduced by NATS, in accordance with CAP785 and the implementation protocols agreed between NATS and the CAA.

7.6.6. At or after Stage 2, RNAV IAPs (or ILS Transitions) would be introduced by LSA to facilitate RNAV-based arrival techniques to be used from the STARs and Offshore Terminal Arrival Fix/Holding Pattern and to reflect the descent profiles necessary for arrivals to runway 06 to ensure separation from LCY departing traffic.

7.7. Consultation

7.7.1. Post the Focus Group Stage and the early discussions with NATS (following the emergence of the LAMP Project) the initial airspace configuration was adapted to reflect:

- The regulatory requirements for containment of IFP primary areas as derived from ICAO PANS-OPS and as specified in CAP725;
- The LAMP airspace concept and embryo airspace arrangements, so far as they had been developed;

- The concerns of the GA and S&R Focus Group participants as far as was practicable.

7.7.2. The resulting controlled airspace configuration was then submitted to formal Sponsor Consultation as specified in CAP725 and detailed in **Part E** of this ACP. For ease of reference the proposed airspace configuration as submitted to Sponsor Consultation is shown at **Appendix E.**

7.7.3. The conduct of the Sponsor Consultation itself is detailed at **Part E** of this ACP. The Report of the Sponsor Consultation, including themes and issues of objection together with the LSA Comment, is submitted separately. [CL-4835-RPT-160]

7.8. Post Sponsor Consultation Review

7.8.1. The groundswell of opposition to the proposed controlled airspace, principally from the GA and S&R aviation communities, arising from the Sponsor Consultation prompted LSA to undertake a fundamental review of all aspects of the proposal.

7.8.2. Notwithstanding the objections, LSA remains convinced that the basic safety argument for the provision of controlled airspace remains sound. Indeed, it could be argued that the case is enhanced by the results obtained from the Sponsor Consultation indicating the sheer volume of uncontrolled flight activity that takes place in proximity to the flight paths of IFR CAT flights. Furthermore, the additional airspace incidents that have arisen since the initiation of the project further confirm the requirement for revised airspace arrangements and the proposed CAS protection.

7.8.3. In early January 2014, subsequent to the Sponsor Consultation period, discussions with CAA staff indicated that a less prescriptive approach to the dimensions of controlled airspace (necessary to comply with the extant regulatory requirements) was under consideration. A revised Policy Statement was issued on 31 January 2014.

7.8.4. Furthermore, by this time, the NATS LAMP airspace requirements had become more clearly defined, although the differing timetables for implementation of the two projects could not be aligned due to the urgency, on grounds of flight safety, afforded to the LSA project. LSA participation in NATS LAMP real-time simulations and the progress of the ongoing discussions between LSA and NATS staff had also revealed areas where the airspace configuration, as developed, may need to be further modified in the light of practical experience.

7.8.5. Thus, between January and April 2014 the LSA airspace development team has undertaken a root and branch review of all aspects of the proposed controlled airspace configuration, including consideration once again as to whether a non-controlled airspace solution would be appropriate, in order to ameliorate, to the maximum extent practicable, the concerns of the GA and S&R airspace user community whilst still providing an adequate level of airspace risk reduction for the growing number of CAT passenger carrying flights.

7.8.6. The Post-Sponsor Consultation Airspace Reviews are detailed in separate supporting documents CL-4835-DOC-125 to 131 and the resulting revised airspace configuration is shown at **Appendix F**.

7.8.7. In particular, LSA has changed its position with regard to the configuration of IAPs. Revised IAPs will be commissioned and introduced in accordance with the requirements of CAP785 which will facilitate a reduced controlled airspace footprint at the surface in order to ameliorate, as far as practicable, the safety and environmental concerns of the GA and S&R aviation community with regard to potential 'Choke Points' around the periphery of controlled airspace.

7.8.8. It is acknowledged that in a number of areas the resulting controlled airspace configuration does not fully meet the regulatory requirements for the full containment of the IFP Primary Areas as specified in CAP725 or the more relaxed approach to containment outlined in the Policy Statement of 31 January 2014. However the LSA airspace development team has taken a pragmatic and objective approach and has developed appropriate Safety Arguments to mitigate those areas where the requirements are not met in full. These are detailed in **Section 12** (Safety Management) of this ACP.

7.8.9. **Section 8** below provides a detailed description of the dimensions and function of each CTR/CTA segment proposed in this ACP. Coordinate details and other geographic references specified in CAP725 are given at **Appendix G**.

7.9. Summary

7.9.1. LSA has carried out a comprehensive airspace development process in accordance with the provisions of CAP725 in order to establish and justify the case for the provision of controlled airspace to enhance the protection of passenger carrying CAT flights in the critical stages of flight and of other aircraft operating in the vicinity of LSA.

7.9.2. LSA has taken due regard of, and acted upon the views of airspace users and other stakeholders who may be affected by the LSA proposals and has acted to reduce the overall volume of controlled airspace proposed.

7.9.3. LSA has also taken due regard of, and acted upon, other external influences on the airspace development, including the emergence of the NATS LAMP Project and various changes to Policy or the application of Policy in the CAA.

7.9.4. The resulting proposed airspace configuration represents a fine balance between the competing requirements of the various aviation communities, including the needs of the GA and S&R communities, whilst providing controlled airspace protection to the increasing number of CAT flights using the Airport.

8. Proposed airspace configuration

8.1. Overview

8.1.1. This Section of the ACP provides a textural description of the individual segments of proposed controlled airspace together with a description of their function in containing IFP Primary Areas, radar directed routing or other flight profiles. It should be read in conjunction with the Post-Sponsor Consultation Review documents [CL-4835-DOC-126 to -131] which provide details of the development of the CTR/CTA configuration as a consequence of responses to the Sponsor Consultation and the resulting decision by LSA to commission revised IAPs.

8.1.2. In a number of areas the proposed controlled airspace does not fully meet the IFP containment requirements specified in CAP725 (IFP Primary Areas as derived from ICAO PANS-OPS Volume 2) or the more relaxed requirements outlined in the CAA Policy Statement dated 31 January 2014. Where deficiencies arise they are detailed in this Section. A Safety Argument in respect of each non-compliance is detailed in **Section 12** (Safety Management) of this ACP. Diagrams showing the configuration of the airspace referenced to the IFP containment areas for the proposed revised IAPs and other IFPs are depicted in the Post-Sponsor Consultation Review documents submitted separately [CL-4835-DOC-126 to -131].

8.1.3. The whole of the proposed new controlled airspace is to be contiguous with the overlying LTMA or Clacton CTA as appropriate. The majority of the overlying LTMA has a base level of 3500ft amsl, although to the east and southeast the base of the LTMA and Clacton CTA rises to 4500ft, 5500ft amsl and FL85. At an early stage of the proposal development [see Post-Focus Group Review CL-4835-DOC-73] it was agreed that establishing a uniform upper limit of 3500ft amsl for the CTR and lower CTA segments, overlaid where necessary with separate CTAs to fill in the gap between 3500ft amsl and the higher LTMA/Clacton CTA would be a 'tidier' configuration than having numerous CTR segments with stepped upper limits and a greater number of CTA segments with the same base level and differing upper limits.

8.1.4. WGS-84 coordinates and other geographic references for the proposed CTR and CTA segments are detailed at **Appendix G.**

8.1.5. All new proposed controlled airspace detailed in this Section is to be Class D airspace throughout as argued in previous Sections of the ACP.

8.1.6. The hours of operation of the proposed controlled airspace are H24. (UK AIP AD2.EGMC-1; Section EGMC AD2.3 Item 7 refers). (Note: Although the hours of ATS are detailed at EGMC AD2.18 as 0630 – 2230 (winter); 0530 – 2230 (summer), ATS is notified as PPR basis outside these hours. ATC is, in fact, manned and available H24. The ATZ is already notified as H24.)

8.1.7. It should be noted that the reconfiguration of the proposed CTR/CTA as a result of the Post-Sponsor Consultation Review has resulted in renumbering the CTA segments as a consequence of 'joining up' two segments which were separately numbered in the configuration presented to Sponsor Consultation. Thus there is disparity between the CTA numbering depicted at **Appendix D** and that of the definitive proposed configuration depicted at **Appendix F** and detailed at **Appendix G**.

8.2. Control Zone (CTR): Surface to 3500ft amsl

8.2.1. The CTR extends from the surface to 3500ft amsl.

8.2.2. To the southwest of LSA (runway 06 approach) the CTR extends to an arc of radius 7.5NM centred on the runway 06 threshold. To the northeast (runway 24 approach) the CTR extends to an arc of radius 10.0NM centred on the runway 24 threshold. Laterally the CTR extends to 5NM either side of the extended runway centreline.

8.2.3. At the southern extremity a small segment of the CTR over the Isle of Grain is 'cut back' to provide ease of access to Stoke microlight aerodrome from the west by means of a prominent line feature. (Stoke aerodrome itself lies just outside the CTR.)

8.2.4. A further segment of the CTR to the south is proposed as a Local Flying Zone (LFZ) to allow autonomous (but conditional) operations up to 1500ft amsl by Stoke Aerodrome to be established through a LoA. The Stoke LFZ is detailed later in this Section.

8.2.5. At the northern extremity of the CTR the 10.0NM radius arc is cut back to an alignment based on Tillingham Village and Ramsey Island (both outside the CTR) to increase the spacing of the CTR from Bradwell Restricted Area and to facilitate ease of access to the Dengie Peninsular by non-radio or non-participating aircraft.

8.2.6. The CTR encompasses those parts of the revised IAPs which lie below 2000ft ALT, the climb profiles of departing aircraft to 2000ft, the SND NDB holding area to 3500ft together with additional airspace considered necessary to facilitate radar vectoring of traffic below 2000ft ALT in accordance with the levels specified in the Surveillance Minimum Altitude Chart (SMAC) at AD2-EGMC-5-1.

8.2.7. A number of small airstrips are embedded within the CTR at Tillingham, St Lawrence, Barling, Bradwell, and Canewdon. As detailed in **Part 5** of the Post-Sponsor Consultation Airspace Reviews [CL-4835-DOC-128] it did not prove possible to cut-back the CTR to place Tillingham and St Lawrence airstrips outside the CTR. It is proposed that LoAs are established to facilitate operations to and from these airstrips. Draft LoAs, as they currently stand, are submitted separately.

8.2.8. To the northeast, consideration has been given to a windfarm turbine array which straddles the runway 24 final approach track between 7.1 and 8.8NM from threshold. In order to allow an acceptable buffer between aircraft vectored on base leg over or close to the windfarm clutter it is desirable that the windfarm footprint is encompassed within the

CTR (a known traffic environment) in order that appropriate separation or traffic information can be given against transiting traffic. CAA Policy accepts that CTR dimensions greater than the minimum where there are sound operational reasons for a larger CTR. LSA believes that the certainty of windfarm clutter problems from this site represents a valid justification for increased CTR dimensions to 10.0NM from threshold, based on the operational requirement.

8.2.9. The development of the CTR configuration is described in greater detail in the Post-Sponsor Consultation Review documents [CL-4835-DOC-126 to -131].

8.2.10. In conclusion, the CTR dimensions detailed above represent a substantial reduction in the CTR dimensions submitted to Sponsor Consultation. This has been enabled by the LSA decision to invest in revised IAPs with a higher glide-path intercept altitude (2000ft) thereby taking the base-turn segment of the IAPs out of the need for containment down to the surface.

8.3. Control Area -1 (CTA-1): 1500ft to 3500ft amsl

8.3.1. CTA-1, 1500ft amsl to 3500ft amsl, provides a 'collar' of CTA around the CTR.

8.3.2. LSA acknowledged the CAA preference stated in Policy Statement of 31 January 2014 that CTA base levels should be not less than 1500ft Above Ground Level (agl) and that a larger CTR would be preferred in order to ensure that CTA base levels are not below 1500ft agl. However, LSA notes from the responses to the Sponsor Consultation the resistance of the GA and S&R aviation community against the larger CTR necessary to contain the existing IAPs with glide-path intercept altitude 1500ft amsl. LSA has taken steps to reduce the size of the CTR by investing in new IAPs with a higher glide-path intercept altitude at 2000ft ALT; thereby requiring a CTA base level of 1500ft amsl to provide the required 500ft vertical containment. LSA argues, in the Post-Sponsor Consultation Review documents [CL-4835-DOC-125 and 126], that the use of 1500ft amsl is acceptable in this case and that the GA and S&R aviation community view should take precedence.

8.3.3. Laterally (on the north-western and south-eastern sides of the CTR) the width of CTA-1 is 1.5NM. To the north east of the CTR, CTA-1 extends to an arc of radius 12.0NM centred on the runway 24 threshold. To the south-west of the CTR, the outer boundary of CTA-1 is geographically (coordinate) defined, and is aligned in part along the LTMA-1/LTMA-2 boundary. This has been designed to simplify the overall CTA configuration and impose the least practical impact on Laindon and Thurrock aerodromes and other aerodromes and aircraft operations in the gap between the LSA and LCY CTRs whilst providing containment of a reasonable and pragmatic proportion of the formal IFP containment areas. A number of CTA boundary configurations were evaluated in reaching the final proposed configuration depicted at **Appendix F**.

8.3.4. The purpose of CTA-1 is to provide 500ft vertical containment of those portions of the proposed revised IAPs PANS-OPS Primary Areas for those segments of the procedure at

2000ft ALT and above. CTA-1 also provides containment of departing aircraft flight profiles (and future SID procedures) until attainment of 3000ft ALT is assured. It also provides for radar vectored flight paths to both runways 06 and 24 and the necessary descent profiles to ensure vertical separation from LCY departing flight profiles.

8.3.5. At the northern extremity of CTA-1 the boundary is 'cut back' along the geographic alignment of the north bank of the River Blackwater Estuary. This particular portion of CTA-1 is necessary to contain the flight profile of departing traffic climbing towards CLN.

8.3.6. At the southern extremity of CTA-1 the boundary is 'cut back' (as proposed in the Sponsor Consultation) to minimise impact on aircraft operations over the River Medway Estuary, whilst still providing adequate controlled airspace for containment of IFR flights being radar vectored towards runway 06 final approach from the south and south-east.

8.3.7. It must be noted that in each case the extremities of CTA-1 along the final approach tracks do not fully contain the Primary Areas of the full array of IAPs. The extent of the containment deficiency is depicted in the appendices to the Post-Sponsor Consultation Review documents. A Safety Argument to support the proposed configuration in each case is given in **Section 12** of this ACP.

8.4. Control Area -2 (CTA-2): 2500ft amsl to 3500ft amsl

8.4.1. CTA-2; 1500ft – 2500ft amsl, comprises two discrete portions of CTA adjoining CTA-1 to the north-west and to the north/north-east but which are joined as a single CTA entity.

8.4.2. To the north-west, CTA-2 is a geographically defined box of airspace adjoining CTA-1 which provides, in the main, containment of departing aircraft flight profiles at 3000ft ALT until such time as there is a reasonable assurance that they will have been given climb clearance and achieved 4000ft ALT. It contains the initial flight paths of current PDRs towards EVNAS and the initial portion of future SID procedures via EVNAS, together, in each case, a reasonable provision for tactical radar direction of departing aircraft for traffic integration purposes.

8.4.3. The north-western portion of CTA-2 comprises the residual portion of the previous CTA-3 (Hanningfield Box) detailed in the Sponsor Consultation, which met with strong opposition from the GA and S&R aviation community. The Post-Sponsor Consultation Review of this portion of the airspace, leading to the substantially reduced airspace volume proposed in this ACP, is detailed in the Post-Sponsor Consultation Review Document [CL-8435-DOC-130] submitted separately.

8.4.4. The dimensions of the north-western portion of CTA-2 do not meet the regulatory requirements detailed in CAP725 or CAP778 or the CAA Policy Statement issued on 31 January 2014 for lateral and vertical controlled airspace containment to the SID end point. (In this case controlled airspace containment terminates before EVNAS; the full PDR/provisional future SID procedures extend to LAM and BPK.) However, LSA believes

that an adequate precedent and Safety Argument detailed at **Section 12** (Safety Management) of this ACP provides a pragmatic and acceptable solution to the competing requirements for use of the airspace by the GA and S&R aviation community and by CAT operators.

8.4.5. To the north-east, a 2NM wide 'collar' of CTA-2 around the northern and north-eastern extremity of CTA-1 has been developed, principally as a consequence of LSA participation in the NATS LAMP real-time airspace simulations. It provides controlled airspace to facilitate an adequate descent profile for LSA inbound traffic from the offshore holding area and to meet the NATS requirements for the descent of LSA traffic against other LTMA traffic. It also provides, in the north a 1NM wide collar of CTA for climbing aircraft where they may not have achieved 4000ft.

8.4.6. Whilst the airspace configuration submitted to Sponsor Consultation did not include a 2500ft-based CTA segment in this area, the newly developed airspace requirement is, in the main, over water and reflects achieved aircraft performance and the evolving NATS LAMP LTMA operation. For the small portion of the newly developed CTA which lies overland (above the Bradwell RA and a 1NM strip along the north bank of the River Blackwater Estuary) the environmental impact would be minimal, whilst the airspace configuration is of benefit to airspace users.

8.5. Control Area -3 (CTA-3): 2500ft amsl to 3500ft amsl

8.5.1. CTA-3, 2500ft to 3500ft amsl, comprises a geographically defined box of CTA adjoining CTA-1 to the south of LSA and extending across the Medway Estuary. It lies beneath LTMA-2 (base level 3500ft amsl). The southern boundary of CTA-3 is aligned on the easternmost extremity of LTMA-2. The eastern extremity of CTA-3 is coincident with the eastern boundary of LTMA-2.

8.5.2. The purpose of CTA-3 is two-fold:

- To contain departing traffic from both runways 06 and 24 into the sector DET eastwards towards Thames Gate at 3000ft ALT until it can be given tactical climb clearance by LTC Thames Radar into the LTMA;
- To contain arriving traffic from the same sector once it is beneath London City arriving and departing traffic and is routing towards approach to both runways 06 and 24.

8.5.3. Other LTMA activities affecting the operation of LSA inbound and outbound flights in this area include:

- Heathrow and Gatwick outbound traffic via DET – no procedural or performance assurance of being above 6000ft ALT at DET;
- London/City inbound traffic from the south, nominally via ALKIN but tactically vectored, descending to 4000ft ALT;

- London/City inbound traffic from CLN and BRAIN via SPEAR, which passes over and to the south of LSA descending to 4000ft ALT (normally descending through 5000ft ALT in proximity to LSA);
- London City outbound traffic via Thames Gate, initially limited to 3000ft ALT, climbing when east of London City and crossing the Isle of Grain eastwards between 4000ft and 6000ft ALT;
- Future 'Point Merge' arrival flight paths to London City Airport descending to 4000ft ALT at the Merge Point.

8.5.4. The southerly boundary of CTA-3 is determined by the earliest point at which there is an assurance that a departing LSA aircraft (from either runway 24 or 06) can be given climb clearance above 3000ft ALT and have achieved 4000ft ALT.

8.5.5. Discussions with NATS following the LSA Sponsor Consultation, and including the results of LAMP simulation, have not revealed any new factors in either the pre- or the post-LAMP Phase 1 airspace configuration which would allow a northwards move of the CTA-3 southern boundary within this ACP.

8.5.6. However, LSA undertakes to review this airspace following an acceptable period of operation in the Post-LAMP airspace environment to examine whether the full extent of CTA-3 airspace is still required for the protection of CAT operations.

8.6. Control Area -4 (CTA-4): 3500ft amsl to 4500ft amsl

8.6.1. CTA-4, 3500ft to 4500ft amsl, is an approximately rectangular portion of airspace which overlies a portion of the CTR and parts of CTA-1, CTA-2 and CTA-6. Its boundaries are coincident with the boundaries of the overlying LTMA-7; the northern boundary being coincident with the northern boundary of the underlying LSA controlled CTA airspace segments and CTA-6 above.

8.6.2. The purpose of CTA-4 is solely to provide contiguous controlled airspace between the LSA CTR/CTA-1/CTA-2 segments having a uniform upper limit (for simplicity) of 3500ft amsl and the overlying LTMA in order to provide 'joined-up' controlled airspace to contain climbing and descending flight profiles of aircraft inbound to and outbound from LSA.

8.7. Control Area -5 (CTA-5): 3500ft amsl to 5500ft amsl

8.7.1. CTA-5 is a rectangular CTA from 3500ft to 5500ft amsl which lies to the east of LSA-3 and beneath LTMA-25 (base level 5500ft amsl). CTA-5 lies partly above the Isle of Sheppey and partly above the River Thames Estuary.

8.7.2. The principle function of CTA-5 is to facilitate:

- Tactical radar-directed routing of runway 24 departures to the east of the Thames Gate area in the area shared with London City outbound traffic flows, where there is

an assurance that the departing traffic will be at or above 4000ft ALT but no assurance that it will be above 6000ft ALT;

- Tactical radar directed routing of runway 06 departures, both when the D138 DA complex is active (traffic routed initially towards Thames Gate) and when not active (traffic routed through the DA airspace directly towards LYD/DVR);
- In the post-LAMP airspace configuration[16], tactical routing of arrivals to runway 06 which have been released early to LSA approach within the London City Point Merge airspace;
- In the Post-LAMP airspace configuration, tactical direct routing of arrivals to runway 24 when D138 DA complex is not active (i.e. directly from the Standard Arrival Route towards final approach, bypassing TRIPO).

8.7.3. In the Post-Sponsor Consultation Review, taking due regard of the concerns of both Manston Airport and the airspace users who utilise the airspace above the Isle of Sheppey, together with the more advanced status of the NATS LAMP airspace configuration, LSA was able to 'roll back' the eastern boundary of CTA-5. The resultant CTA-5 volume is approximately 50% smaller than that proposed at the Sponsor Consultation (then designated CTA-7).

8.8. Control Area -6 (CTA-6): 3500ft amsl to 5500ft amsl

8.8.1. CTA-6, 3500ft to 5500ft amsl, is an irregular shaped coordinate defined CTA defining the eastern extremity of the proposed LSA controlled airspace and which lies beneath LTMA-8 (base level 5500ft amsl) and, in part, above portions of the CTR, CTA-1, and CTA-2 (all upper limits 3500ft amsl) to provide continuity to the overlying LTMA. The outer boundary of CTA-6 is aligned around the PANS-OPS holding area for RNAV Holding Area detailed below and is defined by a series of geographical coordinates.

8.8.2. CTA-6 contains a new offshore terminal arrival fix and holding pattern 'GUNFY'[17] *(provisional working designator 5-letter Name Code)*. CTA-6 provides two discrete terminal holding levels for LSA arriving traffic below the LTMA route structure. Should LSA require additional holding, then NATS LTC have confirmed that holding at 6000ft would be permitted by coordination.

8.8.3. At the earliest stages of the airspace development, LSA determined that a discrete holding area was necessary for LSA traffic and that it should be located to the north-east of LSA, preferably offshore. This determination was based on the proliferation of routes and general congestion in the LTMA in proximity to LSA, including the SPEAR holding pattern used regularly and primarily for LCY holding traffic. It was considered that an offshore hold would be less environmentally sensitive to communities on the ground.

[16] Note: In the LAMP 1a airspace configuration, LSA Standard Arrival Routes will be configured further to the east than the current operation with procedural routing to the east of D138 complex to the TRIPO terminal holding pattern to enable strategic integration with the London City Point Merge Approach airspace.
[17] See paragraph 8.8.9.

8.8.4. Furthermore, once the early development of the NATS LAMP project was announced, it was clear that the introduction of the 'Point Merge' concept for LCY arrivals would result in a commensurate easterly move of LSA arrival routes from the south, to the extent that the formal arrival route structure (including STARs) to LSA would most likely need to be aligned to the east of the Shoeburyness DA Complex.

8.8.5. Notwithstanding that the NATS LAMP changes in the eastern part of the LTMA would result in reducing utilisation of the SPEAR hold, nonetheless, utilising SPEAR for LSA arrivals instead would not provide relief for communities and would impact adversely on the climb profile of LCY traffic routing towards CLN, resulting in a consequent impact on the ability to climb LSA departing traffic towards EVNAS and CLN.

8.8.6. Whilst the protection areas of the PANS-OPS holding area for the 'GUNFY' hold lies over land, encompassing Clacton-on-Sea, the nominal holding flight path itself is wholly over water.

8.8.7. As well as containing the holding area, the north western part of the CTA-6 airspace provides containment for LSA departing traffic climbing towards CLN and by-passing the holding pattern and climbing through the holding levels under radar monitoring and direction as necessary.

8.8.8. Additionally, CTA-6 also contains the start of the Initial Approach routing from the 'GUNFY' hold towards both runways 24 and 06. Initially radar vectoring would be the principle operating methodology but it is anticipated that RNAV Initial Approach Procedures (or Transitions to ILS) would be introduced co-incident with the implementation of LAMP Phase 1a.

8.8.9. Originally, at the Sponsor Consultation stage, it was anticipated that the new Terminal Arrival/Holding Fix would be at the existing ATS Significant Point TRIPO. However, in the light of LSA participation in the NATS LAMP Real-Time Simulations it has been determined that in order to provide sufficient descent distance to runway 24 and to enable a more effective integration of arriving and departing traffic the Terminal Fix/Hold should be moved approximately 1NM to the east of TRIPO. It has been possible to achieve this without any increase in the airspace dimensions submitted to Sponsor Consultation.

8.8.10. Whilst the 'GUNFY' holding pattern and associated airspace containment form an essential part of this ACP, the detailed design and formal application for the establishment of the holding pattern will be submitted separately in accordance with the provisions of CA785. However, the design brief and working drawing of the holding pattern is given at **Appendix H**. LSA has undertaken to develop and introduce Sector 3 Entry Fixes as part of the holding pattern development for this ACP to ease the development of STAR tracks through the LTMA by NATS.

8.8.11. It is to be noted that a portion of the GUNFY holding area, but not the holding nominal flight path, overlie Danger Areas D138A and D138B to the south. LSA considers that

adequate mitigation of risk is available and this is detailed at **Section 12** (Safety Management) of this ACP.

