SAFETY AND AIRSPACE REGULATION GROUP
Airspace Regulation

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Manager Airspace Regulation

UPDATE OF THE 2013 LOWER AIRSPACE RADAR SERVICE (LARS) PROVISION REVIEW

Background

1. LARS was formally introduced in 1979 as a funding scheme to reimburse Air Navigation Service Providers (ANSPs) for the provision of the radar service element[1] of UK Flight Information Services (UK FIS). Under the scheme ANSPs provide a radar service to aircraft flying outside Controlled Airspace (CAS), up to and including FL95 within the limits of radar/radio cover.

Introduction

2. In September 2013 the Safety and Airspace Regulation Group (SARG) performed a review of service provision for LARS, which was an update from the 2008 LARS Review. The Review Group included representatives from National Air Traffic Services (NATS), Airport Operators Association and the Ministry of Defence (MoD), and made some recommendations on suggested ways to improve the existing scheme whilst maintaining the standard of service and level of safety currently provided. It recognised the finite resource available and looked at ways of possibly redistributing this to maintain maximum coverage.

Aim

3. This update provides a statistical analysis of 2015 LARS usage, with a view to comparing it to the analysis from the 2008 Review which looked at demand for different types of LARS services. This includes looking at the fluctuating demand for LARS between week days and at the weekend, and therefore the impact of certain LARS units being closed at the weekend. In addition this update provides a correlation of current LARS areas of responsibility in relation to UK Airprox reports, looking to identify areas which potentially have higher risk of collision in Class G airspace and are not currently covered by LARS units operating hours. Using Airprox reports to form a risk based assessment it can be ascertained whether the current construct of units, where some (primarily military) are not available at the weekend, would be best served by switching to other providers if a suitable alternative is available and resource allows. This update also summarises the 2013 LARS Review and informs on any recommendations or options which have, or have not, been adopted.

Existing Service Provision

4. There are currently 26 Air Traffic Service Units (ATSUs) (14 military, 12 civilian) providing UK FIS under the LARS scheme. This is a reduction of 1 civilian unit since the 2013 Review, owing to the closure of Kent International. These units receive remuneration based primarily on

[1] Basic Service (BS) does not fall within the remit of LARS although it is mostly available on request.

the hours that services are provided and the amount of traffic that is worked. However, there is no formal contract and therefore no obligation on ATSUs to provide LARS. In many cases, especially at the MoD airfields, the provision of LARS is based on spare capacity in terms of equipment and staff established for other purposes such as 'zone control'.

5. There is no mandatory requirement on airspace users to utilise LARS. However, pilots are encouraged to make use of the service in order to enhance the safe and efficient use of Class G airspace, in particular to aircraft operating from or in the vicinity of an aerodrome, by creating a more 'informed environment'. Whilst difficult to quantify the benefit of LARS, it undoubtedly provides an additional layer of safety in the areas of coverage.

Statistical Analysis of LARS Usage 2015

6. The 2008 LARS Review looked at statistical analysis gathered between Apr – Oct 2007. To be able to draw some comparisons, and also to look at current demand, the following statistical analysis is based on LARS data collected between Apr – Oct 2015. Owing to how the data was collected it is impossible to perfectly replicate the 2007 trial; however, as per the 2008 report conclusions, the requirement to provide LARS over night is no longer deemed necessary owing to demand for LARS being only 0.5% (overnight weekday) and 0.1% (overnight weekend), and resource therefore better focused on higher demand times. In addition the 2015 data has been split into civil and military LARS usage for further analysis.

7. The 2015 raw data is collated at Annex A, and the summary totals are presented below. The tables show UK FIS radar services, Deconfliction Service (DS), Traffic Service (TS) and also the non-radar Basic Service (BS) statistics. UK FIS was introduced in March 2009 seeing a change to the names and elements of service provision. For ease of evaluation with 2007 data a straight comparison has been drawn between DS and Radar Advisory Service; TS and Radar Information Service, and BS and Flight Information Service.

Apr-Oct 2007	Total RAS/RIS	% Total RAS/RIS	Total FIS	% Total FIS	Total all Services	% Total Services
Mon-Fri	103520	92%	164038	79%	267558	83%
Weekend	8857	8%	44264	21%	53121	17%
Totals	112377	100%	208302	100%	320679	100%

Table 1: April – October 2015 LARS Statistics

Apr-Oct 2015	Civil DS/TS	Mil DS/TS	Total DS/TS	% Total DS/TS	Total BS	% Total BS	Total all Services	% Total Services
Mon-Fri	36579	34610	71189	84%	104663	73%	175852	77%
Weekend	10120	3608	13728	16%	38779	27%	52507	23%
Totals	46699	38218	84917	100%	143442	100%	228359	100%

Table 2: April – October 2015 LARS Statistics

2007			2015		
Total RAS/RIS	112377	35%	**Total DS/TS**	84917	37%
Total FIS	208302	65%	**Total BS**	143442	63%
Total all Services	320679	100%	**Total all Services**	228359	100%

Table 3: Percentage 2007 and 2015 Radar and Non-Radar Services

8. As per 2007 (92%), there is still a clear indication that the greatest demand for radar services remains during the week (84% of total radar services). There also remains a significant demand for LARS units to provide non-radar services, with BS making up 63% of the total of all services provided. This remains similar to the demand in 2007, which was 65%, and reflects the significant amount of pilots who use LARS units for non-radar services rather than Scottish/London Information.

9. There is a general perception from GA that demand for LARS is greatest on the weekend as this is when the majority of recreational flyers are airborne. Table 4 below looks at the average daily demand for services.