8.8.12. It is proposed that, whilst CTA-6 and the GUNFY holding pattern should be introduced as part of this ACP as a single ACP for the LSA airspace development, it should be noted that the formal STARs and use of GUNFY as the Terminal Arrival Fix / Holding Pattern will not be published until the implementation of NATS LAMP Phase 1a changes in the eastern part of the LTMA. At the submission of this ACP the LAMP Phase 1a airspace arrangements are not sufficiently mature to publish the formal STAR procedures for LSA traffic ahead of the implementation of LAMP Phase 1a.

8.8.13. However, publication of the holding pattern at Stage 1 of the LSA ACP will enable tactical use of the holding pattern by LSA arrivals from the east during Stage 1 of the LSA airspace development, prior to the implementation of LAMP Phase 1a, should LTMA congestion in the vicinity of SPEAR make it necessary. This is detailed in **Section 9** below of the ACP.

8.9. Control Area -7 (CTA-7): 3500ft to FL85.

8.9.1. CTA-7, 3500ft amsl to FL85, is a fillet of CTA lying beneath the Clacton CTA (base level FL85) and lies between CTA-5 to the south and CTA-6 to the north and adjoins CTA-1 to the north-west. (Note: At the Sponsor Consultation stage, CTA-7 was at that time designated CTA-8.)

8.9.2. The purpose of CTA-7 is to provide a continuum of controlled airspace beneath the Clacton CTA to facilitate direct routing of arriving flights to both runways 24 and 06 from the east when the Shoeburyness DA complex is not active and the interaction with inbound LCY traffic allows.

8.9.3. It also facilitates controlled airspace containment for southbound departing traffic through the DA airspace when D138 is not active.

8.9.4. Discussions with NATS LTC and the LAMP development team have tested various iterations of this airspace segment and the resulting configuration will be compatible with both the pre- and post-LAMP Phase 1a airspace arrangements.

8.9.5. Furthermore, the eastern boundary of CTA-7 does not infringe the Manston GOPAN hold up to FL85 or the direct track from GOPAN to the RNAV IAP Initial Approach Fix at LUTOL.

8.9.6. Whilst Manston Airport and a number of airspace users objected to the eastern boundary configuration of CTA-7 in combination with CTA-5 to the south, (then designated CTA-8 and CTA-7 respectively at Sponsor Consultation) the 'further roll-back' of the eastern boundary of both segments detailed in the Post Sponsor Consultation Reviews [CL-8435-DOC-127] has enabled Manston Airport to withdraw their objection.

8.9.7. The revised eastern boundary is aligned on the provisional Primary Area containment for RNAV SID procedures according to the present development status of the post-LAMP airspace configuration as it stands at submission of this ACP.

8.9.8. It should be noted that whilst the upper limit of CTA-7 is specified as FL85 in order to facilitate the routing requirements detailed above, on the implementation of the NATS LAMP Phase 1a airspace arrangements it would become part of the NATS airspace containing the LCY Point Merge arrival procedures. Thus it would be re-designated (subject to a successful NATS–sponsored ACP) as part of the Clacton CTA above 5500ft amsl under the jurisdiction of NATS LTC. Consequently, for Stage 2 of the LSA airspace development, Southend CTA segments -5, -6 and -7 could all be joined to form a single Southend CTA-5 entity with base level 3500ft and upper limit 5500ft amsl.

8.10. Stoke LFZ

8.10.1. Stoke microlight airstrip is an active flying site located on the Isle of Grain some 7NM south of LSA and 4.5NM abeam the runway 06 Final Approach track, i.e. on the base leg for IFR arriving traffic to LSA from the south and south-east.

8.10.2. As well as a number of locally based microlight aircraft and a flying school the aerodrome also houses a microlight manufacturing company.

8.10.3. Under the current airspace arrangements aircraft operating from Stoke aerodrome can do so, under IFR or VFR, up to 3500ft amsl without reference to LSA or any other ATS agency. The areas over and in proximity to Stoke aerodrome are routinely overflown by IFR Cat flights inbound to LSA.

8.10.4. Under the proposed controlled airspace configuration detailed in this ACP Stoke aerodrome would lie just outside the ‘rolled back’ southern boundary of the Southend CTA and beneath CTA-1. (The ‘rolled back’ southern CTR boundary is designed to facilitate access to/from Stoke to the west by means of a clearly defined visual reference (railway line). Thus Stoke aerodrome operations would be confined to an upper limit of 1500ft amsl unless in receipt of an ATC clearance.

8.10.5. However, the proximity of the Southend CTR immediately to the north of Stoke aerodrome would deprive Stoke operators of one of their normal operating areas. Therefore LSA proposes to establish, by means of a LoA, a delegated portion of the Southend CTR within which Stoke could operate under VFR up to 1500ft ALT without reference to Southend ATC, subject to notification and operating conditions specified in the LoA.

8.10.6. Airspace delegation arrangements for the use of the Stoke LFZ will be detailed in a LoA that would be subject to CAA approval. Essential information concerning the LFZ would be included in the Southend AIP entry, similar to the arrangement at Cardiff with the St Athan LFZ. The effects of the LFZ on itinerant VFR traffic would need to be considered and a regulatory view given by the CAA.

8.10.7. When the Stoke LFZ is active, LSA ATC would avoid overflight of the LFZ by IFR flights below 2000ft ALT within 2NM of its lateral boundary. VFR flights could transit through the LFZ, subject to generic traffic information, as the current Class G airspace arrangements permit. Conversely, when the Stoke LFZ is not active then LSA ATC would make use of the airspace as normal CTR.

8.10.8. At the Post-Sponsor Consultation Review stage LSA considered in depth the possibility of further adjusting the boundary of the Southend CTR to remove the proposed Stoke LFZ from the CTR and retaining it in Class G airspace beneath CTA-1. However, on balance, it was felt that the benefits of availability of the airspace to LSA ATC for most of the time as CTR outweighed the reconfiguration of the CTR boundary on a permanent basis.

8.10.9. It is emphasised that access to the Southend CTR and CTA is not denied to Stoke microlight operations and will be granted to the maximum extent practicable subject to ATC clearance, particularly for manufacturing test flights as identified by the Stoke aerodrome operator.

8.10.10. A Draft LoA for the Stoke LFZ is currently under development and will be submitted separately as **Appendix B.5.1**.

8.11. Visual Reference Points

8.11.1. Five Visual Reference Points (VRPs) for LSA operations are currently published at UK AIP AD2.EGMC-13, Section EGMC AD2.22,paragraph 6 as follows:

- Sheerness
- St Mary's Marsh
- Maldon
- South Woodham Ferrers
- Billericay

8.11.2. This array of VRPs has worked well for many years. However, it is possible that additional VRPs may be required to achieve the best possible integration of VFR traffic. This is currently under evaluation and the details of any additional VRPs will be submitted separately at a later stage. The suitability of the VRP array will be kept under review in the light of operational experience of the controlled airspace arrangements.

9. Operation of the airspace

9.1. Overview

9.1.1. As noted in paragraph 7.6 above, at an early stage in the development of this ACP it was found necessary to adopt a phased approach for the operation of the proposed Southend CTR/CTA controlled airspace to balance the requirement for controlled airspace against the future introduction of the NATS LAMP airspace arrangements in the LTMA. On the one hand the LSA requirement is urgent but on the other hand both the timetable and definitive LTMA arrangements and procedures for LAMP Phase 1a remain under development, albeit there may be less than one year between the two events. The decision to adopt a phased approach was discussed at length with the CAA.

9.1.2. Thus, for stage 1 of the implementation of this ACP the Southend CTR and CTA controlled airspace will be introduced to provide the necessary protection for CAT IFR flights at the critical stages of flight but the current PDRs, Thames Gate and published Arrival procedures, and the ATC interfaces with LTC, will remain unchanged apart from level capping at 3000ft ALT to provide standard vertical separation from other routes in the LTMA above (see paragraph 9.6 below). For Stage 2 of the operation of the airspace the formal SID and STAR procedures suited to the eventual LAMP airspace requirements will be introduced, including, if necessary, a second ACP and consultation if the LAMP requires alteration of existing nominal departure tracks.

9.1.3. It should be noted that the retention of the existing PDRs for Stage 1 provides a pragmatic solution to the potential double consultation that would otherwise be required for the introduction of formal SID procedures to reflect the Stage 1 operation and then for the as yet unknown changes to departure routes that may arise a short time later from the maturation of the LAMP Phase 1a airspace requirements. This approach also alleviates the considerable procedure design and regulatory costs for introducing SID procedures at the outset, only to redesign them a few months later for the LAMP Phase 1a airspace arrangements. This aspect of the proposal was discussed at length with the CAA before adoption and was accepted as being the most appropriate solution.

9.1.4. The currently notified STARs for LSA are those detailed for LCY arrivals via SPEAR and ALKIN. Likewise, the detailed airspace requirements for the design and implementation of revised STARs to LSA remain immature and could not be introduced before the implementation of LAMP Phase 1a.

9.1.5. Similarly, it would have been a costly and nugatory exercise to develop, consult on and implement a controlled airspace configuration suited to the existing LTMA arrangements and ATC interfaces only to have to carry out a second ACP development and Sponsor Consultation to match the LAMP airspace requirements and procedures, as they reach maturity, for implementation only a few months after the first ACP implementation. This approach, coupled with the various separate Sponsor Consultations required for the LAMP

project itself would have led to significant 'consultation overload', both for the aviation industry itself and for communities affected.

9.2. Resources

9.2.1. LSA currently has operational staffing resources comprising 16 Air Traffic Control Officers (ATCOs) of whom 13 are fully radar qualified. A further 2 ATCOs are being recruited to bring ATCO numbers to 18. Supporting Air Traffic Control Assistant staffing will be increased from 2 to 3. This will provide sufficient resourcing to ensure dual staffing of Radar Control positions from 0930 to 1930 - the peak GA activity period – together with anticipated CAT growth. This is considered adequate to handle the potential increase in VFR traffic volume seeking access CTR/CTA and the associated increased RTF workload.

9.2.2. It is anticipated that the increased staffing and revised distribution of ATS tasks will alleviate the RTF congestion perceived by some airspace users in response to the Sponsor Consultation.

9.2.3. Staffing levels are kept under continuous review as specified in CAP670.

9.3. Pre-LAMP Phase 1a

9.3.1. As noted previously, on implementation of the Southend CTR/CTA as detailed in this ACP, revised IAPs incorporating a glide-path intercept altitude of 2000ft ALT will be introduced but published departure, arrival and holding procedures will be unchanged.

9.3.2. However, it is intended that the offshore holding pattern GUNFY will be also be introduced as a 'stand-alone' entity available for tactical use as required for traffic arriving from the east and to ensure that a fully contained controlled airspace environment will exist for inbound traffic from JACKO and outbound traffic via CLN.

9.3.3. Interface arrangements with the LTC sectors will remain unchanged, including the Thames Gate arrangements for southbound IFR departures and tactical co-ordination and routing of departing traffic via EVNAS and CLN.

9.3.4. LSA intends to remain proactive in the integration of VFR and IFR GA and S&R aviation activity within the CTR/CTA and retain its good working relationship with the GA and S&R airspace user community. It is anticipated that refusal of clearance will be the exception and all refusals will be recorded. In poor weather conditions Special VFR clearance in the Southend CTR will be available on request in accordance with standard UK practice. An array of VRPs already exists to assist the integration of VFR traffic with IAP and other IFR flight paths. VRP locations will be reviewed in the light of operational experience of the controlled airspace arrangements. It is not anticipated that designated VFR routes or notified Entry/Exit Lanes will be required as it is considered that a more tactical approach to integrating CTR access is preferable, particularly with the additional particular constraint of the nearby D138 complex.

9.3.5. It is anticipated that overflying traffic which currently utilises the LARS service will request, and will be granted, VFR or IFR transit clearance through the CTR/CTA along much the same routes as are currently used with tactical radar intervention for traffic integration as necessary.

9.3.6. Since December 2013, ahead of the implementation of this ACP, LSA has been carrying out an Operational Trial enabling distribution of tasks between two Radar Control positions, utilising one position to provide the general APPROACH/RADAR function and the other providing a DIRECTOR role for arriving CAT and other IFR flights. The Trial is already leading to increased capacity as RT Frequency loading is reduced commensurately when two frequencies are utilised.

9.3.7. Whilst the TMA route structure and Inter-Unit ATM arrangements will remain as currently published it is anticipated that the existence of a wholly controlled airspace environment for LSA CAT arriving and departing flights will ensure more efficient handling of traffic and more efficient achieved flight profiles.

9.4. Post LAMP-Phase 1a

9.4.1. At the introduction of NATS LAMP Phase 1a arrangements in the eastern part of the LTMA, currently expected to take place in late 2015, formal SID procedures will be designed and introduced in accordance with the requirements of CAP778 and the subsequent Policy Statements of 16 and 17 January 2014. Should the definitive routing requirements of the LAMP project require changes to the nominal ground track of the SID procedures then this will be the subject of a further ACP and Sponsor Consultation and will be discussed with the CAA at a later stage. Noise abatement procedures for LSA will not change as a consequence of SID procedures.

9.4.2. Following LSA suggestions to the NATS LAMP Development Team and LTC operations staff, it is anticipated NATS will introduce trans-TMA Link Routes in order to reduce both the number of SID procedures required and the route length of the SID procedures. Thus, for example, instead of requiring discrete SIDs to DVR, LYD and SAM to the south from each runway as is the case with the current PDRs, only a single SID would be required from each runway to a common waypoint from which trans-TMA routes would provide linkage to the en route ATS route System.

9.4.3. At the introduction of NATS LAMP Phase 1a airspace configuration formal discrete STARs will be introduced to the GUNFY holding pattern from both the northerly LTC sectors and the southerly sectors. Whilst under the LAMP division of workload arrangements agreed between NATS and the CAA, it will be the responsibility of NATS to design and notify the LSA STARs, nonetheless LSA will continue to work closely with NATS in developing the STARs and associated ATM arrangements.

9.4.4. In developing the route structure and ATM operating arrangements for the LAMP Phase 1a airspace configuration LSA will take steps to ensure equitable LTMA access and efficient trans-TMA routings for LSA CAT flights.

9.4.5. At a very early stage of this project discussions took place with the easyJet Base Captain and Performance Specialist to determine whether an RNP SID procedure could be developed from runway 06 to the south which would remain clear of the D136/138 DA airspace. The discussions demonstrated that, with suitable use of RF legs and speed limits, an RNP procedure could be developed well within the performance of the A319. However, discussions with CAA DAP staff indicated that the promulgation of such a procedure would not be permitted in advance of the CAA studies into the application of RF leg coding in the UK environment. Thus, at least for the initial stages of the post-LAMP airspace arrangements, any southbound SID from runway 06 will remain as an RNAV-1 procedure which will transit through the DA airspace and be available for use only when the DA complex is inactive. When the DA complex is active, departures from runway 06 will continue to rely on radar vectoring to remain clear of the DA complex.

9.5. Navigation Infrastructure

9.5.1. LSA intends to retain its present array of conventional IAPs for the foreseeable future, which requires the retention of the SND NDB. RNAV IAPs will be introduced in 2014 and it is anticipated that these will gradually reduce the requirement for DME arc Direct Approaches.

9.5.2. Future SID and STAR and Transition to ILS procedures will be RNAV procedures with a navigation standard of RNAV 1.

9.5.3. At the outset of this project LSA commissioned a DME coverage study using the EUROCONTROL DEMETER analysis tool which demonstrated potentially less than adequate DME coverage at the required 500ft aal to allow the use of DME/DME RNAV by airspace users for departures. However, coverage improved rapidly above this and at 600ft amsl (545ft aal) entirely adequate coverage with 'Excessive Redundancy' predicted within 3NM of LSA at this altitude / height can be demonstrated. The DME Coverage Report is submitted separately [CL-4835-RPT-014].

9.5.4. The DEMETER analysis results closely replicated the results obtained from a Flight Inspection of DME coverage as the Flight Inspection showed that there was limited coverage to the South-West at the required 500ft aal. However, given the DME-rich environment existing in the south-east of England it is anticipated that the DEMETER results are valid above this altitude and that DME/DME RNAV operations are feasible. A Safety Argument to cover the minimal shortfall in coverage at 500ft aal is at paragraph 12.7.

9.5.4. At the outset of this project LSA undertook a survey of aircraft RNAV equipage of the principle CAT operators using the airport. All operators surveyed were RNAV1 equipped

and approved by their State of Registry or expected to be equipped and approved by the end of 2013. All were, or would be, equipped with RNP-capable systems.

9.6. Departure Integration with LCY traffic

9.6.1. Extensive discussions have taken place between LSA and LTC to determine departure routes and procedures for LSA traffic to facilitate the most effective integration of LSA departing traffic into the overlying LTMA.

9.6.2. In terms of routing, it has been established that for departures to the northwest a published routing via EVNAS and tactical routing as necessary remains the only feasible option in the short and medium term.

9.6.3. For traffic to the south, for pre-LAMP Phase 1a the currently agreed tactical routing procedures via Thames Gate would remain the most effective operation. For the LAMP-Phase 1a LTMA arrangements to the south of LSA, NATS is developing cross-TMA link routes (Airways) to provide linkage for both LSA and LCY SID procedures to replace the tactical Thames Gate procedures and to enable the development of formal SID procedures from LSA. Whilst development of the proposed LTMA routes configuration is well advanced (provisional 5LNC 'ENIRI') it is not yet mature enough to commit the design and development of SID procedures with this ACP.

9.6.4. However, the vertical integration of routes and procedures has proven a particularly complex issue. Whilst the LSA objective has been to establish an upper limit to LSA departure procedures within the LTMA levels so that departing aircraft are not held down at low altitudes for long distances it has not been able to achieve this through strategic procedure design.

9.6.5. LCY's SIDs are currently initially 'capped' at 3000ft ALT until 2-way RTF contact has been established with the appropriate LTC Sector Controller, who is responsible for approving further climb clearance above the 3000ft ALT SID limit. Furthermore, safety management 'Best Practise' now requires a minimum of 2000ft vertical spacing to be built into crossing/converging and climbing/descending procedures or routes. These constraints impact upon LSA's operation and have influenced the design of the CAS proposal.

9.6.6. In association with the 3000ft upper limit for LCY SID procedures there is an obligation on LTC sector controllers to issue climb clearance to LCY departing aircraft to ensure that they are 4000ft or above by the LTMA-1 boundary (BEMID/GINTY) for controlled airspace containment. Thus LCY departing aircraft would be above 4000ft climbing when entering the area of lateral conflict with LSA Noise Abatement and departure routes. In general it can be expected that LCY departing aircraft will be at 5000ft or above when converging with LSA departure routes to EVNAS or Thames Gate or ENIRI. Therefore, in order to preserve NATS 2000ft vertical spacing requirement, LSA departure procedures must be initially capped at 3000ft ALT until the departing aircraft is in direct communication with a Radar Controller (LSA or LTC). It is anticipated that the ATC interface arrangements under

development will enable direct climb to 4000ft as soon as contact with a Radar Controller is established, but it cannot be written into the published procedures.

9.6.7. Furthermore, due to the capping of LCY procedures at 3000ft, pre-departure release co-ordination of traffic will remain a NATS requirement, although it is expected that the improved airspace arrangements will reduce release delays.

9.7. Arrivals integration with LCY traffic

9.7.1. Due to potential conflict between LCY departing traffic, level capped by procedure at 3000ft ALT, routing towards BEMID/GINTY/CLN (or, post-LAMP Phase 1a, towards RHINO/CLN) and not yet given climb clearance or having achieved 4000ft ALT and traffic inbound to LSA runway 06 on the downwind left hand leg - effectively head-on to one another – it will be necessary to develop Unit interface arrangements that ensure vertical separation between aircraft at all times.

9.7.2. Discussions on the separation assurance arrangements are on-going between LSA and LTC and various options have been considered. However, the preferred solution would be the use of Buffer Zones between the LTC and LSA areas of operation by which point LSA traffic must be vertically separated below altitudes in use by LTC. Buffer Zones arrangements were used successfully during the period of the Olympics Temporary Controlled Airspace in 2012. The outcome of discussions and the proposed separation assurance arrangements will be notified to CAA, supplementary to this ACP, in due course.

10. Impact on airspace users groups

10.1. General

10.1.1. Throughout the development of this ACP the primary objective has been to establish a safe, controlled and managed airspace environment to provide for the continued safe operation of the increasing numbers of passenger carrying CAT flights inbound to and outbound from LSA at the critical stages of their flight below the LTMA whilst, at the same time taking due regard of the competing requirements of all other classes of airspace user and the environmental and economic impact of aircraft operations.

10.1.2. The competing demands on the use of the airspace outlined above are often incompatible with one another and thus a balance has to be struck. It is inevitable that in some areas some elements of the aviation community may be disadvantaged whilst other areas benefit.

10.1.3. A further demand placed upon the airspace development has been to ensure compatibility and efficient interface with the overlying LTC Sectors in both the pre- and post-LAMP arrangements and to ensure equitable access arrangements for LSA traffic.

10.1.4. However, at all times, safety and the protection of the fare-paying public remains paramount.

10.2. Commercial Air Transport Operators

10.2.1. CAT flights operating to and from LSA will benefit from being protected within controlled and managed airspace environment throughout their flights.

10.2.2. The distraction and requirement to react to frequent ATC intervention, either through radar vectoring or excessive traffic information, against high densities of airspace usage by manoeuvring and transiting ‘unknown’ traffic will be eliminated at a time of the flight when configuration changes and checklists are being addressed by the flight crew.

10.2.3. Direct climb to or descent from higher levels within the LTMA cannot be built into procedures from the outset due to the proliferation of routes and traffic at the lower levels of the LTMA and the Safety Management requirements for the separation and spacing of intersecting routes. Nonetheless, the elimination of unknown traffic and the ability to establish more effective traffic planning and co-ordination will lead to significantly improved flight profiles.,

10.2.4. Whilst it is accepted that for departing traffic ‘free-flow’ ATC interface procedures may not be feasible due to the interaction of routes with other low level routes and traffic in the LTMA, nonetheless it is anticipated that the elimination of unknown traffic will enable more effective co-ordination of departing traffic to higher levels immediately after departure.

10.2.5. One of the requirements of the LSA ACP is that NATS should afford more equitable access to the LTMA route structure to LSA arriving and departing CAT flights than is currently given. NATS has given assurance to this effect and the growth of LSA CAT traffic has been incorporated into the LAMP development planning and simulation.

10.3. LSA-based GA and S&R Operators

10.3.1. GA and S&R aviation operators based at LSA are already well used to operating with ATC providing traffic integration and the fact that this will now be taking place within Class D airspace has been welcomed by the majority of operators.

10.3.2. Local VFR training and handling flights can be conducted in discrete 'quiet' portions of the CTR/CTA as necessary with the minimum of restriction necessary for the integration with other flights.

10.3.3. Special VFR clearance will be available within the CTR in poorer weather conditions to allow access to and from the airport and operation within the CTR. The standard conditions for Special VFR clearance as detailed in the UK AIP at ENR 1.2 will apply.

10.3.4. Local IFR training flights will be handled much as they are today with ATC providing standard IFR separation against other IFR traffic. However 'unknown' overflying traffic passing through IFP flight paths and in conflict with IFR training flights will be eliminated in the known traffic environment. Disruption to IFR training flights will therefore be reduced.

10.4. VFR or IFR Transit Flights

10.4.1. A substantial proportion of directly transiting flights in proximity to LSA already participates in the LARS Service and these pilots are well used to traffic integration as necessary by ATC. It is anticipated that these flights will, instead, request VFR or IFR transit through the CTR/CTA and will not be disadvantaged by the establishment of Class D controlled airspace.

10.5. VFR Training Areas

10.5.1. To the west of LSA the originally proposed volume of CTA from 2500ft to 3500ft amsl has been reduced by approximately 50% as a consequence of the Post-Sponsor Consultation Airspace Review [CL-4835-DOC-130]. Thus flying training operations from surface to 3500ft ALT can continue to the west of CTA-2 and up to 2500ft ALT beneath CTA-2.

10.5.2. As detailed in the Post-Sponsor Consultation Review Document [CL-4835-DOC-130] it was not possible to 'roll back' the boundary of CTA-2 further in order to avoid overlying the Hanningfield Reservoir itself. To have done so would have resulted in LSA departing CAT flights leaving controlled airspace before reaching LTMA levels.

10.5.3. The other area routinely used for flying training exercises is the vicinity of Abberton Reservoir to the north. The Abberton Reservoir itself remains beyond the northern

boundary of any of the proposed LSA CTAs and is below the LTMA-8 with base level 5500ft amsl. The northern extremity of CTA-6 lies approximately 1NM south of the Reservoir itself and the northern extremity of CTA-2 lies south of Mersea Island. Thus flying training operations over and to the north and east of Abberton Reservoir are unaffected by this ACP, operations to the south will be affected to some extent although VFR access to the CTA will remain available on request.

10.5.4. Vintage jet aircraft from North Weald sometimes use the Dengie coastline to the northeast of LSA for training, formation and commercial flights. It is acknowledged that these flights may be disadvantaged, both in transit and in operation, if they elect to remain outside controlled airspace. However, should they request clearance within the CTR/CTA airspace then they will be able to continue 'as normal' and will have the added protection of controlled airspace within which to conduct their high energy manoeuvring.

10.6. Specific Nearby Aerodromes

10.6.1. North Weald

10.6.1.1. North Weald aerodrome lies beneath the Stansted CTA (base level 1500ft amsl) some 22NM to the west-north west of LSA. Flying training and other operations by North Weald-based operators takes place, to a large extent, to the east of the aerodrome beneath LTMA-1 (base level 2500ft amsl) and LTMA-3 (base level 3500ft amsl).

10.6.1.2. The airspace configuration affecting these operations will remain unchanged until Southend CTA-2 (base level 2500ft amsl) is reached some 12NM east of North Weald (just to the west of Hanningfield Reservoir). Operations up to 3500ft ALT can still take place north-eastwards in the gap between LSA CTA-2 and LTMA-2 (to the east of London Stansted Airport).

10.6.1.3. Access to the Southend CTR/CTA will be available, as necessary, subject to ATC clearance either to transit through or operate within the CTR/CTA in accordance with the normal rules for Class D airspace.

10.6.1.4. As detailed previously, vintage 'warbird' operations from North Weald periodically transit eastwards to an operating area over the Dengie coastline. Provision will be made within the normal operating rules for Class D airspace for these aircraft to transit through and operate within the Southend CTR/CTA should they wish to do so, with the minimum of hindrance to their operations.