2015	Total DS/TS	Daily Average DS/TS	Total BS	Daily Average BS	Total All Services	Daily Average of All Services
Mon – Fri	71189	14238	104663	20933	175852	35170
Weekend	13728	6864	38779	19390	52507	26254
Total	84917	12131	143442	20492	228359	32623

Table 4: Daily Average of Services Provided

10. The daily average of each service type is calculated by dividing the week figures by 5, weekend by 2 and weekly total by 7; in essence creating a directly comparable ‘day’ demand figure for each. (These are shown in the purple cells in the table above.) Here it can be seen that proportionally as an average of all services combined, there is greater demand on a weekday (35170) than at the weekend (26254). This equates to 25% more demand on all types of services from LARS ANSPs on weekdays rather than weekends.

11. The figures also highlight that there is over twice as much demand for radar services during the week (14238) than at the weekend (6864). However, the daily average for BS remains almost constant for both the week (20933) and weekend (19390).

12. The statistics show a different demand for types of service at the weekend, inferring a different type of user is requesting these services. Whilst the military rarely fly at the weekend, their Air Squadrons and gliders do; and the GA appears to change to the sports and recreational based users who would appear more interested in receiving a BS. On a weekend, LARS units provide on average nearly three times as many BS (19390) over radar services (6864). Whilst some of this could be associated to the reduction in radar units available at a weekend, the over-lapping cover and diverse figures suggest it is more related to demand. Whilst inferring less radar units are required at the weekend owing to reduced demand, this does not cater for either the

constant demand for BS or look to maximise LARS coverage in particular in areas which could be deemed 'higher risk airspace'.

13. In an attempt to identify 'higher risk airspace' areas not covered by LARS services, a correlation of current LARS provision areas was overlaid with UK Airprox Reports.

Correlation of Current LARS Provision Areas with UK Airprox Reports

14. Whilst defining and recording 'risk' in Class G airspace is exceptionally problematic, Airprox reports can be used to identify specific locations where there was a 'risk of collision' or where 'safety was not assured'. These are the definitions of Airprox Risk Categories A and B which can be found on the Airprox Board website here. An Airprox is defined as *"a situation in which, in the opinion of a pilot or air traffic services personnel, the distance between aircraft as well as their relative positions and speed have been such that the safety of the aircraft involved may have been compromised"*.

15. By looking at the correlation between Airprox Category A and B reports and current LARS coverage, an assessment can be made on the suitability of the current LARS region for providing a service to aircraft in areas where the highest levels of risk occur. The aim would be to achieve LARS coverage in as greater portion of 'high risk airspace' as possible, under the premise that LARS offers a significant level of risk mitigation, preventing numerous other airborne incidents that may otherwise have occurred. The 2014 Helios Class G Airprox Report Analysis stated that aside from 'pilot recovery' (see and avoid) the other significant barrier to successfully preventing Airprox was 'ATC tactical intervention which was the application of UK FIS'.

16. Airprox data between 2010 - 2015 was filtered to leave Category A and B incidents which occurred below FL100 and outside controlled airspace, in essence the maximum potential UK LARS region, and plotted on a map also showing current LARS provision areas. This diagram is at Annex B, whilst Annexes C and D represent the Airprox broken down to occurrences during the week and weekend respectively.

17. Table 5 below shows the breakdown of week and weekend occurrences for each category of Airprox.

	AIRPROX Cat A			AIRPROX Cat B		
	Week	Weekend	TOTAL	Week	Weekend	TOTAL
2010	10	2	12	28	5	33
2011	15	8	23	23	11	34
2012	12	5	17	23	3	26
2013	15	6	21	26	17	43
2014	14	13	27	41	24	65
2015	21	13	34	40	11	51
Total	87	47	**134**	181	71	**252**

Table 5: Total Cat A and B Airprox in the UK LARS Region

18. To be able to analyse the effectiveness of current LARS units' coverage within the UK LARS region, the Airprox data from Table 5 above was broken down into the percentage of incidents occurring within the LARS units' areas of responsibility. As the LARS coverage area reduces at the weekend owing to fewer units being open, the potential impact of this is analysed by specifically looking at the percentage of Airprox which fall within this reduced weekend area.

19. It is worth noting that the analysis of Airprox that fall inside LARS coverage is fairly rudimentary in that units regularly overlap or have local arrangements which change the shape of their coverage. However, for the principle of comparison it is a useful baseline.

	Week			Weekend			TOTAL		
Cat A	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Total Airprox**	**No. in LARS Unit cover**	**% in LARS cover**
2010	10	8	90	2	1	50	12	9	75
2011	15	15	100	8	7	88	23	22	96
2012	12	11	92	5	5	100	17	16	94
2013	15	12	80	6	5	83	21	17	81
2014	14	13	93	13	11	85	27	24	89
2015	21	20	95	13	10	77	34	30	88
Total	87	79	91%	47	39	83%	134	118	**88%**

Table 6: Cat A Airprox in LARS Unit Coverage

	Week			Weekend			TOTAL		
Cat B	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Total Airprox**	**No. in LARS Unit cover**	**% in LARS cover**
2010	28	23	82	5	4	80	33	27	82
2011	23	23	100	11	10	91	34	33	97
2012	23	22	96	3	3	100	26	25	96
2013	26	25	96	17	15	88	43	40	93
2014	41	35	85	24	20	83	65	55	85
2015	40	37	93	10	7	70	50	44	88
Total	181	165	91%	70	59	84%	251	224	**89%**

Table 7: Cat B Airprox in LARS Unit Coverage

20. Tables 6 and 7 above show that the average percentage of Airprox contained within LARS cover falls from 91% to 83% for Cat A and 91% to 84% for Cat B, when comparing occurrences during the week against those at the weekend. With total Airprox averages for Cat A and Cat B remaining similar at 88% and 89% respectively, this strongly infers that the coverage of LARS units during the week covers more 'higher risk airspace' than at the weekend. The statistics clearly show that current weekly LARS coverage is well placed to cover 91% of Cat A and B Airprox locations, whilst at the weekend this is only 83-84%.

21. During 2010 – 2015 there were 19 Cat A (8) or B (11) Airprox which occurred at the weekend outside of LARS units' areas of responsibility (Annex E). Annex F superimposes the weekend closed LARS units over these, demonstrating that of the 19 Airprox, 9 occurred within LARS units' areas of responsibility which were closed for the weekend. All 9 of these fell within the areas of RAF Shawbury and BAe Warton. (Figure 1 below.)

22. Reallocating the LARS funding released by the closure of Kent International would allow for the introduction of East Midlands Airport into the scheme, with a view to providing LARS within a 30nm area of responsibility 7 days a week. Figure 1 below shows that in this instance 4 of the 9 Airprox which occurred within the areas of responsibility of LARS units whilst they were closed for the weekend would then have been covered by a LARS provider. The cluster of these incidents

would also indicate that a potential weekend 'hot spot' area would be covered. This by no means infers the incidents would not have occurred, but it would offer a level of risk mitigation.

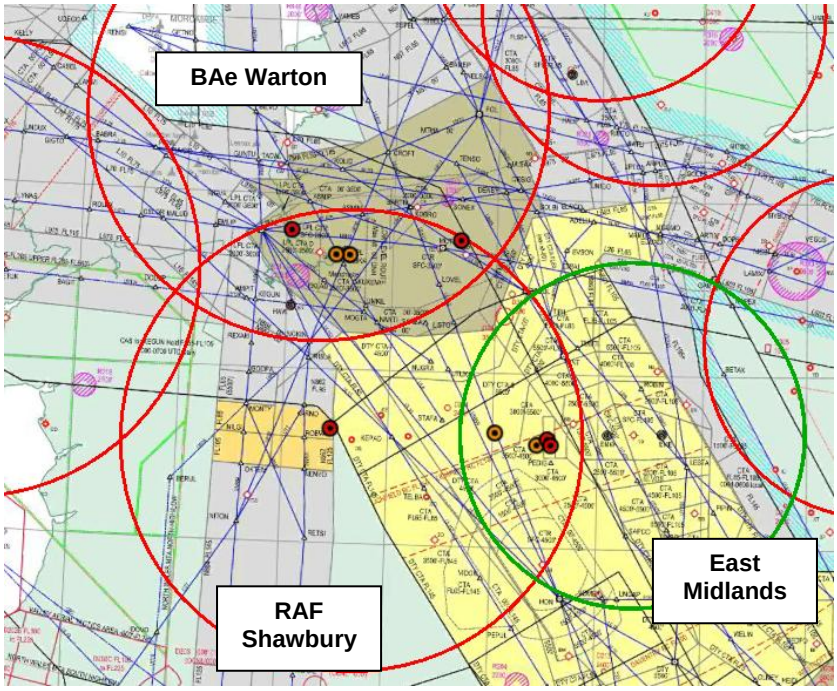


Figure 1: 2010 – 2015 Weekend Airprox occurring within 30nm of East Midlands

23. The inclusion of military units in the LARS scheme, and in particular the impact of the vast majority of them closing at the weekend can be further investigated. It can be argued that owing to their unpredictable flight path, speed, high energy manoeuvres, low level flight etc, that military aircraft operating in the vicinity of and arriving/departing from their base are one of the greatest sources of risk of collision in Class G. Aside from pilot look out, the best form of mitigation is for the same unit controlling these, and with the closest radar head, to also provide a UK FIS service to transiting aircraft to create a more informed environment. To analyse the risk associated with military aircraft in Class G and LARS, the number of Airprox involving military aircraft which occurred within Military LARS Units Areas of Responsibility during the week and at the weekend are detailed below.

Airprox Within Military Units LARS Areas of Responsibility						
2010 to 2015	AIRPROX Cat A			AIRPROX Cat B		
	Total	Involving Military Aircraft	% Involving Military Aircraft	Total	Involving Military Aircraft	% Involving Military Aircraft
Week	39	29	74	80	63	79
Weekend	18	0	0	16	5	31

Table 8: Airprox within Military LARS Areas of responsibility Involving Military Aircraft

24. Table 8 above shows a very strong correlation where during the week 74% of Cat A and 79% of Cat B Airprox occurring within Military LARS Units Areas of responsibility involve military aircraft. However, at the weekend when the majority of Military units are closed and therefore significantly fewer military aircraft are flying, the percentages involving military aircraft fell to 0%

and 31% respectively. (The Cat B Airprox data includes 2 events with Military gliders.) This strongly infers that the highest risk in these areas is from military aircraft.

Review of the 2013 Recommendations

25. A summary of the 2013 LARS Review including the options, generic changes and recommendations made is at Annex G. These recommendations are reviewed in turn below.

26. **Recommendations a, b, and c** describe removing 7 military LARS units from the scheme, releasing funds to (subject to their agreement) enable the replacement units of Inverness, Glasgow, Aberdeen and RAF Wittering. The replacement of these units would achieve the aim of significantly increased LARS coverage in Scotland. However, the effect of this option requires further analysis, in particular the potential benefits versus the impact.

27. Annexes H to J show the '2013 LARS Review recommended LARS Units', with 2010 – 2015 Airprox Cat A and B plotted in total and then for week day and weekend only. To be able to draw a direct comparison on the effectiveness of these recommended changes, the Cat A and B Airprox have been calculated falling purely within this new recommended LARS coverage area.