10.6.2. Stapleford

10.6.2.1. Stapleford aerodrome lies beneath LTMA-1 (base level 2500ft amsl) some 20NM to the west of LSA. The principle flying training area for Stapleford-based operators is beneath LTMA-3 (base level 3500ft amsl) over and in the vicinity of Hanningfield Reservoir.

10.6.2.2. It is acknowledged that those operations from Stapleford that do not wish to seek clearance to operate within the new Southend CTA overlying the eastern part of their normal operating area will be disadvantaged in the vertical extent of Class G airspace available to them.

10.6.2.3. The 'roll-back' of the original configuration of the proposed Southend CTA to the west of LSA (in the dimensions of both CTA-1 and CTA-2) has considerably reduced the operational impact of the LSA controlled airspace on Stapleford operations. The airspace volume of the reconfigured CTA segments is approximately 50% smaller than that originally proposed.

10.6.2.4. Furthermore, provision is made within the normal rules for Class D airspace for aircraft operating to/from Stapleford to request clearance to operate within the LSA CTR/CTA should they wish to do so.

10.6.3. Stow Maries

10.6.3.1. Stow Maries lies beneath Southend CTA-1 (base level 1500ft amsl) some 6NM north of LSA. Whilst the Post Sponsor Consultation Review of the airspace configuration was able to reduce the width of CTA-1 to 1.5NM, it was not possible to roll it back further to eliminate the portion over Stow Maries.

10.6.3.2. Current light aircraft operations at Stow Maries are routinely low and weather dependent, outside of air display and 'fly-in' days (see below). However, its growing importance as a publicly funded aviation heritage site is acknowledged and growth of aircraft operations (both visiting aircraft and based aircraft) is anticipated.

10.6.3.3. LSA ATC has already agreed, through a written undertaking, to provide every assistance possible to aircraft accessing Stow Maries aerodrome requiring to transit through the Southend CTR/CTA, in particular to/from the south.

10.6.3.4. For the occasional 'fly-ins' and air displays hosted by Stow Maries, LSA will continue to work with the Stow Maries management to develop efficient access to/from the aerodrome, including delegation of airspace as necessary.

10.6.4. Thurrock and Barnard's Farm (West Horndon)

10.6.4.1. Thurrock and Barnard's Farm aerodromes lie beneath the LTMA-1 (base level 2500ft amsl) some 15NM southwest of LSA and are within 2NM of each other. Thurrock houses a

number of microlight and light single/twin engine aircraft. Many visiting aircraft are associated with the based maintenance organisation. Barnard's Farm is a farm strip with usually no more than two aircraft based and is not intensively used.

10.6.4.2. The Post-Sponsor Consultation review of the proposed LSA airspace configuration, as a consequence of the LSA investment in reconfigured IAPs, was able to 'roll back' the western extremity of the originally proposed CTR to the east of Thurrock aerodrome.

10.6.4.3. Furthermore, careful consideration of the western extremity of Southend CTA-1 has enabled the western boundary of the CTA to lie further away from Thurrock aerodrome so that it would no longer affect the final approach track to runway 25 at Thurrock or runway 24 at Barnard's Farm.

10.6.5. Laindon

10.6.5.1. Laindon aerodrome lies approximately 9.5NM west of LSA and, although not intensively used, houses a number of light and microlight aircraft.

10.6.5.2. The original airspace configuration proposed at Sponsor Consultation placed Laindon beneath CTA-1 with base level 1500ft amsl. The Laindon aerodrome operator was concerned that this would preclude 'overhead joins' by non-radio light aircraft who could not obtain clearance into CTA-1.

10.6.5.3. The Post-Sponsor Consultation Review of the airspace to the southwest of LSA, as a consequence of the LSA investment in reconfigured IAPs, was able to reduce the northern and western boundaries of CTA-1 such that Laindon now lies beneath CTA-2 (base level 2500ft amsl)

10.6.5.4. Furthermore, the significant reduction in the extent of the proposed Southend CTR to the south of Laindon has ameliorated concerns over the 'Choke Point' aspects of the airspace to the maximum extent practicable.

10.6.6. Rochester Airport

10.6.6.1. Rochester Airport is 15NM southwest of LSA and lies beneath LTMA-1 (base level 2500ft amsl). Since the initiation of this ACP, the Rochester Airport management, with the support of the LPA has announced development plans which include the decommissioning of the grass runway 16/34, leaving only parallel runways 02/20 available, one of which will be paved. Additionally it is proposed to introduce RNAV IAPs to runway 20.

10.6.6.2. Concerns of Rochester Airport, the LPA and local operators expressed at the LSA Sponsor Consultation included the possible 'Choke Point' impact from the proximity of the Southend CTR and CTA with base level 1500ft amsl to the north and the proposed CTA with base level 2500ft amsl to the northeast of Rochester.

10.6.6.3. Post-Sponsor Consultation Review of the airspace configuration [CL-4835-DOC-127] has enabled the CTR to be 'rolled back' substantially as a consequence of the LSA investment in reconfigured IAPs. However, it has not been possible to adjust the western boundary of CTA-3, which is aligned with LTMA-1 boundary, or the southern boundary of the proposed CTA-3 segment.

10.6.6.4. However, LSA remains in discussion with the Rochester Airport authorities to develop suitable co-ordination procedures between LSA ATC and Rochester FISOs to accommodate and expedite the passage of Rochester arriving and departing aircraft through the Southend CTA and CTR as necessary.

10.6.6.5. It is probable that the future development of an RNAV IAP to runway 20 at Rochester will penetrate the Southend CTR/CTA and conflict with LSA arrivals to runway 06 from the south and departures from runway 24 to the south. LSA will work closely with the Rochester Airport authorities to facilitate effective integration of the two airports' traffic.

10.6.7. Stoke Aerodrome

10.6.7.1. Stoke microlight aerodrome lies on the Isle of Grain some 7NM south of LSA.

10.6.7.2. The operation of Stoke aerodrome and the proposed LFZ and LoA have been detailed previously in **Section 8** of this ACP.

10.6.8. Earls Colne, Rayne, Andrewsfield

10.6.8.1. Earls Colne, Rayne and Andrewsfield all lie more than 20NM north of LSA and in closer proximity to the Stansted CTA than to the proposed Southend CTA. All house a number of privately owned light aircraft and FTOs operate from Earls Colne and Andrewsfield.

10.6.8.2. Flying Training operations from Earls Colne tends to take place more to the east towards Abberton Reservoir than to the south towards Hanningfield Reservoir, although a proportion of operations take place across the whole of the airspace to the south of the three aerodromes.

10.6.8.3. It is anticipated that the reduced dimensions of the proposed Southend CTR/CTA as a consequence of the Post-Sponsor Consultation Review and the LSA investment in reconfigured IAPs will minimise the impact of the Southend ACP on those operators who do not wish to enter Class D airspace.

10.6.8.4. However, access to the CTR/CTA will be available, subject to ATC clearance in accordance with the normal rules for the operation of Class D airspace.

10.6.9. St Lawrence, Tillingham, Burnham and Barling

10.6.9.1. St Lawrence and Tillingham Aerodromes lie within the Southend CTR to the northeast in close proximity to the runway 24 radar vectored base leg and final approach track and to the runway 06 departure route towards CLN. Aircraft activity at these aerodromes is only very occasional. Burnham aerodrome lies adjacent to the runway 24 final approach track and runway 06 departure track and aircraft activity is minimal. Barling aerodrome lies 3.5NM east of LSA, south of the runway 24 final approach track but on the runway 06 departure path for southbound aircraft.

10.6.9.2. The Post-Sponsor Consultation review of the airspace configuration could not find a way of placing these aerodromes outside the CTR. LSA is in discussion with the aerodrome owners to develop LoAs (similar to those put in place for the Olympics Temporary Controlled Airspace in 2012) which will facilitate simple, but coordinated, access arrangements both for radio and non-radio aircraft to and from these aerodromes. The LoAs have not yet reached maturity and will be submitted to the CAA separately at a later stage.

10.6.10. Canewdon

10.6.10.1. Canewdon is a parascender launching field rather than a formal aerodrome and is only occasionally used.

10.6.10.2. The parascenders operating from Canewdon have only recently contacted LSA ATC to advise of their activity. LSA is content to allow parascending to continue from the site by arrangement and is in contact with the parascending operator to establish operating and co-ordination procedures suitable for Class D airspace.

10.6.11. Others

10.6.11.1. A number of other small aerodromes were identified earlier in this document around the periphery of the proposed CTR/CTA and further away.

10.6.11.2. LSA considers that the substantial reduction in the overall volume and configuration of the proposed controlled airspace as a consequence of the Post-Sponsor Consultation Reviews ameliorates, to the maximum extent practical the concerns of the GA and S&R airspace user community expressed in response to the Sponsor Consultation, particularly for those airspace users cannot or who choose not to utilise controlled airspace.

10.6.11.3. Furthermore, as detailed in **Section 8** of this ACP, access to the CTR/CTA will remain available to airspace users subject to ATC clearance in accordance with the normal rules for Class D airspace.

10.7. Gliding Operations

10.7.1. Sites of relatively intense gliding operations exist both to the north (Wormingford; 22NM north of LSA) and to the south (Challock; 22NM south of LSA).

10.7.2. Cross country flights below the LTMA towards LSA take place periodically from these and other gliding sites. The airspace below the LTMA-3 (base level 3500ft amsl) and LTMA-25 (base level 5500ft amsl) towards the Isle of Sheppey is used in certain weather conditions by gliders from Challock for training and general handling purposes.

10.7.3. Furthermore, in response to the Sponsor Consultation, it was apparent that a moderate number of cross country glider flights aim to cross the River Thames to the southwest of LSA in proximity to the runway 06 arrival and final approach tracks.

10.7.4. Notwithstanding that it was established in Sponsor Consultation that the majority of gliders are radio equipped, gliders operating on cross country flights in proximity to the flight paths of LSA arriving and departing IFR flights seldom, at present, contact LSA ATC. Indeed, the log of ATC events submitted separately [CL-4835-DOC-138] details a number of occasions in which avoiding action and extended routing or ground delay was necessary to avoid unknown radar contacts which may have been glider activity, or were visually observed to be gliders. Had these pilots contacted LSA ATC by RTF when in proximity to LSA then the disruption to CAT flights could have been avoided.

10.7.5. Gliders are not excluded from access to Class D airspace, subject to clearance from ATC. Conversely, it is acknowledged in MATS Part 1[18] that controllers should be cautious in granting access to gliders due to their inability to comply with precise ATC instructions.

10.7.6. Whilst LSA ATC will make every endeavour to grant clearance to gliders to operate within or transit through the Southend CTR/CTA, nonetheless it is inevitable that, to a certain extent, glider operations may be disadvantaged by the establishment of the CTR/CTA. However, LSA believes that, on balance, the need to provide a safe and managed controlled airspace environment for passenger carrying CAT flights on this occasion outweighs the needs of sport and recreational glider operations.

10.8. Military Airspace Users

10.8.1. Military utilisation of the Essex/North Kent airspace below the LTMA is minimal and is, in the main, limited to low level operations by Army Apache Helicopters from Wattisham and Colchester Barracks to and from various operating sites in the Region. Other UK and foreign military helicopters and occasional fixed-wing aircraft transit through the area from time to time.

10.8.2. All military aircraft operating in the area are RTF and transponder equipped and access to the CTR/CTA will be granted in accordance with normal Class D airspace principles.

[18] MATS Part 1, Section 1, Chapter 4

10.8.3. Sponsor Consultation of this ACP was carried out through the MUACT as noted in Part E of the ACP and no operational objections to the development of controlled airspace in the vicinity were expressed.

11. Impact on ATC

11.1. General

11.1.1. For many decades Class D controlled airspace (or its previous equivalent) has been the principle airspace classification and airspace management tool applied in the vicinity of airports throughout the UK. Indeed, it was previously applied in the vicinity of LSA until 1993 and again in 2012 temporarily for the duration of the Olympic Games. Empirical evidence is that it is effective and works well.

11.1.2. Class D controlled airspace allows access to all classes of aircraft activity, both under the VFR and the IFR, and allows controllers to manage the integration of traffic most effectively without the requirement to establish full separation standards between all airspace users; it therefore ensures efficient, safe and effective utilisation of available airspace.

11.1.3. It also enables controllers to manage RTF workload by judicious use of routing or altitude instructions for VFR flights or the sensible allocation of operating areas for manoeuvring operations.

11.1.4. Class D airspace classification is ideally suited to application in the vicinity of LSA because there is a high density of GA and S&R aviation activity competing for use of the airspace with passenger carrying CAT flights at a time of high cockpit workload.

11.1.5. Throughout the development of this ACP the objective has remained to establish a safe and efficient controlled airspace environment which will provide safe, efficient and equitable access to the LTMA route structure for the increasing number of passenger carrying CAT flights whilst sustaining maximum flexibility for access by other airspace user activities.

11.2. Southend ATC

11.2.1. Southend ATC will benefit from being able to provide ATS within a known and managed controlled airspace environment.

11.2.2. Study of the ATC 'Events Log' [CL-4835-DOC-138] clearly demonstrates the intense ATC workload arising from avoiding action and extended routing of aircraft whilst endeavouring to provide the Deconfliction Service in the confined airspace beneath the LTMA or in endeavouring to resolve conflict by co-ordinating higher levels with busy LTC sector controllers. Conflict resolution workload will be eased considerably by effective management of the whole of the airspace usage rather than only a part of it.

11.2.3. Conversely, it was noted in the responses to the Sponsor Consultation that there was concern in the GA and S&R airspace user community that LSA would not be able to handle

the increased RTF loading from increased numbers of GA and S&R flights seeking clearance into the airspace.

11.2.4. LSA believes that the reduction in conflict resolution RTF workload and reduction in controller to controller co-ordination together with the redistribution of controller workload between 2 radar positions that has already been successfully trialled will ensure that there is sufficient controller capacity to handle the demand.

11.2.5. Whilst it is accepted that for departing traffic 'free-flow' ATC interface procedures may not be feasible due to the interaction of routes with other low level routes and traffic in the LTMA, nonetheless it is anticipated that the elimination of unknown traffic will enable more effective co-ordination of departing traffic to higher levels immediately after departure.

11.3. NATS LTC

11.3.1. NATS LTC controllers will benefit in their interface with LSA controllers from operating in a wholly controlled airspace environment.

11.3.2. It is expected that a much more 'stable' routing of departing traffic will result, without the need for LSA controllers to deviate around unknown traffic over and above the tactical routing requirements required by the LTC sector controllers.

11.3.3. Transfer of control of departing aircraft is expected to take place much earlier, resulting in earlier climb clearance into LTMA airspace.

11.3.4. As noted above, 'free-flow' departures from LSA may not be feasible as noted above, nonetheless it is expected that the wholly controlled airspace arrangement beneath the LTMA will enable better integration of the overall LTMA traffic flow at the lower levels and a substantial reduction in the departure delays outlined in the Log kept by LSA [CL-4835-DOC-139].

11.3.5. In the Post-LAMP airspace configuration it is expected that the more efficient handling of LCY and BQH arriving and departing traffic, together with the higher altitudes utilised for LCY/BQH arriving traffic, will lead to a substantial improvement to arriving and departing achieved flight profiles for LSA traffic.

11.4. NATS Farnborough LARS

11.4.1. The proposed Southend CTR/CTA lies outside the published service area of the Farnborough LARS. The existing arrangements detailed in a LoA between NATS Farnborough and Southend ATC will remain suitable for use when the Southend CTR/CTA is introduced. However, the LoA will be reviewed between both parties before the controlled airspace is introduced to ensure it remains fit for purpose.

11.4.2. Farnborough controllers will need to be aware of the Southend CTR/CTA and the need to transfer aircraft to Southend ATC in good time to negotiate entry or crossing clearance as necessary, as well as being aware of the effect that the controlled airspace may have on the routing of individual aircraft.

11.4.3. Direct lines exist between LSA and Farnborough for co-ordination of traffic. No additional resources are required.

12. Safety Management

12.1. Introduction

12.1.1. Safety Management is an intrinsic element of any proposed change to the airspace arrangements. LSA has an obligation to provide an ATS and IFPs which are safe. LSA operates a Safety Management System (SMS) which meets the requirements specified by the CAA in CAP670 "ATS Safety Requirements".

12.1.2. In developing this ACP, including the development of the initial proposed airspace configuration submitted to Sponsor Consultation and in conducting the series of Post-Sponsor Consultation airspace reviews, sound Safety Management principles have been applied throughout, including the consideration of options.

12.1.3. The revised airspace configuration developed from the Post-Sponsor Consultation Review will be subject to a Hazard Identification (HAZID) analysis by a group of representative stakeholders from ATC, aircraft operators and safety specialists prior to the CAA Regulatory Decision on the ACP[19].

12.1.4. In developing the Post-Sponsor Consultation Reviews of the proposed airspace configuration, LSA has taken due regard of recently revised policy guidance from the CAA regarding the more relaxed regulatory approach to containment of the Primary Areas of IFPs. Thus, in certain areas the revised airspace configuration does not meet, in full, the basic regulatory requirement. Derogations are identified in the following paragraphs together with a Safety Argument to justify the derogation. The Post-Sponsor Consultation Review documents are submitted separately [CL-4835-DOC-125 to -131] as detailed at **Appendix B.**

12.2. Control Area Base Levels

12.2.1. The CAA guidance states that, wherever practicable, CTA base levels should be no lower than 1500ft ***agl*** in order to permit VFR flights to operate beneath them in compliance with Rule 5 of the RotAR.

12.2.2. However, in order to facilitate revised IAPs with Intermediate Segment altitude at 2000ft, instead of 1500ft, it would be necessary to use a CTA with base level 1500ft ***amsl*** in order to preserve 500ft vertical containment of IFR flights above the base of controlled airspace.

12.2.3. LSA contends in Part 1 of the post-Sponsor Consultation reviews that the 500ft vertical containment requirement, which is a cornerstone of international ATC practice, should not be reduced whereas the use, in the specific terrain environment of South-East Essex, of 1500ft ***amsl*** as a CTA base level is both safe and enables aircraft operating below the CTA to remain in compliance with Rule 5 of the RotAR over a very large majority of built-up

[19] It is anticipated that HAZID action will be completed before the end of July 2014 and appropriate documentation will be submitted separately.

areas. This provides a pragmatic solution that balances the various conflicting airspace and user demands in the very congested airspace in the south-east of England under the LTMA. Moreover, the alternative – fully compliant – design options result in impractical airspace designs that are unacceptably restrictive to various airspace users in the area.

12.3. Runway 06 IAP Primary Area Containment

12.3.1. It is proposed that for ease of assimilation by GA pilots, the south-western extremity of the 1500 to 3500ft CTA-1 collar around the reduced CTR should extend only as far as the LTMA-1 boundary. Thus, a portion of the Primary Areas for the revised IAPs to runway 06 would lie outside controlled airspace beneath the LTMA-1.

12.3.2. Safety Argument:

- The published IAP Initial and Intermediate segments are seldom used, other than for training flights, during the period 0630 - 2330 - their principle use is between 2330 - 0630 when Approach Radar is not manned;
- The normal ATS operation is primarily by radar vectoring for which the 2NM radar vectoring buffer could be routinely achieved;
- The nominal track of each IAP would remain within the reduced CTA from the Initial Approach Fix to the Final Approach Fix by a buffer considered adequate and appropriate to normal day-to-day IAP navigation, albeit not in all cases to the full 3NM reduced containment normally required by the recently revised CAA Policy Statement;
- The nominal track of the SND NDB/base turn procedures would lie approximately 2NM within the CTA boundary (a "do not exceed I-SO D10" could be added to the IAP Chart as a containment precaution);
- Between 2330 and 0630, when the full IAPs are principally used, the 'threat' from aircraft outside the CTA inadvertently penetrating the CTA when an IAP is in progress is reduced as few GA flights operate then in Class G airspace without contacting an ATS authority;
- LSA has ATM monitoring by the Approach Procedural (APP) controller between 2330 -0630. Therefore, surveillance monitoring is available during this time and, historically, has proven very effective; see Appendix C.2;
- The use of a common boundary for LTMA-1 and Southend CTA provides a simple and easily understood CTA configuration for GA pilots to assimilate and would reduce charting complexity;
- A 'Warning' of the proximity of the controlled airspace boundary could be added to the IAP Charts and the controlled airspace configuration depicted[20].

[20] Whilst the depiction of controlled airspace boundaries on IAP charts is not normal CAA Policy, nonetheless there are a number of exceptions.

12.3.3. Given the strong and largely understandable concerns of the GA and S&R communities to the original Sponsor Consultation proposal, allied to the multiple layered mitigations proposed by LSA in effectively managing the revised proposal outlined above, it is considered by LSA ATC Management that the updated proposal provides a practical operational solution and is acceptably safe.

12.4. Runway 24 IAP Primary Area Containment

12.4.1. It is proposed that to the north east the CTA with base level 1500ft amsl to contain the IAP Initial and Intermediate Segments at 2000ft amsl should extend only to 12NM from the runway 24 threshold. Thus the extremity of the Primary Areas of the conventional IAPs would not be fully contained, although the RNAV IAPs, including Initial Approach Waypoint Fix Tolerances would be fully contained.

12.4.2. Safety Argument

- The NDB/base turn procedures are rarely used as published other than for training purposes during the daytime period, when radar monitoring is normally available;
- The normal method of operation is by radar directed approach, which can be retained within the reduced CTA dimensions with the necessary 2NM radar vectoring buffer;
- The nominal ground track of the procedures (extending to approximately 10.5NM from threshold in the base turn) would be fully contained within the CTA at all times and for all variations of the procedure, with a buffer of not less than 1.5NM at the extremity of the turn. This is considered adequate for normal day-to-day IAP navigation, although not to the full 3NM normally required by the recently revised CAA Policy Statement;
- The 'uncontained' portion of the primary protection area is predominantly over the sea, where single-engined GA and S&R operations are less likely; therefore, the volume of non-communicating traffic operating under the CTA is likely to be less with the concomitant reduction in overall risk;
- the DME arc procedures are seldom used and are likely to be utilised even less with the availability and preference for Direct Arrival ILS or RNAV IAPs;
- Between 2330 and 0630, when the full or DME arc or RNAV IAPs are principally used, the 'threat' from aircraft outside the CTA inadvertently penetrating the CTA when an IAP is in progress is substantially reduced as few GA flights operate at night in Class G airspace without contacting an ATS authority;
- LSA has approval for ATM monitoring by the APP controller at night. Therefore surveillance monitoring is available and is effective.

12.5. Missed Approach Procedures for Runways 06 and 24

12.5.1. The Primary Areas for the turning missed approach procedures from both runways 06 and 24 are not fully contained within the revised CTR/CTA configuration. This is normal airspace design practice and is based on the following arguments:

12.5.2. Safety Argument

- The ICAO PANS-OPS procedure design criteria for missed approach procedures specify a nominal procedure design climb gradient of 2.5° (152ft/NM). This results, in procedure design terms, the turn at 1000ft ALT commencing at 9.5NM beyond runway threshold with the Primary Area extending some distance beyond that point. Furthermore, an average bank angle of only 15° is used to determine the nominal ground track during turns.
- It is widely acknowledged that the performance of all aircraft when carrying out a missed approach far exceeds the minimum specified by ICAO for obstacle clearance purposes alone and normally exceeds the minimum climb performance specified for normal departure obstacle clearance (3.3% - 200ft/NM). Similarly, bank angles used in practice are comparable with those used in normal departing flight.
- Furthermore, under normal circumstances radar vectoring would be utilised to position aircraft for a subsequent approach. Coupled to this, the occurrence of missed approaches as a proportion of overall arriving traffic is exceptionally small.

12.5.3. Thus, for airspace design purposes, it is normal airspace design practise to ignore the exceptionally large nominal Primary Areas derived from the PANS-OPS Missed Approach criteria and, instead, rely on aircraft performance and containment commensurate with normal departure operations.

12.6. Departures via EVNAS

12.6.1. CAP778 and the recently revised Policy Statement on controlled airspace containment state that SID procedures[21] from aerodromes within controlled airspace should remain wholly within controlled airspace and provide connectivity with the en route ATS Route System.

12.6.2. Whilst it is operationally essential that SID procedures should continue to be in place from LSA to provide linkage to the en route ATS Route System the competing safety requirements of:

- Ensuring vertical separation below other overlying routes within the LTMA;

[21] The term SID is now extended to include the term Preferred Departure Route (PDR) as historically used for procedures outside controlled airspace. The CAA has agreed that formal SID procedures will not be introduced within the LSA controlled airspace until NATS LAMP Phase 1a is implemented in the overlying LTMA. The use of the existing procedures will continue for the interim period prior to the introduction of formal SID procedures.

- The general presumption against stepped climbs being incorporated in SID procedures where there is a frequency change required;
- The NATS Safety Management Route Spacing Requirements in the London TMA;

all preclude the introduction of vertically profiled SID procedures which are fully compliant with the containment element of the Policies.

12.6.3. Similarly, the competing requirements of the GA and S&R airspace user communities utilising the airspace to the west of LSA requires that an emphasis is placed on reducing to an absolute minimum the extent of the controlled airspace required.

12.6.4. Thus, LSA considers that full containment of the departure procedures as far as LAM VOR is not essential because:

- The climb profile of the departure procedures from both runways 06 and 24 towards EVNAS, including the noise abatement requirement, are fully contained within controlled airspace to 3000ft ALT;
- Empirical evidence of the day-to-day operation of the PDRs, with or without associated tactical routing, from LSA demonstrates that controlled airspace containment can be assured through early tactical climb clearance for departing aircraft;
- The precedent set by the level capping of London City Airport SIDs and associated ATC requirement to ensure controlled airspace containment has demonstrated an adequate level of safety;

12.6.5. On balance, therefore, the considerable operating concerns of the GA and S&R aviation community outweigh the CAA procedure design regulatory requirements when CAT aircraft are unlikely to actually utilise, on a day-to-day basis, the airspace required solely for procedure design regulatory compliance.