	Week			Weekend			TOTAL		
Cat A	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Total Airprox**	**No. in LARS Unit cover**	**% in LARS cover**
2010	10	7	70	2	1	50	12	8	67
2011	15	15	100	8	7	88	23	22	96
2012	12	12	100	5	5	100	17	17	100
2013	15	12	80	6	5	83	21	17	81
2014	14	13	93	13	11	85	27	24	89
2015	21	20	95	13	10	77	34	30	88
Total	87	79	91%	47	39	83%	134	118	**88%**

Table 9: Cat A Airprox for 2013 Review Recommended LARS Unit Coverage

	Week			Weekend			TOTAL		
Cat B	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Airprox**	**No. in LARS Unit cover**	**% in LARS cover**	**Total Airprox**	**No. in LARS Unit cover**	**% in LARS cover**
2010	28	23	82	5	4	80	33	27	82
2011	23	23	100	11	11	100	34	34	100
2012	23	23	100	3	3	100	26	26	100
2013	26	25	96	17	15	88	43	40	93
2014	41	36	88	24	20	83	65	56	86
2015	40	38	95	10	7	70	50	45	90
Total	181	168	93%	70	60	86%	251	228	**91%**

Table 10: Cat B Airprox for 2013 Review Recommended LARS Unit Coverage

28. Table 9 compared with Table 6 show that there is no change in Cat A Airprox for either the week or weekend. Table 10 compared to Table 7 show that an additional 4 Cat B Airprox would have been covered by the new LARS region, 3 during the week and 1 at the weekend, showing a respective 2% increase in each. However, this is comparing the figures before the recommendation of introducing East Midlands Airport into the current scheme which would also provide cover for an additional 4 Airprox.

29. Changing the LARS areas of responsibility as per the 2013 Review raises additional concerns. By removing the 7 military units to offset the cost of this option does remove overlap in some areas, but these are around busy military units. It also significantly increases the area of responsibility for the other LARS providers, bringing into question the quality of service that could be provided. Lower level LARS transits would potentially receive a 'limited radar service' as they operated at the extremes of radar coverage, and larger areas of responsibility and less units would increase traffic numbers on a LARS frequency potentially creating 'frequency saturation' or forcing controllers to only provide BS due to workload. Aircraft who subsequently requested a 'zone' or transit service from an ex-LARS unit to mitigate these issues and glean traffic information on military aircraft in the local vicinity would create 'frequency separation' and exacerbate confusion. There is a balance to be struck between service provision and risk. Table 8 above shows that statistically the highest number of Airprox in the vicinity of military LARS units involves military aircraft; therefore one of the best forms of mitigation would be for aircraft to receive a UK FIS from the same military unit.

30. Expanding ANSPs areas, reducing overlapping service provision and introducing new LARS providers would undoubtedly increase the maximum area of coverage. However, achieving this by removing the stated military units from the LARS scheme would potentially come with additional risk. For example, an aircraft transiting the Somerset Levels near the Somerset/Dorset border would now have a service from Bournemouth, Bristol or Exeter; however, it would not be provided a radar service by the units operating in the immediate vicinity, namely RNAS Yeovilton or RAF Boscombe Down, who also operate military aircraft to/from their units and in the local area. The removal of these military units would also not be in line with one of the primary objectives of LARS ANSPs as stated in the 2013 Review.

> *"One of their primary objectives is to provide an Air Traffic Service (ATS) to aircraft in transit or operating in the vicinity of the aerodrome in order to coordinate these movements against air traffic arriving at and departing from the associated airfield. This creates an 'informed environment' which has the potential, in conjunction with a transponder, to reduce the amount of avoiding action for all aircraft concerned whilst enhancing the situational awareness of controllers and pilots alike."*

31. The obvious benefit to this recommendation is the increased coverage in Scotland. However, whilst sparse in LARS coverage, the introduction of 3 additional ANSPs only provided cover for an additional 3x Cat B Airprox over a 6 year period, as RAF Lossiemouth who is in the current scheme covered those occurring in the Inverness region.

32. **Recommendation d** suggested joining the funding currently provided for LARS and that for Flight Information Systems. LARS is funded by the DfT, whilst Scottish/London Information is part of the contracted services provided by NATS. Merging these 'funds' and creating a joint LARS/FIS service would therefore prove highly problematic. In addition, London Information is manned by FISO's who are not licensed to provide radar services. This would cause an issue if an aircraft required a service upgrade, and negates the intended benefits of getting aircraft in the same geographical location onto a single frequency for both BS and LARS. This could be rectified by utilising ATCOs rather than FISOs, but that in itself is extremely problematic and costly, and hence highly unlikely to ever be more than a theoretical concept without a significant injection of resource which is currently not available.

33. **Recommendations e and g** suggested that the LARS Statement of Requirement be re-written as a Provision of Service and be a legally binding contract between the CAA and the ANSP.

This would be required if the option was taken to mandate an increase in a units hours beyond those they currently provide. This has potential to cause friction between the ANSP and CAA, and could be potentially costly if an ASNP needs a manning uplift to cover the increased hours. There is significant risk that this could lead to units leaving the scheme rather than 'signing up', and create additional holes in the already stretched LARS coverage.

34. Generally there is no obligation for ANSPs to provide LARS. Mandating LARS provision would totally change the scheme into a formal contracted service covering stipulated areas of responsibility. Whilst this would undoubtedly provide opportunities for the best geographical and time coverage; for example creating LARS Super Units/Regional Hubs covering the entire UK by utilising a host of selected radar feeds, the complexity and cost of such an enterprise could be totally prohibitive. There is no additional funding from the DfT for LARS provision, therefore the only way of funding such an endeavour would be by private venture or to charge GA for the service. This is a highly contentious issue for which there is not only no appetite from the GA community, but also would be extremely costly to setup and administer. Both charging an annual fee to all GA (including members who never use the LARS), or on a 'pay as you use' principle is fraught with complications and cost. Without unprecedented investment, which is totally unachievable in the current economic climate, this recommendation is entirely unviable.