12.7. DME/DME Coverage for RNAV operations

12.7.1. DME/DME coverage is covered at paragraph 9.5.3. The negligible shortfall in DME/DME coverage identified to the south and south-west extends only between 500ft aal to 545ft aal. DEMETER predictions show that adequate DME/DME coverage with 'Excessive Redundancy' exists above 545ft aal (600ft amsl).

12.7.2. Any traffic below 5.7 tonnes Maximum Take-off Mass (MTOM) and operating under IFR on departure will have to comply – as a minimum - with the Omni Directional Departure requirements that preclude a turn below 500ft aal (runway 06 – heading to the north-east) or 700ft (runway 24 – heading to the south west). Aircraft above 5.7 tonnes MTOM are required to climb straight ahead to 1,500ft ALT or a specific LSA DME distance before turning. Therefore, all aircraft will be terrain and obstacle safe until adequate DME/DME cover is established and rapidly improving.

12.8. Shoeburyness Danger Area Complex D136/138/138A/138B

12.8.1. Throughout the development of the proposed LSA controlled airspace and the Post-Sponsor Consultation Reviews of the proposed airspace configuration the proximity of the Shoeburyness D136/D138 Danger Area (DA) complex has been continuously taken into account.

12.8.2. Of particular concern has been the development of a new offshore holding pattern for LSA arrivals to the north-east of LSA and the associated Primary Area containment of the holding pattern.

12.8.3. Whilst the ATS Route JACKO – TRIPO – SPEAR has been in use for many years as a route adequately separated from the DA and its associated activity, the Primary Area of a terminal holding pattern established on that route and aligned JACKO-TRIPO overlaps the DA boundary.

12.8.4. The originally proposed terminal holding pattern at TRIPO itself resulted in some overlap of the Primary Area with D138A and D138B at the proposed holding levels. However, it was considered that the overlap was adequately mitigated because:

- The holding orientation is away from the DA complex;
- The holding pattern is speed limited to reduce the holding primary area dimensions;
- Surveillance monitoring of holding traffic is available;
- Empirical evidence of many years of monitoring aircraft holding performance in terminal airspace indicates that aircraft seldom deviate from the nominal track of a holding pattern.

12.8.5. However, the proposed relocation of the terminal holding fix to a position GUNFY approximately 1NM east of TRIPO as a consequence of the Post Sponsor Consultation airspace reviews has resulted in a much smaller overlap of D138B, which is active only occasionally, when notified, up to 5000ft amsl and a smaller overlap of D138A. The revised configuration of the offshore hold, now located at GUNFY, is depicted at **Appendix H**.

12.8.6. To cater for the rare occasions when D138B is active and holding is taking place at one or more levels, then LSA considers that radar monitoring of holding traffic, together with the aforementioned holding pattern orientation as acceptable mitigation and resolution of any navigational deviation of aircraft towards the DA boundary.

12.9. Integration with LTC procedures

12.9.1. Safety assurances to satisfy both the LSA and NATS SMS are necessary to ensure the safe separation of aircraft under the separate jurisdiction of each unit when traffic or routes are in proximity to each other.

12.9.2. As detailed in **Section 9** above, for LSA departure procedures level capping of procedures at 3000ft ALT is necessary to ensure the vertical spacing of converging traffic before direct contact with a radar controller is established. In addition, pre-departure release co-ordination will continue to be an LTC requirement.

12.9.3. For arriving traffic to LSA, the interaction between traffic inbound to runway 06 against LCY traffic outbound towards the east is expected to be resolved by Buffer Zone arrangements and agreed procedures similar to those used during the period of the Olympics Temporary Controlled Airspace arrangements. However these arrangements are not yet fully developed and discussions with NATS is ongoing.

12.10. General Aviation Safety

12.10.1. Of concern to the GA and S&R aviation community as reflected in the response to Sponsor Consultation was the potential reduction in safety for those airspace uses who choose, for whatever reason, not to enter or who cannot access controlled airspace. However, it was evident that a significant number of that community were of the firm belief – erroneously - that the carriage of a transponder was a prerequisite for clearance to enter Class D airspace. It was considered that the increased density of air traffic around the periphery of the proposed controlled airspace, and particularly in proximity to a number of peripheral aerodromes, increased risk.

12.10.2. LSA emphasises that the selection of Class D airspace classification does not exclude any category of aircraft from accessing the airspace, whether operating under IFR or VFR, subject only to ATC clearance and complying with ATC instructions. Similarly the LSA ethos is to facilitate access to the Southend CTR/CTA to all classes of airspace user to the maximum extent practicable commensurate with the provision of a safe airspace environment.

12.10.3. However, LSA accepts that a proportion of the airspace users who currently utilise the airspace under its Class G classification will not seek to access it under a Class D classification.

12.10.4. It is not possible to quantify the numbers of aircraft likely to be 'displaced'. Records are not kept of the totality of aircraft operations outside controlled airspace and therefore the change to the level of risk cannot be quantified.

12.10.5. A proportion of transiting airspace users currently request an ATS from LSA ATC under the auspices of the Lower Airspace Radar Service (LARS) and normal airport Approach Control functions. It is reasonable to presume that these airspace users would not be averse to requesting a transit clearance through the controlled airspace as necessary. Similarly a proportion of training flights currently voluntarily communicate with LSA ATC and participate in an ATS and it is reasonable to presume that the majority of these airspace users would also be able to request a clearance within the CTR/CTA. Furthermore, it is reasonable to presume that a proportion of those airspace users who currently choose not

to communicate with an ATS Unit are, nonetheless, suitably equipped and licensed to request a clearance to access the controlled airspace should they wish to.

12.10.6. Conversely, pilots of aircraft who choose to operate in Class G airspace do so under the premise that 'See and Avoid' is the main means of ensuring safety. Indeed, a large proportion of these pilots cite the effectiveness of 'See and Avoid' as their principle safety argument against the establishment of any CAS. Consequently, pilots operating in Class G airspace without reference to an ATS should be fully aware that they are operating in a busy and congested airspace environment. Therefore, they accept that they are wholly responsible for their own safety through the application of the RotAR rules for avoiding collisions and must take that into account in the pre-planning and operation of their flights.

12.10.7. LSA considers that the substantial reduction in the overall volume of the proposed Southend CTR/CTA consequential to the post-Sponsor Consultation airspace review facilitates the distribution of 'non-participating' flight operations over a much greater area and thereby dilutes the perceived, but unquantifiable, 'choke point' risks to flight safety.

12.11. Conclusion

12.11.1. LSA has used sound Safety Management principles throughout the development of the controlled airspace configuration detailed in this ACP.

12.11.2. LSA has taken due regard of the safety concerns of the GA and S&R aviation community to the maximum extent practicable in developing a revised airspace configuration following Sponsor Consultation. In developing the revised airspace configuration LSA has taken due regard of, inter alia, recently issued CAA Policy Statements on Airspace Classification, Radio and Transponder Mandatory Airspace; Procedure Containment and SID Truncation.

12.11.3. Where the PANS-OPS IFP Primary areas are not fully contained within the controlled airspace or does not otherwise meet in full the variously specified Policies, LSA has developed suitable safety arguments to justify each derogation and will conduct a Safety Assessment (HAZID) in each case.

12.11.4. Furthermore, the interaction of LSA procedures and operations with those in the overlying LTMA are configured to meet the NATS Safety Management requirements for vertical and lateral spacing of procedures.

12.11.5. LSA concludes that the controlled airspace configuration detailed in this ACP will provide for adequate safe containment of passenger carrying CAT flights at the critical stages of flight below the LTMA, whilst providing both safe access to the CTR/CTA by other airspace users and sufficient remaining uncontrolled airspace to allow the safe operation of those pilots who cannot, or do not wish to, enter controlled airspace.

PART C

ENVIRONMENTAL REPORT

13. Environmental - General

13.1. Overview

13.1.1. The CAA requires that sponsors of an airspace change take due regard of the need to reduce, control and mitigate as far as possible the environmental impacts of aircraft operations, including the disturbance caused to the general public arising from aircraft noise and emissions from aircraft engines.

13.2. Impact

13.2.1. The environmental impact of the proposed airspace arrangements, both with regard to the impact of LSA operations themselves and the possible impact that the changes to the airspace arrangements might have on the operation of other aircraft in proximity to the proposed controlled airspace, has been considered by LSA throughout the airspace development process, in parallel with aircraft safety and the competing needs of other airspace users.

13.2.2. Throughout the development of this ACP, the LSA objective has been to minimise changes to the current operation of aircraft at low level and to minimise any adverse environmental effects of the proposal, subject to the overriding requirements of flight safety. This has been achieved for Phase 1 of the introduction of the Southend CTR/CTA.

13.2.3. However, for Phase 2 of the airspace development, when formal SID and STAR procedures are introduced, some changes may be necessary to nominal ground tracks for arriving and departing aircraft beyond the immediate vicinity of the Airport as a consequence of the definitive LAMP airspace configuration and route structure. Whilst the progressive development of the NATS LAMP airspace configuration through the design and simulation stages has given some indication of the potential route structures for LSA arriving and departing traffic flows, until the definitive LAMP procedures and airspace configuration are defined, then LSA procedures cannot be formally developed and submitted with this ACP. Any such changes that materialise will be the subject of a separate ACP for the formal introduction of SID and STAR procedures as appropriate.

13.2.4. An unquantifiable environmental benefit will accrue overall from the introduction of controlled airspace as a consequence of the reduction in conflict resolution against unknown traffic at low level comprising repositioning of flights, extended routing and ground delay.

13.2.5. With respect to forecast traffic growth, this is not dependent on the provision of controlled airspace. The case for controlled airspace is based on safety and the most effective operation of the airspace as a whole rather than as an enabler for traffic growth. Thus, the environmental statement submitted to the Planning Authorities in 2009 with the Planning Application for the runway extension remains extant but is not a factor in the development of this ACP.

13.2.6. Throughout the development of this ACP, the Airport Consultative Committee (ACC) has been appraised of the proposals, in particular of the routing and operation of CAT flights in proximity to LSA and has voiced its support for the re-introduction of controlled airspace in the vicinity of LSA.

14. Environmental - Noise

14.1. Introduction

14.1.1. As stated in **Section 13**, a primary objective of LSA in developing this ACP has been to minimise changes to the current operation of CAT flights in proximity to LSA, both for the initial interim phase of the airspace development and, at the later stage following NATS implementation of the LAMP Phase 1a airspace arrangements in the LTMA.

14.1.2. This Section outlines the assessments carried out by LSA into the potential environmental impact of the introduction of controlled airspace in the vicinity of LSA, both with regard to LSA arriving and departing flights and with regard to GA and S&R flights which elect to remain outside controlled airspace.

14.2. Noise Abatement Procedures

14.2.1. The published Noise Abatement Procedures for LSA (as published in UK AIP AD 2.EGMC-11 paragraph AD2.21) do not change as a consequence of this ACP.

14.2.2. For runway 06, aircraft must climb straight ahead until both DME1.0 and 1500ft altitude are reached (i.e. DME1.0 or 1500ft whichever is the later). From runway 24, aircraft must climb straight ahead until both DME2.5 and 1500ft altitude are reached (i.e. DME2.5 or 1500ft whichever is the later).

14.2.3. Runway 24 is in use for approximately 60-70% of the time (due to the prevailing winds) although a Noise Preferential runway scheme specifies that runway 06 should be the preferred runway for departures and runway 24 the preferred runway for arrivals subject to overriding ATC or pilot safety, performance or separation requirements.

14.2.4. A study of data from the LSA Noise and Track Keeping Monitoring (NTK) equipment has indicated that from runway 24 almost all departing jet aircraft have achieved 1500ft well before reaching DME2.5. For departing non-jet aircraft, whilst some have achieved 1500ft by DME2.5, a number of aircraft require to continue straight ahead beyond DME2.5 in order to reach 1500ft before turning. The latest turning point was seen to be in the vicinity of DME3.75 for the poorest performing aircraft.

14.2.5. After the completion of the noise abatement requirement aircraft may turn left or right either on their own navigation to the next point on their route or, more frequently, on radar-directed tracks necessary for the integration of flights into the LTC Thames Radar sector traffic flows or to avoid unknown traffic below controlled airspace.

14.2.6. No fixed ground tracks are specified for departing aircraft beyond DME1.0 (runway 06) or DME2.5 (runway 24) and so dispersion of departing traffic is a long established, and acceptable, feature in LSA operations.

14.3. Departure Procedures

14.3.1. As detailed in **Part B** of this ACP, for aircraft departing to the Airways System a number of Preferred Departure Routes[22] (PDRs) are established for flight planning purposes which include initial routing beneath the LTMA, albeit that traffic seldom follows the nominal PDR.

14.3.2. As noted in **Part B** of this ACP, the proposed airspace configuration has, of necessity, had to be designed to a phased approach so as to be compatible with both the pre-and post-LAMP Phase 1a LTMA configurations. Stage 1 of the LSA airspace implementation will reflect the current (pre-LAMP) LTMA arrangements and route structures and Stage 2 will introduce formal SID procedures compatible with the LAMP Phase 1a LTMA arrangements.

14.3.3. As a consequence of the uncertain timing of the introduction of NATS LAMP Phase 1a LTMA arrangements for London City Airport and the immature route structure of the LAMP Phase 1a arrangements at the time that the LSA ACP was under development, the decision was taken early in the airspace development process that formal SID procedures would not be introduced co-incident with the introduction of controlled airspace. Instead, aircraft would continue to use the extant PDRs and tactical radar vectoring arrangements until such time as the NATS LAMP Phase 1a LTMA arrangements were introduced. Terrain and obstacle clearance will be assured by the imminent introduction of Omni-Directional Departure procedures (not associated with this ACP) that wholly integrate with, and accommodate, the existing Noise Abatement Procedures; i.e. compliance with the Noise Abatement Procedures assures terrain and obstacle clearance.

14.3.4. This decision was taken, with the agreement of both NATS and the CAA, in order to avoid multiple public consultations on: the establishment CAS (this ACP), the development of formal SID procedures based on the Pre-LAMP LTMA arrangements, followed by a repeat Sponsor Consultation some months later if the eventual LAMP route structure require changes to LSA departure routes and procedures.

14.3.5. Thus, it is seen that for the purposes of this ACP, no changes will take place to any noise abatement procedures or to the way in which departing aircraft are handled and integrated into the extant LTC route structure. The introduction of Stage 1 of the proposed controlled airspace is thus entirely neutral with respect to departing IFR traffic from LSA.

14.3.6. However, it is anticipated that a small, but unquantifiable, environmental benefit would accrue from the introduction of controlled airspace insofar as all air traffic in the area would be known and managed. Consequently the need to radar vector departing CAT

[22] The terminology Preferred Departure Route was introduced by DAP in the 1980s to differentiate to pilots those instrument departure procedures which lay outside controlled airspace and were not subject to the full obstacle clearance and procedure design requirements of SID procedures within controlled airspace. However, in a new controlled airspace containment Policy Statement issued on 31 January 2014 the SARG stated that the term PDR would be withdrawn and replaced by the terminology “Omni-Directional Departure”.
For the purposes of this ACP the term PDR will be used throughout to reflect the long-standing procedures and nominal routes where they will continue to be used within the phased controlled airspace framework.

flights around unknown GA flights would diminish and, in turn, the more efficient transfer of departing CAT flights to the Thames Radar sectors would enable earlier climb clearance to be issued.

14.3.7. A study of data from the LSA NTK equipment of achieved aircraft altitudes on departure has shown that, notwithstanding the vertical constraints on the published departure procedures for route and traffic integration purposes, aircraft are consistently given climb clearance by ATC on a tactical basis and routinely achieve levels within the LTMA considerably in advance of the published altitude limitation points. It is anticipated that the improved inter-ATC unit interfaces that will come with the introduction of controlled airspace will further improve the routine climb profiles of departing aircraft.

14.4. Future SID Procedures

14.4.1. As detailed above, resulting from the immaturity of NATS LTMA configuration for the LAMP initiative during the development of the LSA ACP, it has not proved feasible to develop formal SID procedures from LSA which could be assured as remaining compatible with NATS eventual post-LAMP Phase 1a LTMA configuration.

14.4.2. Throughout the development of this ACP and the separate development of the NATS LAMP airspace configuration, LSA staff have worked closely with the NATS LAMP Development Team to ensure that the LAMP arrangements take due regard of the LSA requirements for the expeditious integration of departing CAT flights into the LTMA.

14.4.3. It is anticipated that formal definitive SID procedures for LSA departing traffic would be introduced co-incident with the implementation of NATS LAMP Phase 1a (provisionally in late-2015). However, as the timetable for this ACP is independent of, and ahead of, the timetable for LAMP Phase 1a, future SID procedures could not be developed as part of this ACP.

14.4.4. Thus, the development of formal future SID procedures for LSA departing traffic will be the subject of a separate ACP including environmental assessment and, if necessary, Sponsor Consultation.

14.4.5. Furthermore, once formal SID procedures are introduced co-incident with the NATS LAMP Phase 1a airspace arrangements it is anticipated that a further improvement in climb profiles of departing aircraft will be forthcoming.

14.5. Arriving Flights

14.5.1. As noted in **Part B** of this ACP, the eventual airspace arrangements for LSA arriving traffic from the Airways System would include a network of formal STAR procedures feeding into a new discrete offshore terminal holding pattern for LSA traffic to the north-east of LSA.

14.5.2. However, as the NATS definitive configuration for the LAMP Phase 1a LTMA arrangements had not been finalised at the submission of this ACP it is not possible to include definitive

future STARs in this ACP, although development/conceptual STARs have been included in Part 5 of the Airspace Review process (CL-4835-Doc-129)

14.5.3. For Stage 1 (pre-LAMP Phase 1a) of the proposed LSA controlled airspace operation, arrival routes and the tactical handling of traffic within the extant LTMA configuration will remain unchanged.

14.5.4. However, it is proposed that the new offshore terminal holding pattern to the north-east of LSA would be introduced at Stage 1 (without the associated new STARs) and would be available for tactical use by LSA ATC where appropriate (i.e. principally for arriving traffic via JACKO – TRIPO should the need to hold arise).

14.5.5. Thus, it is considered that environmental impact of Stage 1 of the operation of LSA controlled airspace will be essentially neutral with respect to traffic inbound to LSA from the Airways System.

14.5.6. However, it is anticipated that a small, but unquantifiable, environmental benefit would accrue from the introduction of controlled airspace in the vicinity of LSA insofar as all traffic in the area would be known and managed. Thus the occasions when arriving flights have to be given extended routing around unknown GA flights, or broken off an approach and repositioned due to 'pop-up' unknown traffic would diminish. A wholly controlled airspace ATM operation would also streamline the LTC/Southend ATC interface to the overall benefit of improved flight profiles.

14.6. Instrument Approach Procedures

14.6.1. As a consequence of objections to the controlled airspace dimensions and configuration proposed in the Sponsor Consultation, LSA conducted a number of detailed reviews of the airspace configuration, as submitted to Sponsor Consultation, in endeavouring to assuage, to the maximum extent practicable, the concerns of the GA and S&R aviation community. The airspace reviews are detailed in **Parts B** and **E** of this ACP and are submitted as separate documents in support of the ACP.

14.6.2. The outcome of the airspace reviews indicated that LSA should commission the introduction of revised IAPs in which the Initial and Intermediate segment altitudes would be raised from 1500ft amsl to 2000ft amsl, thereby facilitating a smaller CTR configuration and the major portion of the IAPs being contained within that CTR and CTA-1 with a base altitude of 1500ft amsl.

14.6.3. Naturally, raising the IAP segment altitudes results in a small increase (by approximately 1.2NM) in the overall length of the procedures which may result in parts of the nominal procedure ground tracks overlying new communities in the vicinity of the revised turn points.

14.6.4. However, LSA has concluded that there would be no measurable environmental impact associated with reconfigured IAPs as the published procedures are seldom used in their

entirety and nominal ground tracks would remain well within the bounds of the airspace and levels routinely and presently used for radar vectoring aircraft towards final approach.

14.6.5. Similarly, the small, but unquantifiable additional fuel burn for the very few aircraft that actually fly the published procedures in full is, on balance, outweighed by the overriding needs of the GA and S&R aviation community.

14.6.6. LSA has concluded that there would be no measurable environmental impact associated with reconfigured IAPs as the published procedures are seldom used in their entirety and nominal ground tracks will remain well within the bounds of the airspace routinely used by aircraft using the present DME-based Direct Approach and DME-arc IFPs and when being radar vectored towards final approach. Therefore, LSA has determined that further Industry or environmental consultation would constitute nugatory effort and should not be necessary to implement this minor change. (Note: The proposed revised IAPs will be submitted to the CAA separately in accordance with the requirements of CAP785.)

14.7. Noise Contours

14.7.1. For Stage 1 of the introduction of controlled airspace in the vicinity, no changes to arriving or departing flight paths are introduced and there is no change to the distribution of flights in the vicinity of LSA. Therefore LSA has not carried out any separate Noise Contour assessment for this ACP.

14.7.2. For the formal introduction of new SID procedures at Stage 2 of the airspace development (i.e. co-incident with the NATS LAMP Phase 1a airspace arrangements) a full environmental assessment of any new or altered routes will be carried out by LSA, including a review of any possible impact on the Airport Noise Contours, and will be the subject of a separate ACP.

14.7.3. Conclusion

14.7.4. For operations by CAT and other flights to and from LSA the introduction of controlled airspace in the vicinity of LSA will be neutral insofar as no changes will be made to the routes or day-to-day handling of flights to and from the Airways System.

14.7.5. Small but unquantifiable environmental benefits are expected to accrue from the fact that all traffic in proximity to LSA would be known and managed and, as a consequence, the need to extend the routing of CAT flights (or otherwise delay them) to avoid unknown GA activity will diminish. Similarly the ability to establish a more efficient ATC interface between Southend ATC and the LTC Thames Radar Sectors is expected to result in more efficient climb and descent profiles for aircraft at the lower levels.

14.7.6. Any subsequent changes to nominal ground tracks arising from the need to configure the LSA departure and arrival routes to the NATS LAMP LTMA route structure will be the

subject of a separate ACP once the final configuration and timetable for introduction of the NATS LAMP airspace arrangements are known.

15. Environmental – GA Traffic

15.1. Overview

15.1.1. A large number of objections to the proposed airspace configuration were received from the GA and S&R aviation communities and others in response to the Sponsor Consultation.

15.1.2. Objections relating to the environmental impact of the proposal so far as it pertained to the GA and S&R aviation community included:

- The creation of a number of perceived 'Choke Points' around the periphery of the CTR in which there might be a concentration of GA flights 'forced' to operate in narrow corridors and at lower altitudes;
- For the large number of GA and S&R aerodromes peripheral to the proposed controlled airspace, a potential adverse environmental reaction due to increased low-level transiting aircraft perceived, by communities, as attributable to peripheral aerodrome operations;
- A number of community consultees felt that they were already blighted by GA and S&R flights.

15.1.3. LSA has taken these environmental concerns, alongside the associated flight safety concerns, seriously and through the post-Sponsor Consultation airspace reviews has been able to substantially reduce the volume of controlled airspace extending down to the surface and to substantially ease the impact of the proposal on the peripheral aerodromes and the GA community in general.

15.1.4. LSA emphasises that the selection of Class D airspace classification does not exclude any category of aircraft from accessing the airspace, whether operating under IFR or VFR, subject only to obtaining ATC clearance and complying with ATC instructions. Similarly the LSA ethos is to facilitate access to the Southend CTR/CTA to all classes of airspace user to the maximum extent practicable commensurate with the provision of a safe airspace environment. It remains a matter of choice, in most cases, for the GA pilot whether to transit through the controlled airspace or remain outside it.

15.1.5. However, LSA acknowledges that in some circumstances it is difficult for non-radio aircraft or gliders to make arrangements for access and, similarly that a proportion of the airspace users who currently utilise the airspace under its Class G classification will not seek to access it under a Class D classification.

15.1.6. It is not possible to quantify the numbers of aircraft likely to be 'displaced' by the introduction of the proposed controlled airspace. Records are not kept of the totality of aircraft operations outside controlled airspace and therefore the change to the environmental impact of the proposed controlled airspace cannot be quantified.

15.1.7. However, it should be noted that a proportion of transiting airspace users currently request an ATS from LSA ATC under the auspices of the Lower Airspace Radar Service (LARS). It is reasonable to presume that these airspace users would not be averse to requesting a transit clearance through the controlled airspace as necessary. Similarly a proportion of training flights currently voluntarily communicate with LSA ATC and participate in an ATS and it is reasonable to presume that the majority of these airspace users would also be able to request a clearance within the CTR/CTA. Furthermore, it is reasonable to presume that a proportion of those airspace users who currently choose not to communicate with an ATS Unit are, nonetheless, suitably equipped and licensed to request a clearance to access the controlled airspace should they wish to. For flights falling under these categories the environmental impact of the proposed controlled airspace would be neutral.

15.1.8. Conversely, pilots of aircraft who choose to operate in Class G airspace accept that they are responsible not only for their own safety but also for the environmental impact of their flights on communities on the ground. Pilots operating in the airspace without reference to an ATS should be aware that they are exposed to a busy and challenging airspace environment and must take that into account in the planning and operation of their flights.

15.1.9. Communities that felt that they were blighted by GA flights were often located close to busy GA airfields, or close to areas where the aircraft from these airfields choose to operate when manoeuvring or training. Insofar as most of these areas are already established in localities that are away from LSA (in order to operate with prominent visual references and to minimise conflict with Southend traffic patterns and ATC intervention), it is expected that these areas would remain in use for the same reasons.

15.2. Conclusion

15.2.1. LSA has taken due regard of the safety and environmental concerns of the GA and S&R aviation community, and of communities on the ground, of the impact of the proposal on GA operations in proximity to the proposed controlled airspace.

15.2.2. LSA has taken steps, through the Post-Sponsor Consultation airspace reviews and the committal of financial resource to developing reconfigured IAPs, to assuage the concerns to the maximum extent practicable.

15.2.3. LSA considers that the substantial reduction in the overall volume of the proposed Southend CTR/CTA consequential to the post-Sponsor Consultation airspace reviews facilitates the distribution of 'non-participating' flight operations over a much greater area and thereby dilutes the perceived, but unquantifiable, adverse environmental effects of the proposed controlled airspace on GA and S&R aviation activity.

16. Environmental - Carbon Assessment and Climate Change

16.1. General

16.1.1. It is recognised that aircraft do contribute to carbon dioxide (CO_2) emissions and this may have an impact on climate change. A responsible approach to airspace planning is to strike a balance between competing demands and ensure that the most direct routes possible are used, commensurate with optimal aircraft performance, as this will minimise fuel burn and may therefore reduce any impact on climate change.

16.1.2. Under the existing airspace arrangements LSA CAT traffic frequently has to be diverted from the most direct routings or efficient climb and descent profiles in order to maintain the prescribed de-confliction minima from unknown traffic operating in the vicinity of LSA. Furthermore, this action can also delay transfer of departing aircraft to LTC Thames Radar Sectors which can, in turn, delay clearance for aircraft to climb to higher levels. The introduction of controlled airspace would reduce the need to extend the routing of aircraft in the immediate vicinity of the airport.

16.1.3. The anticipated improvement of transfer of control arrangements between LSA and NATS LTC is expected to enhance the opportunity for better climb profiles and descent profiles for CAT flights, which will reduce fuel burn and emissions. However, it must be equally recognised that the lower levels of the LTMA are highly congested and dictate that higher initial operating levels (to achieve continuous climb through procedure design) cannot be specified within the flight procedures for departing aircraft due to the interactions with other routes and traffic in the LTMA and the safety requirements for terminal airspace operations. The safety requirements for the separation of aircraft must always take priority over the desire for 'built-in' unrestricted climb or descent.

16.1.4. For arriving flights, the ability to remain at higher levels for longer must be balanced against the slightly longer routings involved.

16.1.5. For Stage 1 (pre-LAMP Phase 1a LTMA airspace arrangements) of the LSA ACP, the route structure and ATC operating procedures within the LSA controlled airspace would remain essentially as they are today. The benefits would accrue from the fact that all aircraft in the vicinity of LSA are known and managed and, consequently, the delay and repositioning of CAT flights against unknown traffic would be reduced, but by an unquantifiable amount.

16.1.6. For Stage 2 (post LAMP Phase 1a LTMA arrangements), the introduction of formal SID procedures will be the subject of a separate ACP. The carbon assessment and climate change aspects of the NATS LAMP Phase 1a airspace configuration, within which LSA STAR procedures will be embedded, have been detailed within NATS' consultation document on the proposed LAMP airspace configuration for the London TMA.

17. Environmental - Local Air Quality

17.1.1. Technical guidance material from the CAA does not require LSA to make an assessment of air quality as neither the airport nor the surrounding airspace lie within an Air Quality Management Area (AQMA).

18. Environmental - Tranquillity and Visual Intrusion

18.1.1. Although difficult to measure, the potential visual intrusion and impact on tranquillity is recognised. Ultimately, the improved flight profiles for CAT flights would result in such flights operating at higher levels for a greater part of their flights.

18.1.2. Close-in to the Airport, there will be no changes to the routing of aircraft in carrying out the noise abatement procedures or IAPs on final approach.

18.1.3. VFR flights will be integrated and will conduct their operations in essentially the same manner as they are under the current airspace arrangements. Thus, in this respect it is anticipated that the proposed controlled airspace would not have a significant impact nor affect the tranquillity of the countryside to any greater than that experienced today.

18.1.4. As noted in **Section 15**, it is acknowledged that a proportion of GA and S&R flight activity will, for various reasons, choose not to operate within controlled airspace and are thus likely to be displaced to other operating areas or to lower levels than currently used. LSA has taken steps through the post Sponsor Consultation airspace reviews to reduce the overall volume of controlled airspace to the absolute minimum practicable dimensions in order to minimise the impact on GA and S&R operations as far as is practicable.

18.1.5. However, it can be assumed that the reduction in the requirement to extend the routing of CAT aircraft around unknown traffic in the vicinity of LSA and the consequent repositioning of aircraft at low level would be a benefit. However, such benefit would be unquantifiable due to the random nature of the hazards to which flights are currently exposed.

18.1.6. The ability to hold aircraft over the sea at the new terminal holding facility will, when fully used in association with the new STARs to be introduced in conjunction with the LAMP development, largely remove the requirement for larger aircraft to hold overhead Southend Airport as the do at present in the event of landing delays caused by adverse weather or runway non-availability etc. This will confer an environmental benefit to the urban areas around the airport.

PART D

ECONOMIC IMPACT

19. Economic impact

19.1. The requirement to establish controlled airspace in the vicinity of LSA is based on safety and the efficient use of airspace rather than any economic arguments.

19.2. The approved development of the Airport and future traffic growth are not dependent on the provision of controlled airspace, nor is the provision of controlled airspace an enabler for airport development and traffic growth.

19.3. However, a number of potential economic dis-benefits were identified for non-LSA aircraft operations by consultees, principally the operators of nearby GA aerodromes and the operators of GA flying training organisations. Perceived economic impacts included

- Increased flying time (and thereby cost) to access 'free' airspace;
- Delays to flight operations as a consequence of needing to obtain ATC clearance and comply with ATC instructions;
- Loss of business due to the increased costs of the impacts detailed above;
- Possibility of aircraft operators and manufacturers moving away from the south-east region as a consequence of the proliferation of controlled airspace;

19.4. LSA considers most of these perceived dis-benefits to be largely unfounded. The majority of aircraft operating in the area are equipped to operate within Class D controlled airspace and the LSA ethos is to facilitate access to the Southend CTR/CTA to all classes of airspace user to the maximum extent practicable commensurate with the provision of a safe airspace environment. It remains a matter of choice, in most cases, for the GA pilot whether to operate in or transit through the controlled airspace or to remain outside it.

19.5. Furthermore, the substantial reduction of the controlled airspace footprint as a consequence of the post-Sponsor Consultation review carried out by LSA has substantially reduced the potential for the adverse impacts identified by consultees to materialise.

19.6. However, LSA acknowledges that in some circumstances it is difficult for non-radio aircraft or gliders to make arrangements for access and, similarly that a proportion of the airspace users who currently utilise the airspace under its Class G classification will not seek to access it under a Class D classification. For these airspace users there may be some economic impacts, albeit unquantifiable in the context of overall airspace utilisation, from selecting other areas in which to conduct their operations.

19.7. Conversely, the provision of controlled airspace will result in a measure of economic benefit to CAT airspace users arising from the reduction in extended routing, repositioning or ground delay to flights caused by 'unknown' or 'pop-up' traffic in proximity to LSA arrival and departure flight paths. Similarly, the improved LTC/LSA ATC interface provided by a wholly controlled airspace operating environment is expected to result in more efficient flight profiles for arriving and departing CAT flights.

19.8. Economic impact of NATS LAMP arrangements

19.8.1. It is anticipated that the future configuration of STARs for LSA arriving flights in particular will result in some longer published track distances than are currently in place. This is outlined in the NATS Sponsor Consultation Document on the proposed LAMP airspace arrangements.

19.8.2. However, the possible increased track mileage must be balanced against the objective of improved LTMA airspace efficiency overall and the potential for substantial tactical direct routing when the Shoeburyness DA activity and other LTMA traffic flows so permit.

19.8.3. For future SID configuration in the LAMP LTMA arrangements it is anticipated that nominal routing beyond the Noise Abatement procedures will be largely commensurate with the Stage 1 airspace arrangements in place today, although on a more structured and therefore repeatable basis. Economic impact would therefore be minimal, other than that more efficient flight profiles should accrue. The introduction of formal SID procedures will be the subject of a separate ACP once the final configuration of the LAMP LTMA route structure, including TMA link routes, is established.

19.9. Conclusion

19.9.1. LSA has taken due regard of the concerns of the GA and S&R aviation communities of the perceived economic impact of the proposal on GA operations and aerodrome operators.

19.9.2. LSA has taken steps, through the Post-Sponsor Consultation airspace reviews and the committal of financial resource to developing reconfigured IAPs, to assuage those concerns to the maximum extent practicable.

19.9.3. LSA considers that, on balance, the economic impact of the proposed controlled airspace on the GA and S&R aviation communities will be minimal, whilst benefits will accrue to the CAT aviation community through improved flight profiles and the reduction in extended routing and delay.

PART E

SPONSOR CONSULTATION REPORT

20. Summary of the Sponsor Consultation

20.1. Overview

20.1.1. This Section of the ACP details the various levels of Sponsor Consultation and engagement that have taken place in the development of the proposed controlled airspace. A number of supporting documents and associated correspondence are referenced and submitted separately as detailed in **Appendix B** of the ACP.

20.1.2. Throughout the development of this ACP, LSA has adhered closely to the principles set out in CAP725. Engagement with both aviation and non–aviation stakeholders has been at the forefront of the airspace development.

20.1.3. The ACC has been regularly appraised of the progress of the ACP Project and has been fully supportive throughout.

20.2. Engagement with the CAA

20.2.1. From the outset of this Project LSA has maintained a close engagement with the CAA DAP, both through the appointed Case Officer and others. Advice has been sought where necessary and, in other instances, guidance has been offered and accepted. Where there has been conflict between the regulatory requirements and the practicalities of balancing the competing airspace user objectives the DAP staff have been receptive to innovative suggestions.

20.2.2. Furthermore, the LSA airspace development team has kept abreast of changes to DAP Policies as they have emerged and have taken full account of such changes as the proposed airspace configuration has developed. Where necessary previously determined aspects of the airspace configuration have been readdressed in the light of emerging Policies.

20.2.3. In accordance with the provisions of CAP725, a Framework Briefing was held at CAA House on 27 February 2013 at which an embryo Framework Document [CL-4835-ACP-012] was presented and discussed, together with a detailed discussion of the Airspace Change Process. The Minutes of the Framework Briefing is submitted separately [CL-4835-MIN-13].

20.2.4. Strictly in accordance with the CAA's impartial remit, further informal meetings and discussions between the LSA airspace development team and the DAP staff have taken place at various points in the ACP development. DAP staff have maintained regulatory oversight of the various discussions between LSA and NATS with respect to the emerging LAMP airspace arrangements and have provided particularly helpful advice in this area.

20.3. Preliminary discussions with airline operators

20.3.1. As a first step towards the development of controlled airspace and associated aircraft operating procedures a survey of airline operators using the airport was undertaken to ascertain the level of RNAV equipage and aircraft climb performance capabilities.

20.3.2. Specific informal meetings were held with easyJet Fleet Management and Operations staff to consider RNAV capabilities and the particular aspects of developing a future RNP SID procedure from runway 06 turning towards the D138 DA complex. [CL-4835-MIN-40]

20.4. Engagement with QinetiQ

20.4.1. At the outset of the airspace development project a number of informal meetings were held between the LSA airspace development team and the EG D136/8 Operating Authority, QinetiQ, to discuss the growth of CAT operations at LSA and to consider whether any changes could be made to the configuration of the DA complex to improve interoperability of the airspace and reduce the impact on CAT flights to and from the south. [CL-4835-MIN-039]

20.4.2. QinietiQ staff have been most helpful in this respect and a number of possible options for internal reconfiguration of the DA complex have been taken forward.

20.4.3. However, due to the pressing timetable for the development of this ACP and various institutional issues concerning the reconfiguration of the DA complex it was decided at an early stage that any changes to the DA complex would be progressed outside the ACP project. The controlled airspace development would not be dependent upon changes to the DA configuration; any changes to the DA configuration that could be implemented separately would be of benefit to the overall management and interoperability of the airspace as a whole, regardless of its controlled airspace (or otherwise) status.

20.5. Focus Groups

20.5.1. Having established a baseline case and preliminary design for the establishment of controlled airspace in the vicinity of LSA, Focus Groups were established in accordance with the provisions of CAP725, to enable the LSA airspace development team to seek the views of local airspace users and local environmental interests on the implications of controlled airspace on their operations and interests.

20.5.2. Four Focus Groups were established as follows:

- FG1: Local Airspace Users
- FG2: Local Non-Aviation Interests
- FG3: Off-Airport Airspace Users

- FG4: ATS Focus Group[23]
- In addition, the Military Airspace Users Co-ordination Team (MUACT) has also been appraised separately of the proposals.

20.5.3. As Focus Group participants would be unlikely to be familiar with the airspace change process and the role of Focus Groups within the process a copy of the Framework Document was distributed to participants.

20.5.4. A series of Focus Group Meetings were held on 19/20 March 2013 at which the Focus Group members were appraised of the airspace change process, the rationale for the re-introduction of controlled airspace, the regulatory requirements for airspace design and the preliminary proposed airspace configuration. The Notes of the Focus Group Meetings are at CL-4835-DOC-63 to -66 respectively.

20.5.5. The views of participants were sought and, whilst the locally-based airspace users and the non-aviation interests were fully supportive of the proposal, the Off-Airport Airspace Users were vociferous in their opposition to any controlled airspace development in the area. Participants were invited to submit further written comment outside the Meetings and a number of Off-Airport participants did so. However, it should also be recorded that suggestions as to specific, practical changes that could be considered by LSA were requested but none were received.

20.5.6. Whilst endeavouring to involve a representative cross-section of the airspace user community, particularly for the myriad of Off-Airport Airspace Users, without the resulting FG becoming too large and unwieldy (as referenced in CAP725), FG participants were asked to take into account the operations of the wider spectrum of airspace users in the locality in addition to their own direct interests. However, it later became evident that this request went unheeded and little, if any, wider engagement was undertaken. This limitation generated some backlash at the later stage of formal Sponsor Consultation and, with hindsight, it may have been better to establish two or more Off-Airport Airspace Users Focus Groups in order to directly involve a wider spectrum of the Industry at the earliest stages.

20.5.7. Following the Focus Group discussions, the LSA airspace development team undertook a detailed review of the preliminary airspace configuration, taking into account the views expressed by the Focus Groups, to determine whether any adjustments could be made

[23] The ATS FG comprised, principally, NATS LTC and Manston ATS Units and initial (separate) discussions and Meetings were held under the auspices of the Focus Group structure. However, due to the complexities of the airspace arrangements and the emerging NATS LAMP airspace development (which was not a matter for immediate consideration at the outset of the project) discussions with NATS LTC, NATS LAMP Development Team and Manager ATC Manston Airport have continued beyond the FG stage and into and beyond the formal consultation stage.

which would ameliorate, to the maximum extent possible within the regulatory requirements for airspace design, the concerns of the airspace user community.

20.5.8. A Report of the Focus Group Stage of the airspace change process was compiled, [CL-4835-DOC-71] covering not only the Focus Group stage itself but also the newly emerging NATS proposals for the LAMP project and the particular impact of a Policy decision regarding the configuration of London City Airport SID procedures. A Post-Focus Group Stage Meeting was held on 29 May 2013 [CL4835-DOC-74] and the decision was taken by LSA that the case for the development of controlled airspace remained sound and should be progressed to the next stage.

20.6. Formal Sponsor Consultation Stage

20.6.1. Following the Focus Group Stage and the development of a refined airspace configuration, preparations were made for formal Industry and Stakeholder consultation as specified in CAP725.

20.6.2. As noted in **Part B** of this ACP, it was necessary for the refined controlled airspace configuration to take due regard of, and be compatible with, both the pre-LAMP (extant) LTMA configuration and LTC operating requirements and the post-LAMP (proposed) airspace configuration and LTC operating requirements, to the extent that they were emerging.

20.6.3. It should be noted that during this phase of the LSA airspace development NATS were particularly helpful in engaging with LSA in developing the LAMP airspace arrangements and potential route structures for the integration of LSA departure and arrival procedures and ATC operating procedures. LSA operational staff have participated in, and will continue to participate in, NATS real-time LAMP simulations to ensure system compatibility with LSA traffic requirements and the development of post-LAMP operational interfaces.

20.6.4. A detailed summary of the formal Sponsor Consultation is given in **Section 21** below.

21. The Sponsor Consultation

21.1. Introduction

21.1.1. In accordance with the provisions of CAP725 a formal Sponsor Consultation was carried out by LSA between 20 September and 19 December 2013[24], allowing a 13 week period for consultees to consider and respond to the proposal.

21.1.2. The Sponsor Consultation Document (SCD) [CL-4835-DOC-102] is submitted separately. A final Draft was submitted to the DAP for oversight and comment before publication. Comments on certain aspects of the content and presentation raised by DAP were taken on board and the document modified before release to consultees.

21.1.3. The SCD detailed the reasons for the consultation and the consultation methodology as well as detailing the configuration and rationale for the various segments of proposed controlled airspace. It also outlined options/configurations that had been considered and rejected.

21.1.4. It is important to note that whilst the basic case for the re-introduction of controlled airspace stems from safety concerns and a number of airspace incidents that have taken place, on the advice of the DAP no direct reference was made to such concerns or incidents.

21.2. Consultees

21.2.1. A comprehensive list of aviation and non-aviation formal consultees was compiled with the assistance and advice of DAP staff.

21.2.2. Because of the extensive surface footprint of the proposed controlled airspace, including the protection area for the offshore holding pattern, 24 County, City, Borough, District and Town Councils together with 128 Parish Councils were included in the Sponsor Consultation list. 9 other environmental organisations were consulted, together with 22 Members of Parliament.

21.2.3. On the aviation side, the DAP provided the current list of NATMAC representatives and a further 95 on-airport and off-airport aviation organisations were consulted.

21.2.4. In total 314 Stakeholder organisations or individuals were included in the formal Sponsor Consultation list. The full list of consultees is detailed in at Appendix D of the SCD.

21.2.5. However, as advised by DAP, the scope of the Sponsor Consultation should reflect that any individual or organisation over and above the formally listed consultees who considered that they had an interest in, or considered themselves to be a stakeholder, must be given the right to submit a response. Thus the Sponsor Consultation was, effectively, a public

[24] The consultation was originally intended to end on 13 December 2013 but was extended to 19 December 2013.

consultation throughout the areas overlaid by the proposed controlled airspace and throughout the aviation industry.

21.3. Sponsor Consultation methodology

21.3.1. The SCD was uploaded to a discrete link on the LSA website (http://www.southendairport.com/news/controlledairspace).

21.3.2. A Sponsor Consultation invitation letter was distributed to consultees via e-mail detailing access links to the SCD. Electronic distribution of, and website access to, consultation material is acceptable to the CAA and now forms the standard method of undertaking such Sponsor Consultations; recorded page views (electronic 'hits') of the SCD totalled 2058. Paper copies of the SCD were available to consultees on request and 4 copies were distributed in this way.

21.3.3. Consultees were asked to consider the proposal and submit their response to LSA through a discrete e-mail address [redacted] within the Sponsor Consultation period. (A number of late responses were accepted by LSA.)

21.3.4. It was recognised that some non-aviation consultee organisations may not be well versed in aviation industry terminology or the CAA Sponsor Consultation process. Consequently LSA gave those consulted ample opportunity to seek clarification of the terminology used or any other aspects of the proposed airspace design.

21.3.5. Furthermore, in order to ensure that other members of the public who may have had an interest in the proposal would be aware of the Sponsor Consultation, on the advice of the CAA a number of Press Releases were made through local newspapers. Additionally, a number of consultee aviation organisations publicised the Sponsor Consultation on their websites. Thus a wide spectrum of individual airspace users and others were made aware of the Sponsor Consultation.

21.3.6. In order to enable consultees and others to discuss the proposal with members of the LSA team two 'Open Days' were held at the Airport. These were welcomed and appreciated by those who attended.

21.3.7. Five meetings and briefings were held with individuals or groups to explain and discuss issues of concern to particular localities or organisations. Notes of the Meetings are submitted separately.

21.3.8. It was stated in the SCD that individual responses, other than an electronic acknowledgement, would not be sent and that the Report of the Sponsor Consultation would represent the consolidated LSA response to consultees and the issues and themes raised by consultees and others. However, in a number of cases replies were sent giving clarification of possible misunderstandings and dealing with queries about certain aspects of the Sponsor Consultation.

22. Responses to the Sponsor Consultation

22.1. Overview

22.1.1. This Section of the ACP outlines the response to, and outcome of, the Sponsor Consultation in broad terms.

22.1.2. A spreadsheet detailing the correspondence and responses to the Sponsor Consultation is submitted separately at CL-4835-DOC-50.

22.1.3. A statistical and content analysis of the responses to the Sponsor Consultation, including submissions from individuals or organisations that were not on the formal consultee list is given in the Report of the Sponsor Consultation [CL-4835-RPT-160] which is submitted separately.

22.1.4. All correspondence, including responses from consultees, submissions from individuals or organisations not on the Sponsor Consultation list, together with any follow-up or subsequent correspondence, are submitted separately.

22.1.5. It was stated in the SCD that individual responses, other than an electronic acknowledgement, would not be sent and that the Report of the Sponsor Consultation would represent the consolidated LSA response to consultees and the issues and themes raised by consultees and others. However, in a number of cases replies were sent giving clarification of possible misunderstandings and dealing with queries about certain aspects of the Sponsor Consultation. This correspondence is included in the correspondence package detailed above.

22.2. Responses from consultees

22.2.1. In total 191 responses were received from the formal consultees, which represents a response rate of 60.8%. This is considered an adequate response to an airspace Sponsor Consultation.

22.2.2. Of the 191 responses received from consultee organisations:

- 68 (35.6%) supported or had no objections to the proposal. Some support was conditional on resolution or clarification of some concerns: these have been addressed directly with the consultees concerned and are included within the general themes arising;
- 45 (23.6%) stated that they had no comment to make on the proposal;
- 77 (40.3%) objected to the proposal as a whole or to various aspects of the proposal;
- 1 (0.5%) response was non-committal.

22.2.3. A summary table detailing the response rate of the various Consultee groups is given at **Appendix I**. The LSA analysis tables for consultee responses are submitted separately at CL-4835-DOC-141 and CL-4835-DOC-142.

22.2.4. It should be noted that 15 of those organisations that objected to the proposal nonetheless supported the principle of establishing controlled airspace or accepted that some measure of controlled airspace may be necessary to protect CAT flights operating to/from LSA but objected to the configuration detailed in the SCD.

22.2.5. The consultee response analysis methodology is outlined below.

22.3. Submissions from non-consultees

22.3.1. In addition to the responses from consultees detailed above, 336 submissions were received from individual pilots or aviation organisations or from members of the public. These submissions are included in the correspondence package detailed above.

22.3.2. Of these submissions 9 supported or had no objection to the proposal, 316 objected in whole or part to the proposal, 6 were queries which were answered by LSA but resulted in no follow up response. A number of submissions made comments that were not relevant to the airspace Sponsor Consultation and 5 submissions had no content pertaining to the LSA airspace proposals.

22.3.3. Many of the submissions received were from individuals or organisations allying their views to strong objections submitted by some Industry representative organisations. These submissions are discussed and analysed in more detail in **Section 6** of the Report of the Sponsor Consultation.

22.4. Analysis of responses

22.4.1. All responses and submissions to the Sponsor Consultation, whether from the formal consultees or from other individuals or organisations were analysed and the key themes and issues of concern identified. The LSA Analysis Table of submissions is submitted separately at CL-4835-DOC-141 and at CL-4835-DOC-142.

22.4.2. For each of the key themes identified LSA has taken a balanced approach in considering and responding to each issue. The consolidated list of the principle issues arising from the consultee responses, together with the LSA consideration of them is given at Appendix C of the Report of the Sponsor Consultation.

22.5. Report of the Sponsor Consultation and feedback to consultees

22.5.1. It was stated in the SCD that the formal LSA response to issues raised by consultees and others would be through the Report of the Sponsor Consultation [CL-4835-RPT-160].

22.5.2. The Report of the Sponsor Consultation was developed from the analysis of consultee and other responses and was posted on the LSA website on 28 February 2014 and updated periodically with minor amendments since. An e-mail was sent to all consultees notifying them of the Report of the Sponsor Consultation and providing links to the website.

22.5.3. As well as the statistical analysis of the response to the Sponsor Consultation, the Report itemises some 57 themes or issues of concern identified in the responses from consultees and others. In each case LSA has developed a response to the issue of concern. In some cases objection issues embraced the whole principle of the development of LSA itself and its suitability, or not, for commercial passenger operations. Other objection themes covered objection in principle to the establishment of controlled airspace and to the dimensions and impact of the controlled airspace needed to meet the regulatory requirements.

22.5.4. The SCD noted that objections to the proposed controlled airspace would be the subject of detailed discussions with the parties concerned to endeavour to resolve the issues of concern. However, given the groundswell of opposition in principle to the proposal throughout the GA and S&R aviation community, coupled with changes in Policy or the application of Policy in the CAA, it was clear to LSA that a fundamental review of every part of the proposed controlled airspace would be needed to try and ameliorate, as far as practicable, the concerns of the GA and S&R aviation community before engaging further with the Industry. This is outlined in **Section 23** below.

23. Post-Sponsor Consultation activity

23.1. Overview

23.1.1. As noted above, the groundswell of opposition to the proposed controlled airspace, principally from the GA and S&R aviation communities, has prompted LSA to undertake a fundamental review of all aspects of the proposal.

23.1.2. Notwithstanding the objections, LSA remains convinced that the basic safety argument for the provision of controlled airspace to enhance the protection of passenger carrying CAT flights in the critical stages of flight immediately after take-off and prior to landing remains sound. Indeed, it could be argued that the case is enhanced by the revelation from the Sponsor Consultation of the sheer volume of uncontrolled flight activity that takes place in proximity to the flight paths of IFR CAT flights. Further, the additional airspace incidents that have taken place since the initiation of the project further confirm the need for controlled airspace protection.

23.1.3. Following the Sponsor Consultation period, in January 2014, discussions with CAA staff indicated that a less prescriptive approach to the dimensions of controlled airspace necessary to comply with the regulatory requirements was under consideration. A revised Policy Statement was issued on 31 January 2014.

23.1.4. Furthermore, by this time the NATS LAMP airspace requirements had become more clearly defined, although the differing timetables for implementation of the two projects could not be aligned due to the urgency, on grounds of flight safety, afforded to the LSA project.

23.1.5. Thus, between January and April 2014 the LSA airspace development team has undertaken a root and branch review of all aspect of the proposed controlled airspace configuration, including consideration once again as to whether a non-controlled airspace solution would be appropriate, in order to ameliorate, to the maximum extent practicable, the concerns of the GA and S&R airspace user community whilst providing an adequate level of airspace safety for growing number of CAT passenger carrying flights

23.1.6. The airspace reviews are outlined in **Part B** of this ACP and are detailed in separate supporting documents CL-4835-DOC-125 to 131 and the resulting revised airspace configuration is shown at **Appendix F**.