35. **Recommendation f** was the renaming of LARS to LAATS (Lower Airspace Air traffic Service) to formally incorporate BS into the scheme. Whilst achievable and supported by the statistics which show 63% of all services provided by LARS Units are BS, if adopted this has the potential to create significant confusion with the service currently available from Scottish/London Information. If in the future LARS and Scottish/London Information funding and service provision were to amalgamate, then a re-branding of the service should be taken up. This should also include funding a 'rebranding' educational programme.

36. **Recommendations h and i** suggest a review of how LARS charts are drawn and promulgated. The true LARS boundaries are heavily influenced by LoAs/MoUs between adjoining units, and are further complicated with several units having differing hours of operation, and some (primarily military) not operating at weekends whilst others attempt to cover the gaps created. Whilst a chart accurately depicting these changing boundaries would be difficult to produce on the scale replicated in the AIP, a compromise needs to be sought which more accurately depicts LARS 'regions' rather than strict boundaries, without further cluttering or complicating charts. The 2013 Review mentions the 1:250,000 and 1:500,000 charts; however, these do not depict LARS regions, instead they only publish frequencies which does not assist in annotating who a pilot should call where.

37. **Recommendation j** was to provide some financial support to ANSPs to host GA Fly-ins which promote and educate LARS and UK FIS. These would be both beneficial and potentially achievable. The finances available for this would vary year on year owing to ANSP categorisation and DfT funding available, therefore formalising an annual event may be an issue. However, an ad-hoc event could potentially be supported if deemed appropriate and finances allowed.

38. **Recommendation k** was to instigate formal feedback on LARS units and issues via NATMAC. Whilst achievable this is unlikely to influence the inclusion/exclusion of units in the scheme as suggested in the 2013 Review. This is not only owing to the perceived influence the feedback could have, but also to preserve continuity of units and the lack of potential replacement ANSPs available. More generic feedback presented annually via NATMAC would be welcomed though.

Conclusions

39. The 2007and 2015 statistical analysis demonstrates that whilst demand for LARS services has fluctuated in actual numbers, the percentage demand between radar services and non-radar services has remained fairly consistent. Of interest there is over twice the demand for radar services during the week than at the weekend, and overall demand for radar and non-radar

services combined is higher on week days as well. Whilst the reduction in LARS units available at a weekend may account for some of this, the overlapping cover available in most areas and apparent different user suggest it is more related to actual demand.

40. Whilst an obvious impact of military LARS units which close at the weekend is a reduction in coverage area, this would not appear to be at the expense of increased risk of collision in Class G in these areas. Airprox data suggests that around 74-79% of Cat A and B Airprox occurring within military LARS units areas of responsibility involve military aircraft; therefore when station flying ceases, such as at the weekend, there is arguably a proportional and significant reduction in the risk, mitigating the closure of these LARS units. The ability for the military units to provide LARS during the week is viewed as the key mitigating factor to reduce the risk of collision between military aircraft and GA transiting in these areas, and the military unit's continuance in the LARS scheme is highly desirable.

41. The 2013 LARS Review proposed several recommendations to increase service provision for both geographical and time coverage. By choosing elements of two options rather than a single approach, and blending these with additional recommendations, it provided a comprehensive change package. However, owing to significant resource issues it would prove highly problematic to implement them all. A concern is the proposed contractual obligation for ANSPs to provide LARS for increased hours for smaller remuneration. Regulatory oversight and enforcement of the contract would also have a significant administrative and financial burden. In addition, without being able to charge GA and therefore dramatically increase resource, the more far-reaching changes recommended prove to be out of reach at present.

42. More and more units are becoming dependent upon the financial remuneration offered for providing LARS. The concept of the service being offered from 'irreducible spare capacity' is outmoded with more units using the financial support to employ dedicated or additional controllers to ensure the service is provided. The term 'irreducible spare capacity' is better suited to military units who would generally be providing a 'zone control' service to provide a better known environment for station based aircraft operating in the local vicinity or when arriving/departing. If military zone control was separated from LARS, there would be frequency separation between conflicting aircraft increasing controller and pilot workload and potentially increasing risk.

43. Notwithstanding this, several improvements can be made to the current system, including the introduction of a new ANSP in 2017 which provides service provision in a current 'gap'. Other areas can also be looked at, but whilst coverage could be addressed in some areas deemed poor, such as Scotland, the introduction of new ANSPs would come at the cost of a 'compensatory reduction' of service elsewhere as funds are re-directed. Feedback from GA, and comment on social media, not surprisingly highlights the SE of England as an area where additional coverage is desired. The Airprox data also indicates that this is where risk in class G is highest. Unfortunately since the closure of several units, most recently Kent International, finding suitable ANSPs to provide LARS in this area is highly problematic.

44. GA feedback on LARS charting is noted, and this requires addressing. The AIP LARS chart requires updating to more accurately reflect service regions taking into account LoAs/MoUs between adjacent units. In addition a new chart should be created depicting LARS regions at weekends and 'out of hours', as well as 'core' weekday coverage. This would be beneficial as the AIP chart is replicated in GA planning documents such as the Pooleys and AFE VFR Flight Guides.

45. Appropriate NATMAC representatives should be invited to gather, collate and forward suitable feedback on LARS to Airspace Regulation annually after their November meeting. Listening and reacting to constructive feedback from all stakeholders should be an ongoing arrangement.

46. A summary of actions and future works strands is in the table below.

	Action
1	Introduction of East Midlands Airport into LARS scheme 2017.
2	Continually Review and Research Airprox hotspots and Locations where new ANSPs would make a significant different if introduced to the LARS Scheme
3	Create a new LARS coverage chart which more accurately reflects service regions including week/weekend cover.
4	Instigate annual feedback on LARS ANSPs via NATMAC.
5	Investigate 'ad hoc' GA 'Fly-in' days to educate on LARS and UK FIS.