23.1.7. As a consequence of the revised airspace configuration, the need for LoAs with peripheral aerodromes has been reviewed and discussions are taking place, and will continue up to any CAS implementation to refine the access arrangements for aircraft operating to and from the small aerodromes within and in close proximity to the Southend CTR/CTA.

23.2. Manston

23.2.1. Discussions with ATC Manager Manston Airport have continued to endeavour to resolve concerns over the proximity of a segment of the proposed Southend CTA to IAPs to runway 10 at Manston. Meetings have taken place on 8 October 2013 and 17 March 2014, together with e-mail correspondence.

23.2.2. A number of adjustments to the eastern boundary of the Southend CTA have been considered. However, whilst the perceived impact on Manston operations has been reduced, consensus was not reached.

23.2.3. However, it has been identified that for the post-LAMP LTMA arrangements it is likely that the boundary in contention could be 'rolled back' to an alignment acceptable to Manston. The LAMP airspace development and discussions with NATS indicates that the outbound routing for LSA and LCY southbound SIDs, together with new link routes through the LTMA may not need to be as far to the east as originally required.

23.2.4. Consequently, having sight of the definitive Post-Sponsor Consultation airspace configuration, together with acceptance of the Post-LAMP potential 'roll-back' of the easterly extremity of the Southend CTA in contention, ATC Manager Manston Airport withdrew his objections to the Southend ACP on 30 April 2014.

23.2.5. The record of Meetings and e-mail correspondence with Manston is submitted separately as listed in **Appendix B.3.4.5**.

23.2.6. However, it was announced on 7 May 2014 that Manston Airport was to close on 15 May 2015. Nonetheless, details of the consultation with Manston have been retained in this ACP for completeness and for use should the closure be deferred or cancelled.

23.2.7. It should be noted that Kent County Council registered an objection to the LSA proposal in their response to the Sponsor Consultation because of concerns over the potential conflict with Manston operations. It was stated that if the Manston concerns were resolved then the objection would be withdrawn.

23.3. NATS

23.3.1. Discussions with NATS, both LTC Operations and the LAMP Development Team are ongoing to refine the ATC interface arrangements and LTMA route structures for both the pre- and post-LAMP airspace requirements. These discussions will continue through to the implementation of both airspace projects and beyond.

23.3.2. A meeting with NATS took place on 25 February 2014, together with e-mail correspondence on various aspects of the Post-Sponsor Consultation airspace development and Southend ATC participation in the LAMP Development Simulation in October 2013 and Validation Simulation in March 2014.

23.4. Peripheral Aerodromes

23.4.1. Discussions continue between LSA and the operators of various peripheral aerodromes to establish suitable access arrangements and co-ordination arrangements. These discussions are not yet complete due to the Post-Sponsor Consultation changes to the proposed configuration of the CTR/CTA.

23.4.2. Draft LoAs will be submitted at a later stage as necessary.

23.5. Other Meetings

23.5.1. In early February 2014, Meetings were held with Essex County Council and Kent County Council to clarify certain aspects of the airspace change and to discuss any issues they had with the proposals.

24. Conclusions

24.1. LSA has carried out a comprehensive Sponsor Consultation in accordance with the requirements of CAP725.

24.2. LSA has also maintained an active and on-going engagement with the CAA throughout the CAP725 process and the development of the definitive proposed airspace configuration. LSA has responded to changes to CAA Policy or the application of policy as the project has progressed.

24.3. LSA has maintained an active and on-going engagement with NATS and has responded to the announcement of the NATS LAMP project proposals after the commencement of this airspace change project. Similarly NATS has responded to the growth of CAT traffic at LSA and to the LSA airspace change project in the development of its plans for the LAMP Project. Accordingly, this ACP reflects a controlled airspace configuration which will be compatible with both the current and the post-LAMP arrangements in the eastern part of the London TMA.

24.4. LSA has maintained an active dialogue with Manager ATC Manston and consensus has been reached. This consensus also satisfies the objection of Kent County Council.

24.5. LSA continues discussions with a number of aerodrome operators in proximity to the proposed CTR/CTA to develop suitable access arrangements and LoAs. Draft LoAs will be submitted to the CAA SARG separately in due course.

24.6. LSA considers that all aspects of the process specified in CAP725 have been followed satisfactorily and that due regard has been taken of the concerns of the various elements of the aviation Industry and other interested parties.

24.7. LSA therefore submits this ACP for the re-introduction of Class D controlled airspace in the vicinity of LSA to ensure a safe operating environment for the increasing numbers of CAT flights operating to and from LSA in the critical stages of flight below the base levels of the overlying LTMA and for other aircraft operating in proximity to LSA.

24.8. A provisional timetable to implementation is given at **Appendix J** of this ACP.

PART F

APPENDICES

A. Glossary of terms

A.1. Organisational

Abbreviation	Meaning	Comment
ANSP	Air Navigation Service Provider	The organisation approved to provide air traffic management services. In some cases an Airport Operator provides the air traffic services itself (as at London Southend Airport) and in some cases the Airport Operator contracts a specialist ANSP company.
CAA	Civil Aviation Authority	The specialist UK aviation Regulator established by government to oversee all aspects of aviation activity in the UK.
DAP	Directorate of Airspace Policy	Prior to its merger with SRG on 1 July 2013, the DAP was the airspace approval and regulatory authority which conducted the planning of airspace and related arrangements in the UK. It ensured that the UK airspace was utilized in a safe and efficient manner. This was achieved through the development, approval and enforcement of policies for the effective allocation and use of UK airspace and its supporting infrastructure taking into account the needs of all stakeholders. These functions are now encompassed within the Safety and Airspace Regulation Group.
SARG	Safety and Airspace Regulation Group	The part of the CAA which oversees all aspects of air safety including the operation of aircraft and air traffic services. The SARG is responsible for the airspace arrangements in the UK. Note: Prior to July 2013 these functions were undertaken by separate Departments within the CAA, namely the Safety Regulation Group (SRG) and the Directorate of Airspace Policy (DAP)
ICAO	International Civil Aviation Organisation	An organisation established under the auspices of the United Nations through the Chicago Convention, charged with establishing Standards, Recommended Practices, Procedures for worldwide application.

Abbreviation	Meaning	Comment
NATS		Previously part of the CAA, NATS is an ANSP and was part privatised by the UK Government in 2001. NATS provides civil en route air navigation services in the UK under license from the Government and provides air navigation services at a number of airports under contract to the airport operators.
LAC	London Area Control Centre	NATS En Route Area Control Centre located at Swanwick, Hants, providing civil en route ATS over the southern part of the UK airspace and Terminal ATC services for the London TMA Airports.
LTC	London Terminal Control	That part of the LAC which provides the Terminal ATC services for the London TMA Airports.
SRG	Safety Regulation Group	Prior to is merger with DAP on 1 July 2013 to form SARG, the SRG was the part of the CAA which oversaw all aspects of air safety including the operation of aircraft and air traffic services.
SES	Single European Sky	A European Commission initiative with the objectives to restructure European airspace as a function of traffic flows rather than according to national boundaries, to create additional capacity and to increase the overall efficiency of the ATM System.
EUROCONTROL	European Organisation for the Safety of Air Navigation	The EUROCONTROL Mission is to harmonise and integrate air navigation services in Europe, aiming at the creation of a uniform ATM System for civil and military users in order to achieve a safe, secure, orderly expeditious and economic flow of traffic throughout Europe, whilst minimising adverse environmental impact.

A.2. Documents

Abbreviation	Meaning	Comment
AIC	Aeronautical Information Circular	Notices relating to safety, navigation, technical, administrative or legal matters

Abbreviation	Meaning	Comment
AIRAC	Aeronautical Information Regulation and Control	A system which ensures worldwide advanced notification, based on common effective dates, of circumstances that require significant changes to operating practices. (The AIRAC System is linked to the amendment of AIPs on a worldwide basis.)
ANO	Air Navigation Order 2009	Secondary Legislation of the UK which sets out the regulations for aviation in the UK.
Ann.	Annex	ICAO documents (Annexes to the Chicago Convention) which detail the Standards and Recommended Practices (SARPS) to be applied by States worldwide. e.g. Annex 2 Rules of the Air Annex 6 Operation of Aircraft Annex 11 Air Traffic Services Annex 15 Aeronautical Information
CAP	Civil Aviation Publication	The UK CAA publishes Regulatory, Guidance and Information material in the form of CAPs.
CAP 724	The Airspace Charter	A document published by the CAA authorities, responsibilities and principles by which the CAA DAP, as the airspace approval and regulatory authority conducts the planning of airspace and related arrangements in the UK.
CAP 725	CAA Guidance on the Application of the Airspace Change Process	A document published by the DAP which details the procedure by which a proposal to modify airspace dimensions, classification or usage in the UK can be put forward to DAP for approval. The process to be followed by sponsors of airspace change enables the CAA to meet its statutory duties established under the Transport Act 2000.
MATS Part 1	Manual of Air Traffic Services Part 1	The UK document published by the CAA (CAP 493) which contains instructions and procedures applicable to UK air traffic services at civil air traffic control units, and represents the UK interpretation and application of ICAO SARPs and PANS relevant to air traffic services.

Abbreviation	Meaning	Comment
MATS Part 2	Manual of Air Traffic Services Part 2	The document which contains the local instructions for each air traffic control unit and provides information which amplifies and interprets, at a local level, the instructions in MATS Part 1 and also details local separation standards to be applied where these differ from the national criteria because of specific local circumstances. The MATS Part 2 is subject to approval by the CAA as part of the Regulatory process.
PANS	Procedures for Air Navigation	ICAO documents which are the next level down from SARPS detailing procedures recommended for worldwide application. They specify in greater detail than the SARPS the actual procedures to be applied. e.g.: PANS-OPS Aircraft Operations PANS-ATM: Air Traffic Management
PANS-OPS	Procedures for Air Navigation Services - Aircraft Operations (ICAO Doc 8168)	Volume 2. Construction of Visual and Instrument Flight Procedures. A document published by the International Civil Aviation Organisation (ICAO) which specifies the criteria which are to be used on a world-wide basis for the design of Visual and Instrument Flight Procedures
UK AIP	UK Aeronautical Information Package	The State publication published by the CAA (CAP 32) to ICAO requirements detailing all of the aeronautical information and procedures applicable to civil aircraft operations in the UK. The UK AIP is a notifying document, which means that procedures notified within it have legal authority. Amendment of the UK AIP is in accordance with the AIRAC system.

A.3. Units of measurement

Abbreviation	Meaning	Comment
	Units of Measurement	Aviation uses a mixture of imperial and metric measurements. Whilst runway lengths are measured in metres, distances for navigation are measured in nautical miles (NM). 1NM is a distance of 6017.12ft, equivalent to 1.8520km. The standard unit for vertical measurement is feet (Ft).

Abbreviation	Meaning	Comment
aal	Above Aerodrome Level	The vertical displacement of an aircraft above aerodrome level is known as **Height**. The aircraft altimeter is set to the barometric pressure at the aerodrome (known as QFE).
amsl	Above mean sea level	The standard level reference for aircraft operations and airspace design below the Transition Altitude. The height of an aircraft measured above mean sea level is known as **Altitude** (ALT). The aircraft altimeter is set to the barometric pressure at the aerodrome, adjusted to take account of the aerodrome elevation (known as QNH).
FL	Flight Level	The height of an aircraft above a standard barometric pressure reference of 1013.25 Hectopascals and is the standard level reference for aircraft operations above the Transition Altitude.

A.4. Airspace and air traffic services

Abbreviation	Meaning	Description
ATS	Air Traffic Services	A generic term meaning variously, flight information service, alerting service, air traffic advisory service, air traffic control service (area control service, approach control service or aerodrome control service). (ICAO)
ATC	Air Traffic Control	A service provided for the purpose of preventing collisions between aircraft, and, on the manoeuvring area, between aircraft and obstructions, and expediting and maintaining an orderly flow of air traffic;
	Classification of Airspace	The ICAO system of classifying airspace by letter indicating the level of Air Traffic Service provided in the airspace and the meteorological criteria for VFR flight. Classes A to E are Controlled Airspace; Classes F & G are uncontrolled airspace. Class A airspace requires the mandatory operation of all flights according to the Instrument Flight Rules, Classes B, C, D and E controlled airspace permit VFR operations with differing levels of ATM compliance and application of separation by ATC.

Abbreviation	Meaning	Description
	Class A Airspace	Controlled airspace in which the operation of flights according to the IFR is mandatory and in which ATC provides separation between all flights (including Special VFR flights).
	Class C Airspace	Controlled airspace in which both IFR and VFR flights are permitted and in which ATC provides separation between IFR flights (including Special VFR flights) and between IFR flights and VFR flights and provides adequate management of VFR flights to permit the effective integration of traffic and collision avoidance. Throughout the EU airspace, all airspace from FL195 to FL660 is designated as Class C airspace but stringent access rules preclude the routine operation of VFR flights. In the UK, some portions of Airways are also designated as Class C Airspace.
	Class D Airspace	Controlled airspace in which both VFR and IFR flights are permitted and in which ATC provides separation between IFR flights (including Special VFR flights) and provides adequate management of VFR flights to permit effective integration of traffic and collision avoidance. In the UK, Class D airspace is the normal classification used for controlled airspace in the vicinity of aerodromes. Some Airway segments are also designated as Class D airspace.
	Class E airspace	Controlled airspace in which both VFR and IFR flights are permitted and air traffic service is only mandatory for IFR flights. VFR flights may operate without reference to ATC. The use of Class E airspace for Control Zones is not permitted.
	Class G Airspace	Uncontrolled airspace in which aircraft may operate freely, under VFR or IFR, without reference to any ATS Unit.
	Radar Vectoring	Provision of navigational guidance to aircraft in the form of specified headings based on the use of radar.

Abbreviation	Meaning	Description
ATSOCAS	Air Traffic Services Outside Controlled Airspace	A menu of Air Traffic Services specified in CAP774 which are available, on request, to VFR or IFR flights operating in Class G airspace. The services comprise Basic Service, Traffic Service, Deconfliction Service and Procedural Service.
	Basic Service	An ATS in which advice and information useful for the safe and efficient conduct of flight is provided. It may include weather information, serviceability of facilities, conditions at aerodromes, general airspace activity information and any other information likely to affect safety. The avoidance of other traffic is solely the pilot's responsibility and relies on the pilot avoiding other traffic unaided by controllers. The provider of the service is not required to monitor flights.
	Traffic Service	A surveillance based ATS, where, in addition to the provisions of a Basic Service, the controller provides specific surveillance-derived traffic information to assist the pilot in avoiding other traffic. Controllers may provide headings and/or levels for the purposes of positioning and/or sequencing; however, the controller is not required to achieve deconfliction minima, and the avoidance of other traffic is ultimately the pilot's responsibility
	Deconfliction Service	A surveillance based ATS where, in addition to the provisions of a Basic Service, the controller provides specific surveillance-derived traffic information and issues headings and/or levels aimed at achieving planned deconfliction minima, or for positioning and/or sequencing. However, the avoidance of other traffic is ultimately the pilot's responsibility.

Abbreviation	Meaning	Description
	Procedural Service	An ATS where, in addition to the provisions of a Basic Service, the controller provides restrictions, instructions, and approach clearances, which if complied with, shall achieve deconfliction minima against other aircraft participating in the Procedural Service. Neither traffic information nor deconfliction advice can be passed with respect to unknown traffic. A Procedural Service does not require information derived from an ATS surveillance system.
ATM	Air Transport Movement	Landings or take offs by aircraft engaged on the transport of passengers, cargo or mail on commercial terms. All scheduled movements, including those operated empty, loaded charter and air taxi movements are included.
ATZ	Aerodrome Traffic Zone	Airspace of defined dimensions established around an aerodrome for the protection of aerodrome traffic.
CTA	Control Area	A controlled airspace extending upwards from a specified limit above the surface to a specified upper limit.
CTR	Control Zone	A controlled airspace extending upwards from the surface to a specified upper limit.
IAP	Instrument Approach Procedure	A series of predetermined manoeuvres by reference to flight instruments with specified protection from obstacles from the initial approach fix, or where applicable, from the beginning of a defined arrival route to a point from which a landing can be completed and thereafter, if a landing is not completed, to a position at which holding or en route obstacle clearance criteria apply.
IFR	Instrument Flight Rules	Rules 32 to 37 of the Rules of the Air Regulations which specify certain rules to be complied with (including Minimum Height Rules, level convention rules, flight planning, and ATC clearance rules and position reporting requirements). A pilot must be suitably qualified and the aircraft appropriately equipped in order to operate under the IFR.
IMC	Instrument Meteorological Conditions	Meteorological conditions expressed in terms of visibility, distance from cloud and ceiling, which preclude flight under the Visual Flight Rules.

Abbreviation	Meaning	Description
RMZ	Radio Mandatory Zone	An airspace of defined dimensions wherein the carriage and operation of suitable/appropriate radio equipment is mandatory. (EU IR 923/2012). Before entering an RMZ a pilot must make an initial call to the designated radio station giving the aircraft callsign, type, position, level, intentions and any other information prescribed by the competent authority. Whilst operating within an RMZ VFR flights in Class E, F or G airspace and IFR flights in Class F or G airspace shall maintain a continuous communication watch on the appropriate communications channel unless operating in compliance with alternative provisions for that particular airspace prescribed by the Controlling Authority.
Special VFR		A flight made in a Control Zone under conditions which would normally require compliance with the Instrument Flight Rules but which is made in accordance with special instructions issued by the ATC Unit instead of in accordance with the Instrument Flight Rules and in which the aircraft must remain clear of cloud and in sight of the surface.
TMA	Terminal Control Area	A Control Area normally established at the confluence of a number of ATS Routes in the vicinity of one or more major aerodromes.
TMA	Transponder Mandatory Airspace	An airspace of defined dimensions within which the carriage and operation of SSR transponder equipment is mandatory. SSR transponder equipment shall comprise Mode A and C functionality together with Mode S Elementary Surveillance functionality. Access to a Transponder Mandatory Airspace without the prescribed equipment may be granted subject to specific ATC approval.
VFR	Visual Flight Rules	Rules 25 to 30 of the Rules of the Air Regulations 2007

Abbreviation	Meaning	Description
VMC	Visual Meteorological Conditions	Meteorological conditions expressed in terms of visibility, distance from cloud which permit flight under the Visual Flight Rules. In the UK the VMC minima for VFR operations in various classifications of airspace are laid down in Rule 27 of the Rules of the Air Regulations 2009 and different minimum flight visibility, distance from cloud and ceiling minima are specified between controlled and uncontrolled airspace.
VRP	Visual Reference Point	A point established in the vicinity of an aerodrome located within controlled airspace to facilitate access to and from aerodromes located within, and transit of the controlled airspace by VFR traffic. VRPs are located at prominent natural or man-made ground features which are readily identifiable from the air.

A.5. Infrastructure

Abbreviation	Meaning	Description
DME	Distance Measuring Equipment	A navigational facility which provides information to an aircraft indicating its distance from the facility. DME may be installed in conjunction with an en route, terminal or approach navigational facility.
GNSS	Global Navigation Satellite System	A navigation infrastructure using satellite based navigation data.
GPS	Global Positioning System	A GNSS provided by the US Department of Defence and available for public use.
ILS	Instrument Landing System	A precision instrument approach navigation aid which provides lateral and vertical track guidance to aircraft along the final approach track and distance information.
NDB	Non Directional Beacon	An MF en route and/or terminal and approach navigational facility from which the pilot can determine the bearing of the facility with reference to his own position.

Abbreviation	Meaning	Description
NDB(L)	Locator NDB	An NDB provided for use as an approach aid, during the notified hours of ATS, at aerodromes for which instrument approach procedures are published.
PSR	Primary Surveillance Radar	A surveillance radar system which uses reflected radio signals.
RNAV	Area Navigation	A method of navigation which permits aircraft operation on any desired flight path within the coverage of station referenced navigation aids or within the limits of the capability of self-contained aids, or a combination of these.
SSR	Secondary Surveillance Radar	A system of radar using ground interrogators and airborne transponders to determine the position of an aircraft in range and azimuth and, when agreed modes and codes are used, height and identity as well.
SSR Mode C		That element of the SSR System which provides information which indicates the height of the aircraft.
SSR Mode S	Mode Select	Modern transponder systems include Elementary Surveillance or Enhanced Surveillance capabilities and provide greater functionality than earlier generations of transponder systems including, inter alia, interactive ACAS Resolution Advisory. Mode S Elementary is the basic level of transponder carriage notified, as appropriate, in UK airspace. Enhanced Surveillance includes additional functionality and is mandated in certain specified controlled airspace.

B. List of supporting documents submitted separately

B.1. Framework Briefing:

B.1.1.	LSA ACP Framework Document	CL-4835-ACP-12
B.1.2.	Minutes of the Framework Briefing Meeting 27 Feb 2013	CL-4835-MIN-54

B.2. Focus Group Stage:

B.2.1. Notes of Focus Group Meetings:

B.2.1.1.	Airport-based Focus Group (FG1)	CL-4835-DOC-63
B.2.1.2.	Local Non-Aviation Interests (FG2)	CL-4835-DOC-64
B.2.1.3.	Off-Airport Airspace Users (FG3)	CL-4835-DOC-65
B.2.1.4.	ATS Focus Group (FG4)	CL-4835-DOC-66

B.2.2. Post Focus Group Reviews

B.2.2.1.	Southern CTR Boundary	CL-4835-DOC-67
B.2.2.2.	Offshore Holding Area	CL-4835-DOC-68
B.2.2.3.	Hanningfield Box	CL-4835-DOC-69
B.2.2.4.	Upper Limits	CL-4835-DOC-73
B.2.2.5.	Focus Group Stage Report	CL-4835-DOC-71
B.2.2.6.	End of Focus Group Stage Meeting Note	

B.3. Consultation Stage:

B.3.1.	Sponsor Consultation Document	CL-4835-DOC-102
B.3.2.	Consultee Response Spreadsheet	CL-4835-DOC-50

B.3.3. Consultation Meeting Notes

B.3.3.1.	BGA/Herts & Essex GC/Challock (20/11/2013)	CL-4835-DOC-152
B.3.3.2.	BBAC (22/11/2013)	CL-4835-DOC-153
B.3.3.3.	Chelmsford CC & Minster-on-Sea PC (27/11/2013)	CL-4835-DOC-156

B.3.3.4.	Stapleford Flight Centre (28/11/2013)	CL-4835-DOC-155
B.3.3.5.	Medway Council (04/12/2013)	CL-4835-DOC-154

B.3.4. Responses from Consultees and follow-up correspondence

B.3.4.1.	Responses from Consultees and follow-up correspondence	E-mail files
B.3.4.2.	Responses from other interested individuals and organisations and follow-up correspondence	E-mail files
B.3.4.3.	Analysis of Responses from Consultees	CL-4835-DOC-141
B.3.4.4.	Analysis of submissions from other interested parties	CL-4835-DOC-142
B.3.4.5.	Meetings & Correspondence with Manston Airport	CL-4835-DOC-150
B.3.4.6.	Meetings & Correspondence with NATS (including simulation participation)	CL-4835-MIN-032 *et seq*
B.3.4.7.	Consultation Report	CL-4835-RPT-160
B.3.4.8.	End of Consultation Stage Meeting Note (20 Jan 2014)	CL-4835-Min-140

B.4. Post-Consultation Stage:

B.4.1. Post-Consultation Airspace Configuration Review

B.4.1.1.	Part 1 – Overview	CL-4835-DOC-125
B.4.1.2.	Part 2 – Southwest Sector	CL-4835-DOC-126
B.4.1.3.	Part 3 - South Sector	CL-4835-DOC-127
B.4.1.4.	Part 4 – Northeast Sector	CL-4835-DOC-128
B.4.1.5.	Part 5 – Holding Area	CL-4835-DOC-129
B.4.1.6.	Part 6 – Hanningfield	CL-4835-DOC-130
B.4.1.7.	Part 7 – Summary & Safety Management	CL-4835-DOC-131
B.4.1.8.	Post-Consultation discussions with Manston	CL-4835-DOC-151
B.4.1.9.	Post-Consultation discussions with NATS.	Ongoing

B.5. Letters of Agreement: (To be submitted separately)

B.5.1. Draft LoA with Stoke Microlight Aerodrome

B.5.2. Draft LoA with St Lawrence

B.5.3. Draft LoA with Tillingham

B.5.4. Draft LoA with Barling

B.5.5. Draft LoA with Burnham

B.5.6. Draft LoA with Canewdon

B.5.7. Draft LoA with Stow Maries

B.5.8. Draft LoA with Balloon Operators

B.6. Miscellaneous

B.6.1.	Southend Signal in Space Coverage Report	CL-4835 -RPT-013
B.6.2.	DME Coverage Report 30 October 2012	CL-4835-RPT-014
B.6.3.	Note of informal meeting with easyJet 15 Jan 2013	CL-4835-MIN-40
B.6.4.	Note of informal meeting with QinetiQ 15 Jan 2013	CL-4835-MIN-39
B.6.5.	LSA ATC Class G Events Log Issue 1 2012 – April 2014	CL-4835-DOC-138
B.6.6.	LSA Release Delays Log Nov 2013 – April 2014	CL-4835-DOC-139

C. Summary of AIRPROX Incidents

C.1. This Appendix gives a brief synopsis of the three AIRPROX incidents involving CAT flights inbound to LSA since 2011. Amplifying LSA comments pertinent to this ACP are given as appropriate. Full details of the UKAB investigation and Report of each AIRPROX can be found in the UKAB Report documents at http://www.airproxboard.org.uk

C.2. AIRPROX 2012–056

C.2.1. Date: 6 October 2012

C.2.2. Aircraft involved: ATR42 inbound to LSA runway 06; A109 helicopter inbound to Luton Airport via Isle of Grain and Thurrock.