Table 11: Action Plan for LARS

47. Whilst far from perfect in its coverage and time provision, the current LARS scheme should be viewed in a very positive light. Covering an area which encapsulates 91% of week day and 84% of weekend Cat A and B Airprox, demonstrates that it provides an exceptionally important additional layer of safety in a high proportion of Class G airspace that can be deemed 'higher risk'. This benefit is afforded to all airspace users from an extremely limited resource, proving excellent value for money. That said, as and when opportunities arise to invite new ANSPs into the scheme who could improve the coverage, particularly in areas where traffic density or previous Airprox locations deem appropriate, these should be embraced.

[redacted]
Airspace Regulator

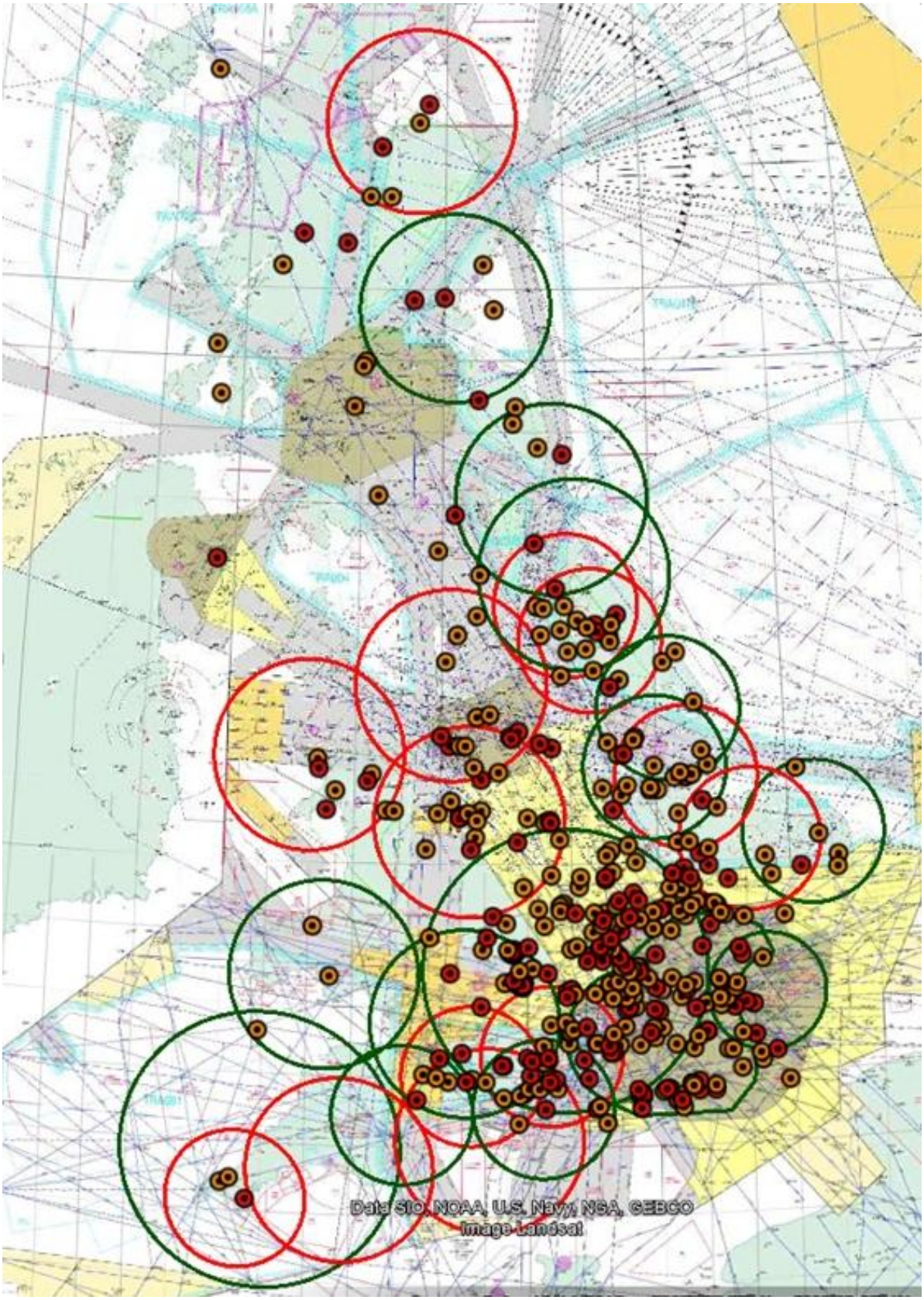
Annexes:

A LARS Statistics Apr – Oct 2015
B 2010 – 2015 LARS Regions with Airprox Cat A and B
C 2010 – 2015 Week Day Airprox Cat A and B
D 2010 – 2015 Weekend Airprox Cat A and B
E 2010 – 2015 Weekend Airprox Cat A and B Outside of LARS Areas of Responsibility
F 2010 – 2015 Weekend Airprox Cat A and B and LARS Units Closed for the Weekend
G Summary of the 2013 LARS Review Including Options and Recommendations
H 2013 LARS Review Recommended LARS Units Showing Airprox Cat A and B
I 2013 LARS Review Recommended LARS Units Showing Week Day Airprox Cat A and B
J 2013 LARS Review Recommended LARS Units Showing Weekend Airprox Cat A and B

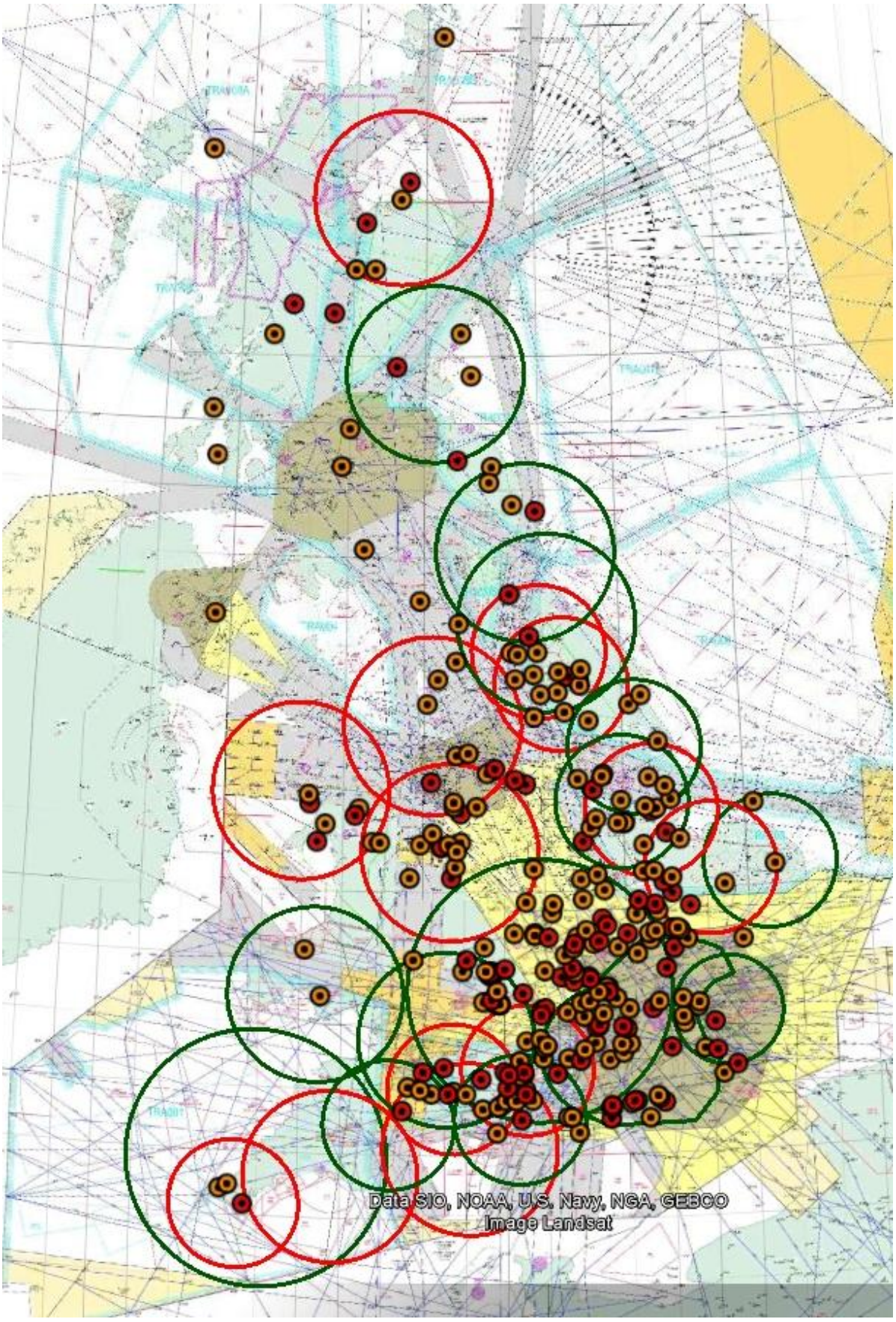
LARS Statistics Apr – Nov 2015

20151209 LARS
Stats Apr-Oct 15.xlsx

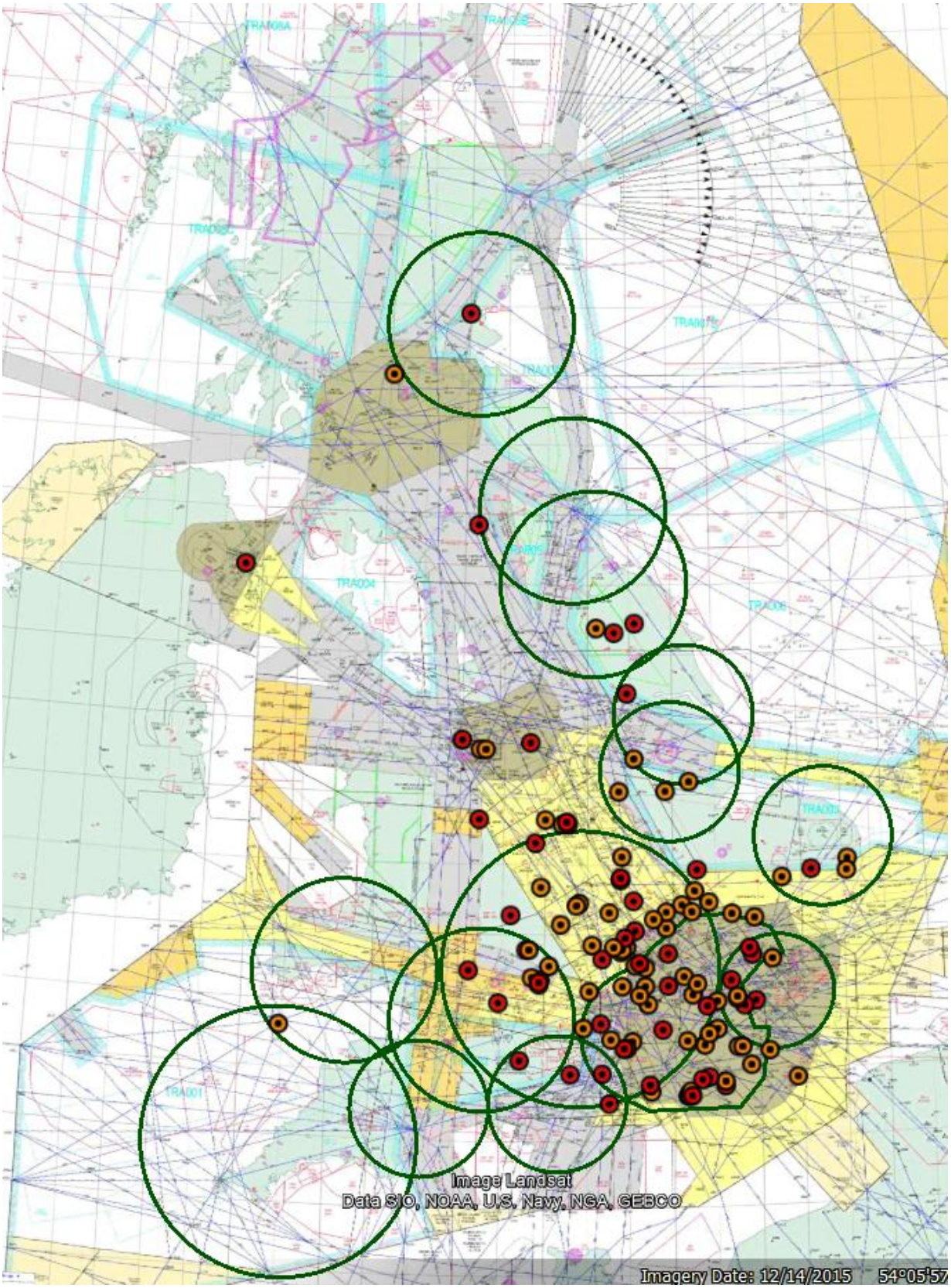
2010 – 2015 LARS Regions with Airprox Cat A and B