C.2.3. Location: 8NM southwest of LSA close to final approach track, 1500ft ALT

C.2.4. ATS: procedural service - Primary Radar out of service

C.2.5. The ATR42 was carrying out a procedural NDB to ILS approach from the SND NDB (AD2-EGMC-8-1). Although the LSA primary radar was out of service and the controller was providing a procedural (non-radar) approach control service from the VCR, radar data from the Debden feed, comprising SSR was displayed on the Aerodrome Traffic Monitor (ATM). (Provision of a radar-based ATS using SSR alone is not approved.) Notwithstanding, the controller passed limited traffic information as best he could from the SSR data on the ATM and, with the conflicting aircraft carrying a London FIS squawk, he attempted to get transfer of the traffic to his frequency. However, the conflicting traffic had been transferred to Farnborough LARS and had not yet established contact with them. In the base turn towards the ILS localiser the ATR pilots observed two aircraft in close proximity, one of them a helicopter. Having sighted the helicopter a TCAS RA was triggered, which the ATR pilots followed in a descending turn as commanded. The second aircraft sighed was a microlight, also in close proximity to the ATR42. No PSR data of non-transponding aircraft was showing on the ATM display. (Subsequent post-incident analysis of London area radar composite recordings by CAA ATSI indicated two non-transponding targets in the area as well as the ATR42 and the A109, although they did not show on the Debden PSR.)

C.2.6. UKAB classified this as a CAT A AIRPROX with a definite risk of collision. The UKAB commended the LSA controller who, although not radar qualified and without approval to use the ATM to provide radar-derived service, used his best endeavours to resolve the conflict by making best use of the limited information available to him.

C.2.7. LSA considers that if the A109 had contacted LSA ATC instead of London FIS when crossing the River Thames in proximity to LSA arrival and departure traffic flows, the incident would not have taken place. Similarly, the two non-communicating, non-transponding intermittent PSR responses (believed to be microlights, one of them observed by the

ATR42 pilots) would have been 'known traffic' if Class D controlled airspace had been in place.

C.3. AIRPROX 2013-029

C.3.1. Date: 1 May 2013

C.3.2. Aircraft involved: A319 inbound to LSA runway 06 from the south; RV6 outbound from Thurrock tracking 136°M (towards LSA runway 06 approach track)

C.3.3. Location: 8.2NM southwest of LSA close to runway 06 Final Approach track, below 3000ft ALT.

C.3.4. ATS: A319: between transfer between Thames Radar and LSA Radar; Avoiding Action passed on first contact with LSA. RV6: communicating with London FOS to activate Flight Plan.

C.3.5. The radar handover (including vector towards runway 06 approach from the south and transfer level) of the A319 had been coordinated between Thames Radar and Southend Radar but the transfer of communications was delayed by workload on the Thames Radar sector. The RV6 'popped up' (unknown traffic) and was observed by the Southend Radar controller wearing a London FIS squawk (although at that time it was not actually in contact with London FIS) and in conflict with his plan of action for the A319. He contacted London FIS to get them to transfer the unknown traffic to him but the aircraft had not yet contacted London FIS. He therefore endeavoured, unsuccessfully at first, to contact Thames Radar and also made blind transmissions to both the A319 and the unknown traffic to resolve the conflict. The A319 eventually came on frequency late and high for the turn onto runway 06 approach and avoiding action was given against the unknown traffic. The RV6 then came on frequency with the A319 in sight and thus, although the separation was less than that which LSA ATC was required to provide under a Deconfliction Service, the conflict was resolved.

C.3.6. The UKAB classified this as a CAT C AIRPROX with no risk of collision as the RV6 had visual contact with the A319, albeit that the separation was less than that which the LSA controller had to endeavour to provide.

C.3.7. A number of factors of concern contributed to this AIRPROX. First was the late transfer of communication of the A319 from Thames Radar to Southend Radar. Had the transfer taken place as expected and as normal, then the incident could have been resolved much earlier. Secondly, the RV6 pilot placed his priority on activating his flight plan with London Information rather than contacting Southend Radar when operating in an area where it was known that instrument approaches to LSA runway 06 took place. Furthermore, by wearing a London FIS conspicuity squawk before contacting London FIS he provided misleading information to the Southend Radar controller which the controller used, in the first instance, to try and resolve the conflict. Had the pilot contacted Southend Radar in the first instance then the conflict would have been resolved before it developed. Had

Class D controlled airspace been in place to protect the vicinity of the runway 06 approach path then the incident would not have taken place.

C.4. AIRPROX 2013-082

C.4.1. Date: 17 July 2013

C.4.2. Aircraft involved: A319 inbound to LSA runway 06 from the south; untraced paramotor aircraft.

C.4.3. Location: 8NM south-southwest of LSA on base leg / closing heading to runway 06 ILS at 2000ft ALT.

C.4.4. ATS: ATSOCAS Deconfliction Service; Vectoring to ILS runway 06

C.4.5. When approximately 8NM from LSA on radar vectored base leg to runway 06 ILS the A319 passed a red paramotor aircraft on their left hand side about 50m away at the same altitude. There was no time to take avoiding action. The paramotor aircraft did not indicate on LSA Radar at any time and was not traced.

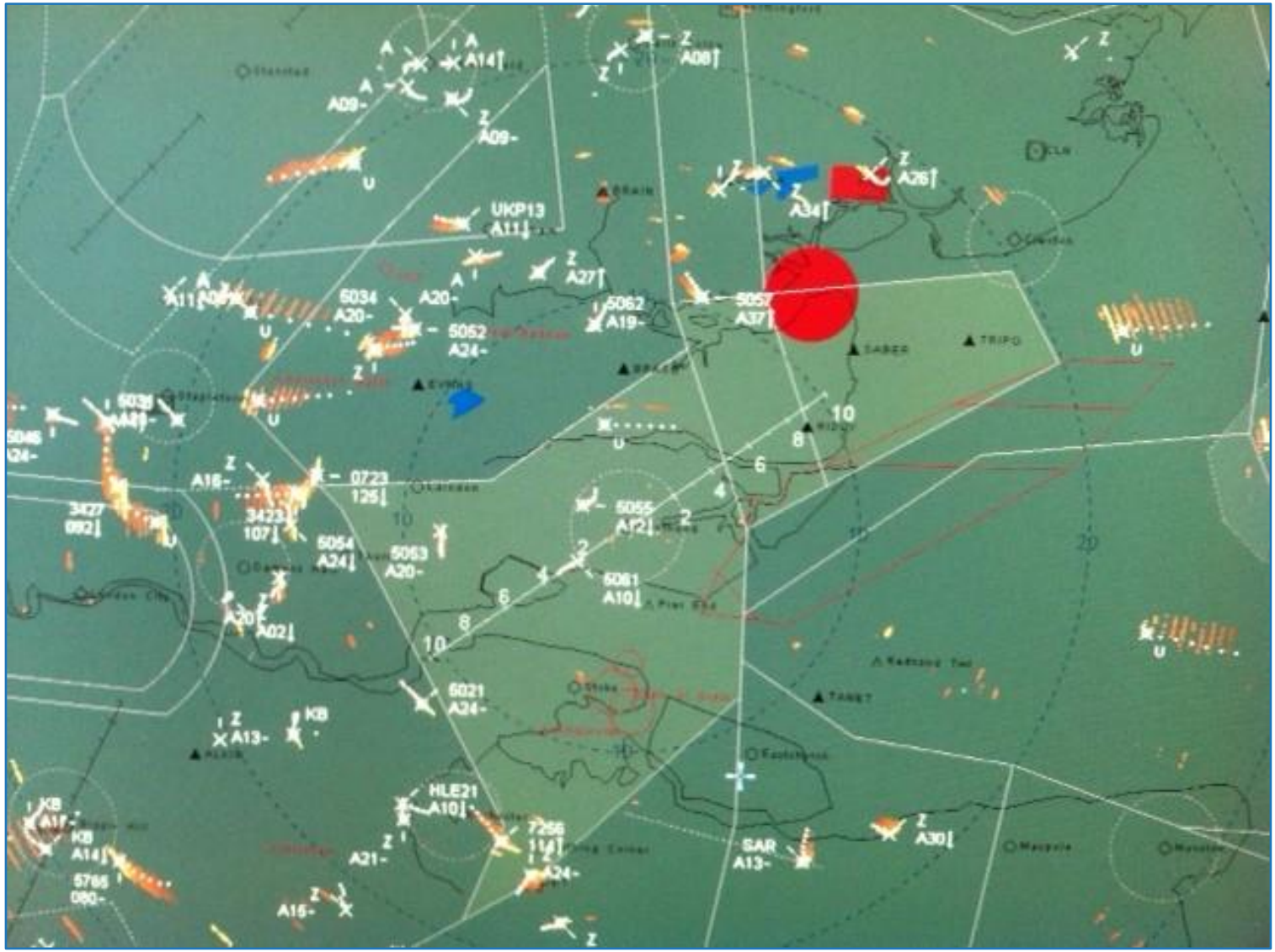
C.4.6. The UKAB classified this as a CAT A AIRPROX with a high risk of collision and recommended that the CAA review the regulation and licencing of paramotor pilots.

C.4.7. LSA notes that the AIRPROX took place in the vicinity of Halstow Marshes and St Mary's Marsh VRP on the Isle of Grain, which is an area popular with glider, hang-glider, microlight and other GA pilots both for general handling and when crossing the River Thames. If Class D controlled airspace was in place then the location of the incident would have been within the Southend CTR or adjoining CTA and, unless the paramotor pilot infringed controlled airspace the incident would not have taken place.

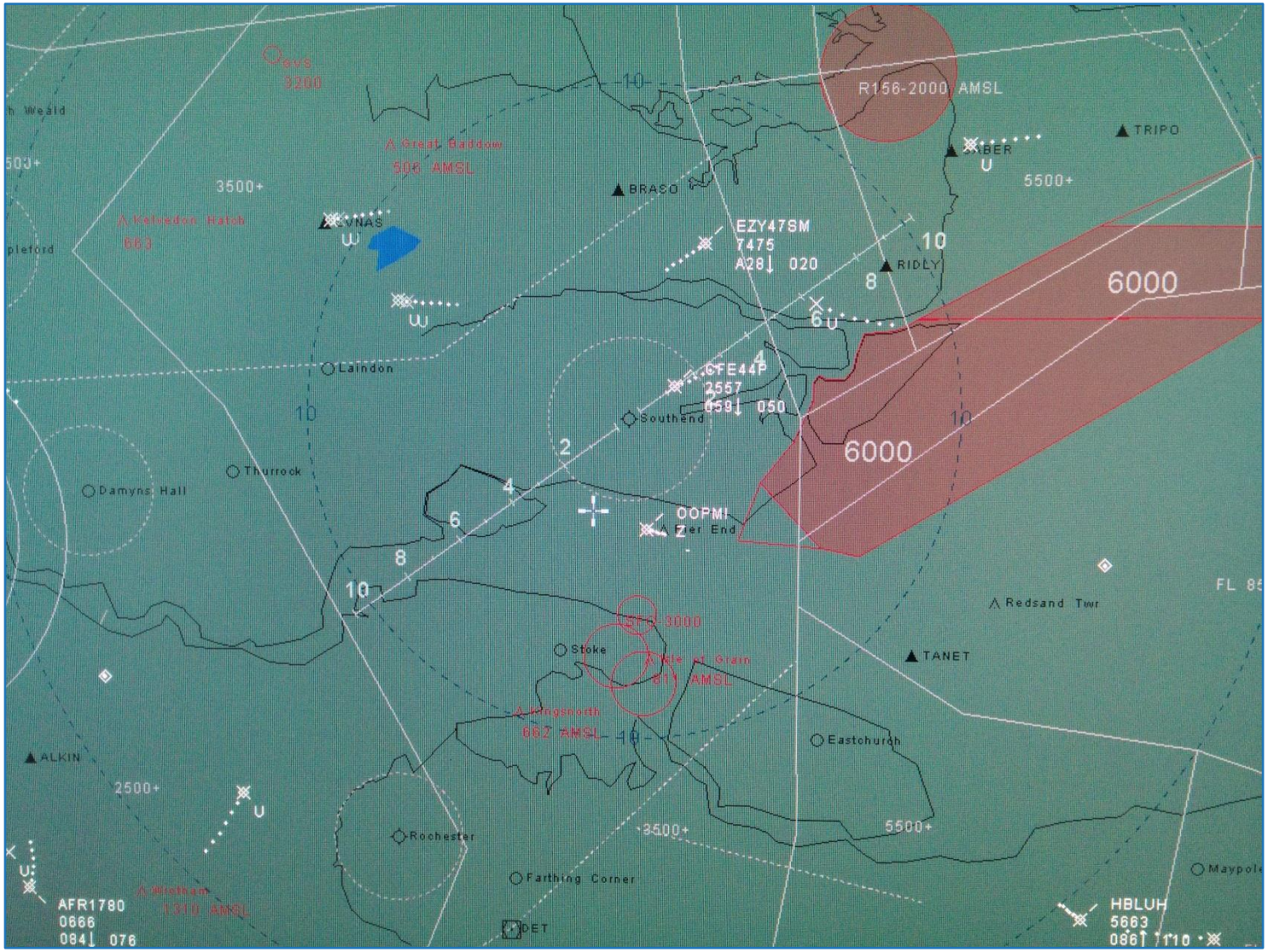
D. Exemplar screen shots of routine traffic situations

D.1. Hanningfield GA and S&R Operations Area – Circa 3 Apr 13.

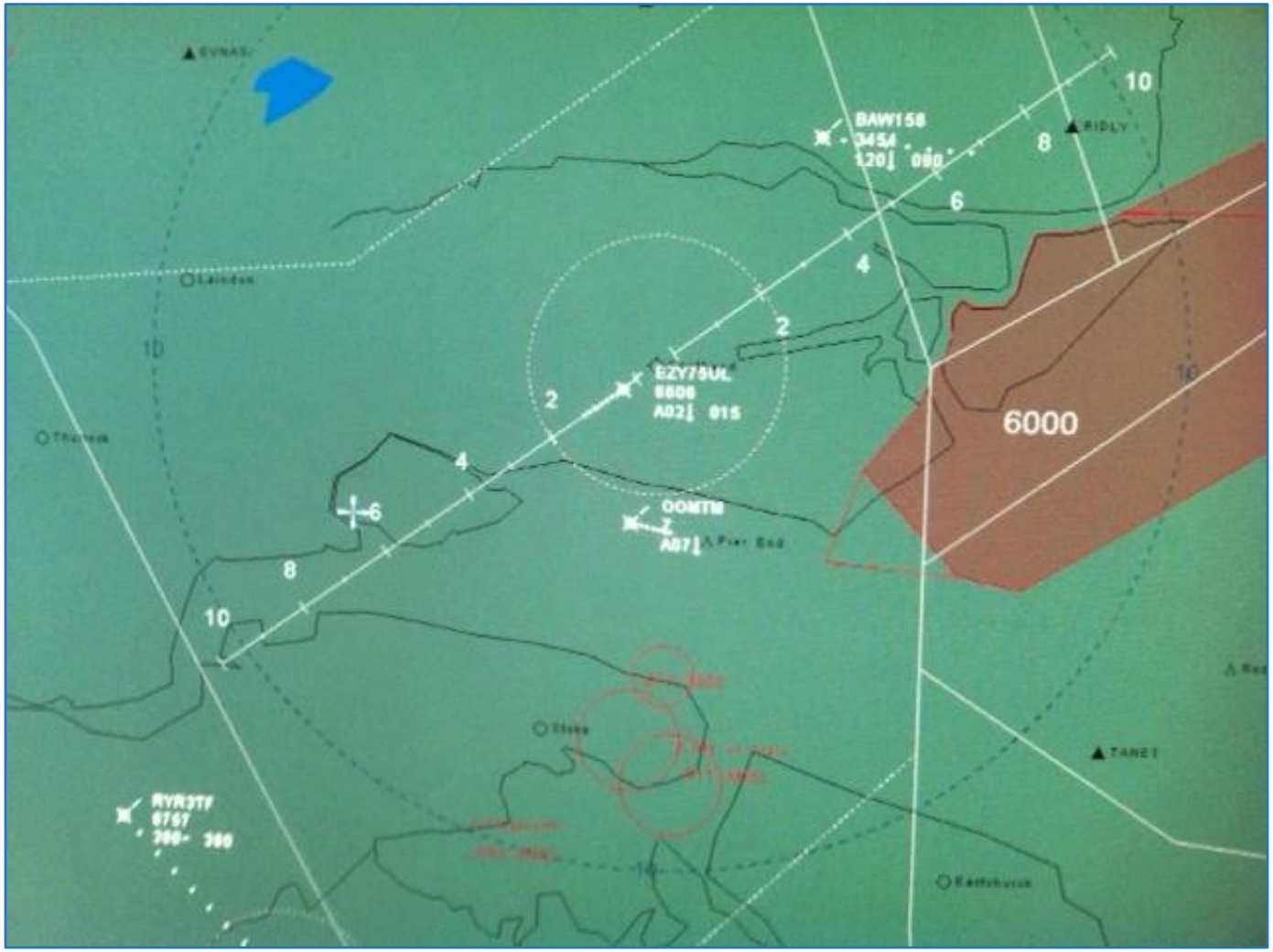
D.2. ATS Environment - Sat 20 Apr 13 1130z.



D.3. Non-communicating traffic crossing runway centreline adjacent to ATZ - No Altitude information – Circa 12 Dec 13

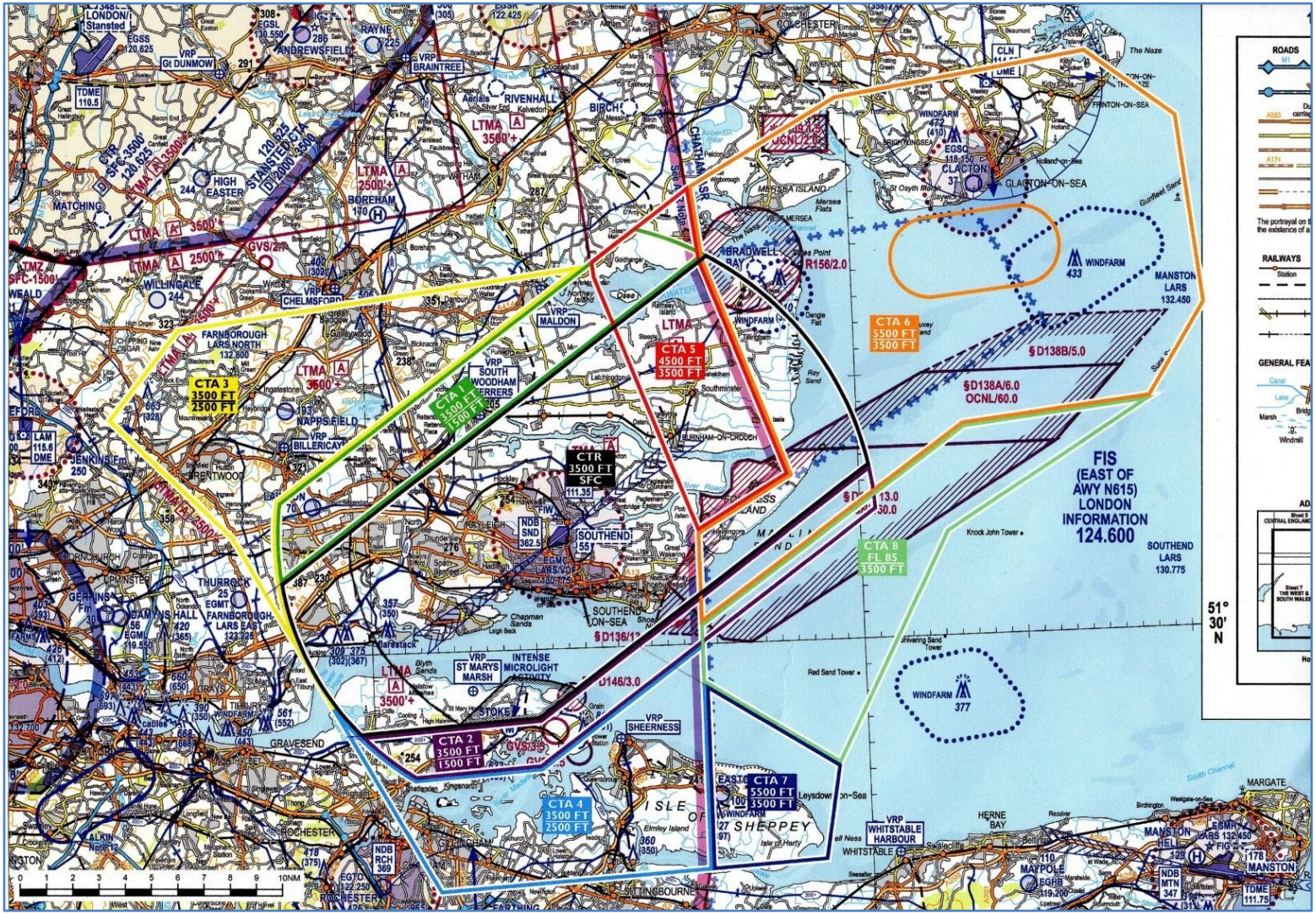


D.4. Non-communicating traffic crossing runway centreline adjacent to ATZ - 2 Oct 13[25]



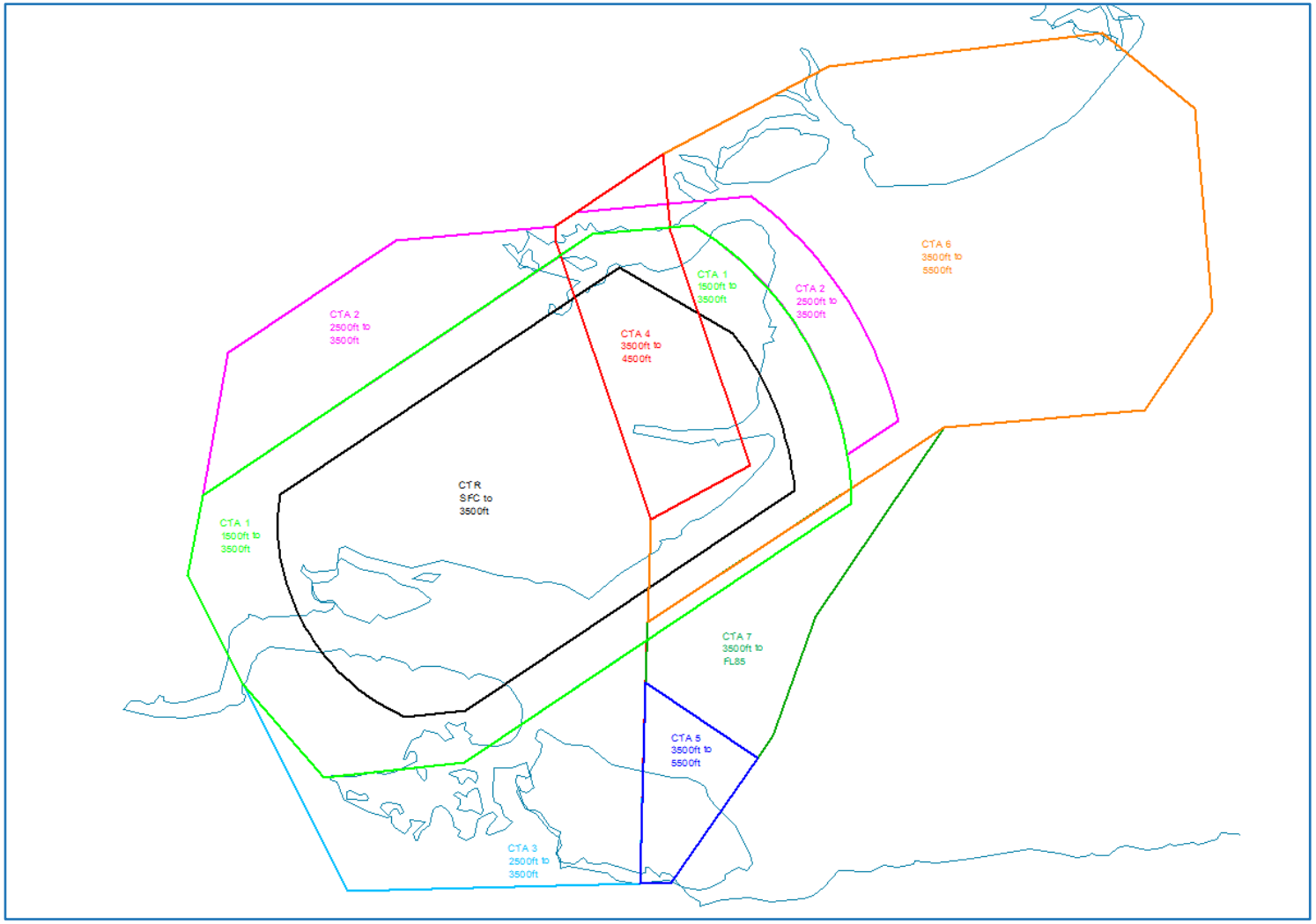
[25] EZY75UL inbound ILS 06 advised of the 'z' unknown traffic observed passing Sheerness. Traffic monitored and passed and EZY issued landing clearance on the Radar frequency in case of need to break off approach due to the unknown. The traffic passed behind

E. Proposed airspace configuration submitted to consultation



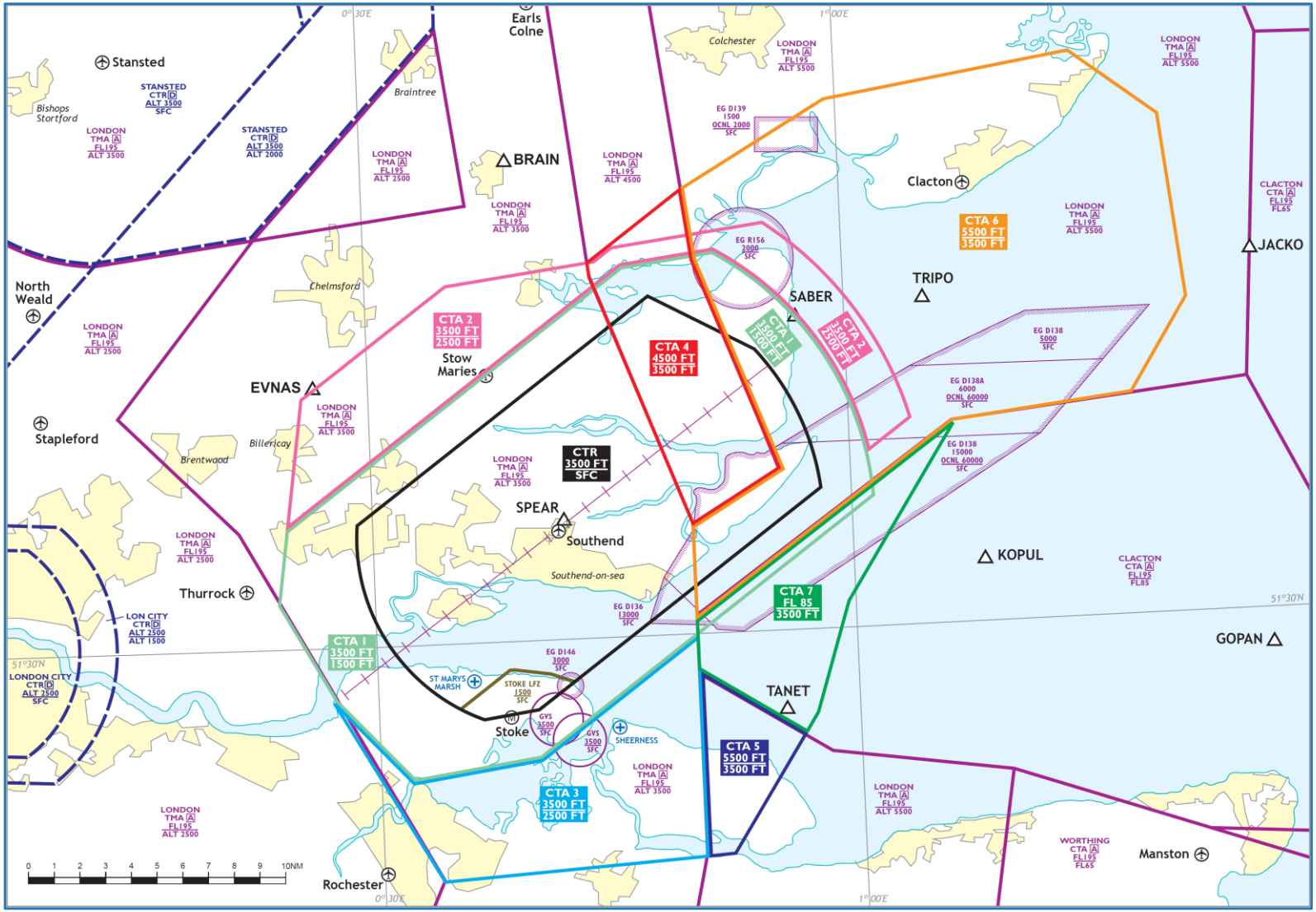
F. LSA Airspace Change Proposal: Proposed Controlled Airspace

F.1. Proposed CAS overlaid –Outline diagram.



F.2. Proposed CAS overlaid on 1:500 000 Aeronautical Chart.

F.3. Proposed CAS overlaid with geographic background.



G. Proposed Southend CTR/CTA Coordinates

G.1. This Appendix details the WGS-84 coordinates of the proposed Southend CTR and CTA segments depicted at **Appendix F** and as described in **Section 8** of the ACP.

G.2. Southend Control Zone

G.2.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 34' 45.0732" N	0° 29' 2.7602" E
	51° 43' 11.5212" N	0° 47' 48.1756" E
	51° 40' 56.9820" N	0° 54' 19.6390" E
then by arc of a circle radius 10NM (18520m) centred on the runway 24 threshold: to	51° 34' 27.7104" N	0° 42' 7.4712" E
	51° 35' 27.7404" N	0° 58' 4.6255" E
	51° 27' 18.6516" N	0° 39' 55.1293" E
	51° 27' 0.6588" N	0° 36' 29.8230" E
then by arc of a circle radius 7.5NM (13890m) centred on the runway 24 threshold: to	51° 33' 57.327" N	0° 40' 59.963" E
	51° 34' 45.0732" N	0° 29' 2.7602" E

G.2.2. Class D Controlled Airspace; Surface to 3500ft amsl.

G.3. Southend Control Area – 1

G.3.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 34' 37.2540" N	0° 24' 40.2177" E
	51° 44' 20.0760" N	0° 46' 13.7835" E
	51° 44' 46.1940" N	0° 51' 57.5681" E
then by arc of a circle radius 12NM (22224m) centred on the runway 24 threshold: to	51° 34' 27.7104" N	0° 42' 7.4712" E
	51° 35' 4.1964" N	1° 1' 20.3006" E
	51° 25' 27.7500" N	0° 39' 55.8747" E
	51° 24' 46.0764" N	0° 32' 2.3353" E
	51° 27' 57.4272" N	0° 27' 21.0386" E
	51° 31' 45.7284" N	0° 24' 0.6164" E
	51° 34' 37.2540" N	0° 24' 40.2177" E

G.3.2. Class D controlled airspace: 1500ft amsl to 3500ft amsl.

G.4. Southend Control Area – 2

G.4.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 34' 37.2540" N	0° 24' 40.2177" E
	51° 44' 20.0760" N	0° 46' 13.7835" E
	51° 44' 46.1940" N	0° 51' 57.5681" E
then by arc of a circle radius 12NM (22224m) centred on the runway 24 threshold: to	51° 34' 27.7104" N	0° 42' 7.4712" E

Position	Latitude	Longitude
	51° 36' 46.1808" N	1° 1' 0.5412" E
	51° 38' 1.7484" N	1° 3' 50.3338" E
then by arc of a circle radius 14NM (25928m) centred on the runway 24 threshold: to	51° 34' 27.7104" N	0° 42' 7.4712" E
	51° 45' 51.0336" N	0° 55' 10.4635" E
	51° 45' 5.8392" N	0° 45' 14.3663" E
	51° 44' 35.0160" N	0° 44' 5.5207" E
	51° 43' 53.3892" N	0° 35' 7.5706" E
	51° 39' 42.7500" N	0° 25' 50.9428" E
	51° 34' 37.2540" N	0° 24' 40.2177" E

G.4.2. Class D controlled airspace: 2500ft amsl to 3500ft amsl.

G.5. Southend Control Area – 3

G.5.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 27' 57.4272" N	0° 27' 21.0386" E
	51° 24' 46.0764" N	0° 32' 02.3354" E
	51° 25' 27.7500" N	0° 39' 55.8748" E
	51° 29' 59.8668" N	0° 50' 0.0114" E
	51° 21' 20.00" N	0° 50' 0.0000" E
	51° 20' 45.9996" N	0° 33' 38.0000" E
	51° 27' 57.4272" N	0° 27' 21.0386" E

G.5.2. Class D controlled airspace: 2500ft amsl to 3500ft amsl.

G.6. Southend Control Area – 4

G.6.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 34' 17.0000" N	0° 50' 0.0000" E
	51° 44' 0.9957" N	0° 44' 11.7745" E
	51° 44' 35.0164" N	0° 44' 5.5207" E
	51° 47' 15.8611" N	0° 50' 5.3409" E
	51° 44' 31.0000" N	0° 50' 38.0000" E
	51° 36' 18.0000" N	0° 55' 32.0000" E
	51° 34' 17.0000" N	0° 50' 0.0000" E

G.6.2. Class D controlled airspace: 3500ft amsl to 4500ft amsl.

G.7. Southend Control Area – 5

G.7.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 28' 28.9632" N	0° 50' 0.0850" E
	51° 25' 54.5592" N	0° 56' 25.1176" E
	51° 21' 24.0588" N	0° 51' 43.6208" E
	51° 21' 20.0000" N	0° 50' 0.0000" E
	51° 28' 28.9632" N	0° 50' 0.0850" E

G.7.2. Class D controlled airspace: 3500ft amsl to 5500ft amsl.

G.8. Southend Control Area – 6

G.8.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 30' 38.0040" N	0° 50' 0.0090" E
	51° 34' 17.0000" N	0° 50' 0.0000" E
	51° 36' 18.0000" N	0° 55' 32.0000" E
	51° 44' 31.0000" N	0° 50' 38.0000" E
	51° 47' 15.8611" N	0° 50' 5.3409" E
	51° 50' 32.1355" N	0° 59' 22.2989" E
	51° 51' 57.6774" N	1° 14' 49.6278" E
	51° 49' 21.3813" N	1° 20' 13.7861" E
	51° 42' 12.1410" N	1° 21' 26.6835" E
	51° 38' 36.4005" N	1° 17' 44.4866" E
	51° 37' 51.0000" N	1° 06' 27.0000" E
	51° 30' 38.0040" N	0° 50' 0.0090" E

G.8.2. Class D controlled airspace: 3500ft amsl to 5500ft amsl.

G.9. Southend Control Area – 7

G.9.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 30' 37.9980" N	0° 50' 0.0090" E
	51° 37' 50.9988" N	1° 06' 27.0000" E
	51° 31' 0.5268" N	0° 59' 30.2560" E
	51° 26' 44.5452" N	0° 57' 16.5436" E
	51° 25' 54.5592" N	0° 56' 25.1175" E
	51° 28' 28.9992" N	0° 50' 0.0000" E
	51° 30' 37.9980" N	0° 50' 0.0090" E

G.9.2. Class D controlled airspace: 3500ft amsl to FL 085.

G.10. Stoke Aerodrome – LFZ

G.10.1. The airspace bounded by the following points:

Position	Latitude	Longitude
Start	51° 27' 27.4212" N	0° 35' 1.6000" E
	51° 28' 53.4468" N	0° 38' 11.8750" E
	51° 28' 53.8068" N	0° 38' 29.4708" E
	51° 28' 40.8108" N	0° 40' 44.2613" E
	51° 28' 20.4312" N	0° 42' 12.9641" E
	51° 27' 18.6516" N	0° 39' 55.1293" E
	51° 27' 0.6588" N	0° 36' 29.8230" E
then by arc of a circle radius 7.5NM (13890m) centred on the runway 24 threshold: to	51° 33' 57.327" N	0° 40' 59.963" E
	51° 27' 27.4212" N	0° 35' 1.6000" E

G.10.2. Delegated Class D controlled airspace: SFC to 1500ft amsl.

H. 'GUNFY'[26] Terminal Holding Pattern Design Brief

H.1. This Appendix details the design brief to be submitted to the Accredited Procedure Designer (APD) for the development of a Terminal Arrival Fix and Holding Pattern for LSA inbound traffic at 'GUNFY' in accordance with the requirements of CAP785. The design brief is intended to be suitable for use by an APD who has not been involved in the LSA ACP development and who may not be aware of the overriding ATS requirements for holding pattern design.

H.2. Design Brief Introduction

H.2.1. This design brief is to facilitate the design of a new Terminal Holding Pattern in the vicinity of the existing ATS Significant Point TRIPO[27] to serve arriving traffic to London Southend Airport (LSA). This hold is currently nicknamed 'GUNFY' for ease of reference

H.2.2. The UK Civil Aviation Authority (CAA) requires that all Instrument Flight Procedures (IFPs), including Holding Patterns, Standard Arrival Routes (STARs) and the Initial Approach Procedures from holding patterns are designed by professional procedure designers (APDs) accredited by the CAA and submitted to the CAA for approval in accordance with the process and requirements specified in CAP785[28].

H.2.3. The requirement for a new Terminal Holding Pattern for LSA derives from an ACP which is under development by LSA for the re-establishment of controlled airspace in the vicinity of LSA and associated ATM procedures which are integrated and compatible with the both the existing and the future ATM arrangements in the overlying and adjacent London Terminal Control Area (LTMA). The ACP is being developed, and will be submitted to the CAA, in accordance with the requirements of CAP725[29].

H.2.4. Thus, the new Terminal Holding Pattern must satisfy the CAA Policy and regulatory requirements for both airspace and procedure design together with the ATM requirements for the new and reconfigured airspace operation. It must also take due regard of other immutable aspects of the airspace arrangements (e.g. airspace restrictions, Danger Areas, etc.) and the regulatory requirements applicable to them.

H.2.5. A suitable configuration for a new Terminal Holding Pattern which meets the ATM requirements of both LSA ATC and NATS London Terminal Control (LTC) Operations has been developed by the airspace design team. This design brief is to enable the formal procedure design documentation to be developed by the APD:

- in a format suitable for submission to the CAA under the CAP785 arrangements; and

[26] Provisional 5-Letter Name Code (5LNC) Working Designator. A formal 5LNC designator will be obtained in accordance with CAA Policy Statement 14 October 2013 prior to promulgation.
[27] UK AIP ENR4.4-18
[28] CAP785: Approval Requirements for Instrument Flight Procedures for Use in UK Airspace.
[29] CAP725: CAA Guidance on the Application of the Airspace Change Process

- To enable formal confirmation of the required separation from adjacent terminal holding patterns, procedures and airspace restrictions in a format suitable for submission to the CAA under the CAP725 arrangements; and
- To satisfy the Safety Management requirements of both LSA and NATS LTC.

H.3. Outline of the Operational Requirement

H.3.1. LSA is currently overlaid by the London Terminal Control Area (LTMA) with a base level of 3500ft amsl. Immediately above LSA within the LTMA a terminal holding pattern SPEAR[30] is established serving STAR procedures principally to London City Airport (LCY), but shared with LSA, Biggin Hill and Rochester arrivals[31]. This area of the LTMA also contains departing and arriving traffic from/to LCY at 4000ft and above which are, in turn, constrained by departure and arrival procedures and routes from/to other LTMA airports. Below the LTMA an IAP holding Pattern at SND NDB[32] serves instrument approach procedures to LSA itself. Due to the overlying LTMA complexity, only 2 holding levels, 2000ft and 3000ft, are available at SND NDB.

H.3.2. New CAT traffic operations and forecast CAT traffic growth LSA since 2011 have led LSA to develop an ACP for the re-introduction of controlled airspace to enhance and ensure the safety of LSA arriving and departing CAT flights in the critical stages of flight prior to landing and immediately after departure and to facilitate a more integrated ATM operation to and from the LTMA route structure.

H.3.3. Notwithstanding the proposed reconfiguration of arrival procedures for LCY which is under development by NATS, a requirement will remain for the foreseeable future for the LTMA airspace above LSA to continue to be occupied predominantly by LCY departing and arriving traffic.

H.3.4. However, as LSA CAT traffic grows, an operational requirement exists for the availability of more discrete holding levels for LSA traffic and, ideally, such holding should be away from the LSA overhead for both operational and environmental reasons.

H.3.5. Thus, within the airspace developed for the LSA ACP, a terminal holding pattern has been developed at GUNFY which serves the operational requirements of both LSA and NATS in the future LTMA configuration.

[30] UK AIP ENR4.4-17
[31] UK AIP AD2.EGLC-7-1/3/4/5
[32] UK AIP AD2-EGMC-8

H.4. 'GUNFY' hold specification

H.4.1. The specification for a holding pattern at GUNFY which meets the LSA and NATS ATM requirements and the CAA Performance Based Navigation (PBN) Policies[33] is detailed in this Section.

H.4.2. In addition, a number of additional evaluation requirements are specified to ensure, and to demonstrate to the CAA in accordance with the provisions of CAP725, that the proposed holding pattern development is sound.

H.4.3. GUNFY Holding Pattern

Holding Pattern:	RNAV;
RNAV Specification:	For aircraft equipped and approved for RNAV-1 (or better) operations in European Terminal Airspace.
Holding Fix:	East of TRIPO (514247 N 0010458 E) on the track JACKO-TRIPO at a position whereby the Holding Area protection is enclosed by the proposed CTA-6 that was consulted upon during the CAS ACP process.
Holding axis:	Inbound track JACKO[34] (514409 N 0012536 E) - TRIPO
Direction:	Right Hand
Winds:	UK Winds
Timing:	1 minute; **OR** outbound leg distance limiting if reduced airspace occupancy can be gained[35]. (Demonstrate both if the latter is feasible.)
Speed:	Maximum 195Kt. (To ensure separation from SPEAR hold and minimise conflict with adjacent Danger Areas and ATS routes.)
Levels:	Lowest holding level 4000ft; Maximum holding level 6000ft;
Entry:	Direct (Sector 3) entry only to reduce airspace volume.
	Suitable RNAV entry fixes to be created (as provided for VOR/DME holding[36]) as follows:
	i) To provide entry for routes (STARs) from the west and north-west via a secondary (entry) fix located towards the end

[33] CAA Policy for the Application of Performance-based Navigation in UK and Irish Airspace. 13 Oct 2011. Para 4.3.2

[34] UK AIP ENR 4.4-9

[35] PANS-OPS Volume 2, Part III, Section 3, Chapter 7, para 7.7.7.7(c)

[36] PANS-OPS Volume 2; Part III, Section 3; Chapter 7 para 7.3.1: Part II, Section 4; Chapter 1, para 1.4.4(b) and 1.5.1.

of the outbound leg suitable for entry speeds at a specified speed limit of 210kt at the entry fix;

ii) To provide entry for routes (STARs) from the south and south-east which must route to the east of the D138 complex at a specified speed limit of 210kt at the entry fix and in compliance with the CAA Safety Buffer Policy with respect to Danger Areas[37].

Note: Whilst the formal STAR procedure routes construction and promulgation will be a separate exercise dependent on NATS requirements for LTMA routes, nonetheless suitable entry fixes should be developed and submitted as part of the holding pattern development.

Separation: Templates should be provided to demonstrate:

i) That lateral separation exists (i.e. basic holding areas do not overlap) between GUNFY hold and SPEAR hold up to 6000ft. Note: Although currently promulgated with a maximum holding speed of 180kt, CAA approval has been granted for this to be increased to 195kt;

ii) Basic holding area overlap of Danger Areas D138/D138A/D138B at 4000ft, 5000ft and 6000ft, together with WGS-84 coordinates of where these areas cross the Danger Area complex external boundaries.

H.5. Documentation

H.5.1. Documentation is required to satisfy CAA regulatory requirements specified in CAP785 for approval of IFPs.

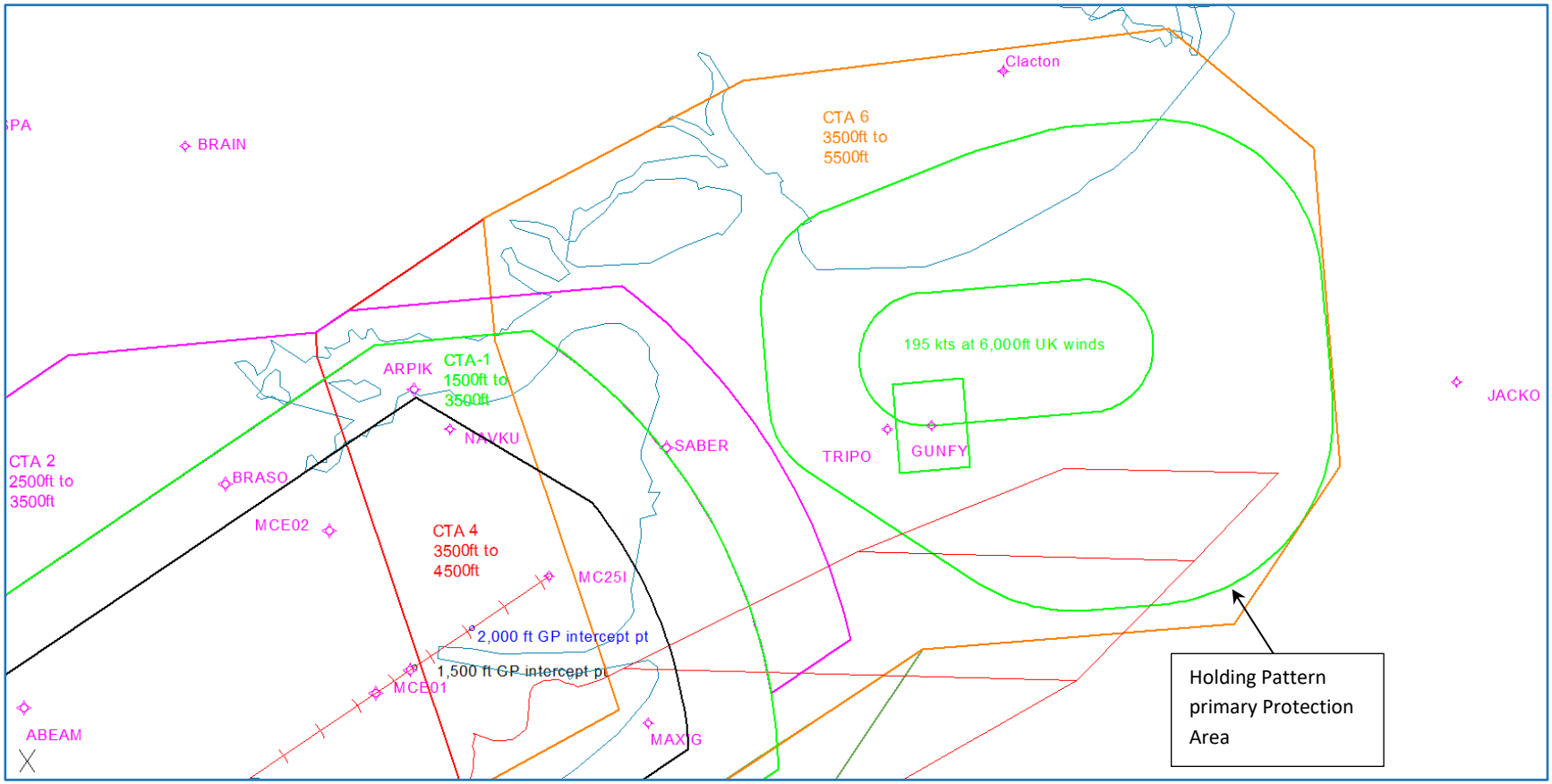
H.5.2. Graphics are required to demonstrate the nominal holding track, basic holding area and entry fixes against a geographical and airspace background at 4000ft, 5000ft and 6000ft. Existing and proposed (ACP) airspace configurations to be depicted separately.

H.5.3. Graphics are required to demonstrate the 195kt holding configuration for GUNFY as detailed above, and to demonstrate the separation between GUNFY and SPEAR holds at the speed combinations detailed above.

H.5.4. Graphics are required to demonstrate the interaction with the D138 complex as detailed above.

[37] CAA Policy Statement: Safety Buffer Policy for Airspace Design Purposes - Segregated Airspace 12 Nov 2010

H.6. Schematic diagram of 'GUNFY' Holding Pattern and Southend CTA-6.



I. Responses from Consultees

						Of responses				
Table	**Group**	**Consultees**	**Responses**	**Nil Responses**		**Support**	**No Objection**	**No Comment**	**Object**	**Non-committal**
1	Airport Users	37	13 (35.1%)	24 (64.9%)		11 (84.6%)	2 (15.4%)	-	-	
2	Airspace Users	58	43 (74.1%)	15 (25.9%)		3 (6.8%)	6 (14.0%)	4 (9.3%)	29 (67.4%)	1 (2.3%)
3	NATMAC Civil	29	16 (55.1%)	13 (44.8%)		3 (18.8%)	1 (6.3%)	4 (25.0%)	8 (50.0%)	
4	NATMAC Mil	7	(7) (100%)	-		(6) (100%)	-	1 (Regulator)		
5	Councils	24	21 (87.5%)	3 (12.5%)		5 (23.8%)	8 (38.1%)	4 (19.0%)	4 (19.0%)	
6	Parish Councils	128	79 (61.7%)	49 (38.3%)		8 (10.1%)	11 (13.9%)	28 (35.4%)	32 (40.5%)	
7	Env Orgs	9	4 (44.4%)	5 (55.6%)		-	2 (50.0%)	1 (25.0%)	1 (25.0%)	
8	MPs	22	8 (36.4%)	14 (63.6%)		1 (12.5%)	1 (12.5%)	3 (37.5%)	3 (37.5%)	
	Totals	**314**	**191 (60.8%)**	**123 (39.2%)**		**37 (19.4%)**	**31 (16.2%)**	**45 (23.6%)**	**77 (40.3%)**	**1 (0.5%)**

J. Schedule to implementation

J.1. This schedule lists the timetable of activity that has taken place prior to the submission of the ACP to CAA SARG together with the anticipated schedule of activity leading to implementation of the Southend CTR/CTA and associated procedures on 5 February 2015 (AIRAC 2/2015). Double AIRAC Notification has been assumed.

	Dates	Activity	Remarks
		Project Definition	
1	Aug 2012 – Feb 2013	Preliminary discussions; project definition, preliminary design	
2	27 Feb 2013	Framework Briefing	
		Focus Group Stage	
3	Jan – Feb 2013	Focus Group Stage	
4	Feb – May 2013	Review FG input; refine proposal configuration	
5.	29 May 2013	Report on FG Consultation Decision to proceed	
		Sponsor Consultation Stage	
6	Jun – Sept 2013	Develop SCD	
7	20 Sep 2013 – 19 Dec 2013	Sponsor consultation	13 weeks
8	Dec 2013 – Feb 2014	Review Sponsor Consultation responses; develop Report of Sponsor Consultation	
9	28 Feb2014	Report of Sponsor Consultation published	
10	Mar – Apr 2014	Post Sponsor Consultation Reviews and refine airspace development	
11	Mar – May 2014	Develop ACP document	
12	May – Aug 2014	Commission and develop revised IAPs	CAP785

		CAA Stage	
13	**30 May 2014**	**ACP submission to SARG**	
14	30 May - 13 Jun 2014	SARG Documentation Check	2 Weeks
15	13 Jun - 3 Oct 2014	SARG ACP Case Study	16 weeks
16	30 May – 03 Oct 2014	Assist CAA Supplementary Questions	
17	14 Aug 2014 (Latest Date)	IFP Submission to SARG	CAP785
18	3 Oct 2014	SARG Regulatory decision, NATMAC Informative Letter	
19	17 Oct 2014 (Latest Date)	SARG Approval of IFPs	CAP785

		Implementation Stage	
20	June – Oct 2014	Preparation of AIS material Preparation of ATC material	Prepared in advance in anticipation of approval
21	**17 Oct 2014**	**Data to AIS for AIRAC 02/2015**	**For completeness, airspace and IAP data submitted together.**
19	27 Nov 2014	AIRAC 02/2015 distribution	Double AIRAC Notification
20	04 Nov 2014	AIC data to AIS	
21	18 Dec 2014	AIC publication	
22	**05 Feb 2015**	**AIRAC 02/2015 effective date**	
23	Feb 2016	Post-Implementation Review	