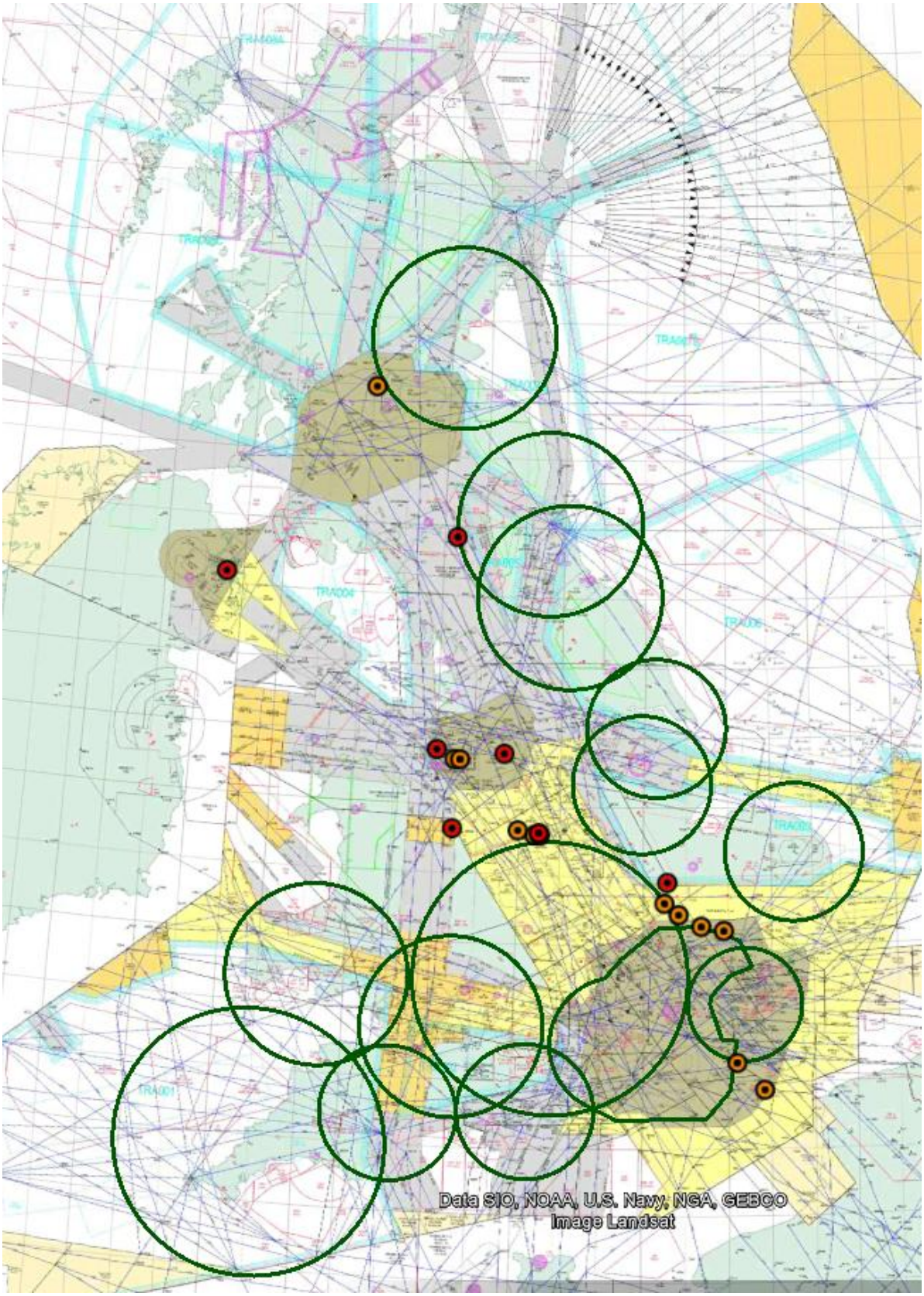
2010 – 2015 Week Day Airprox Cat A and B



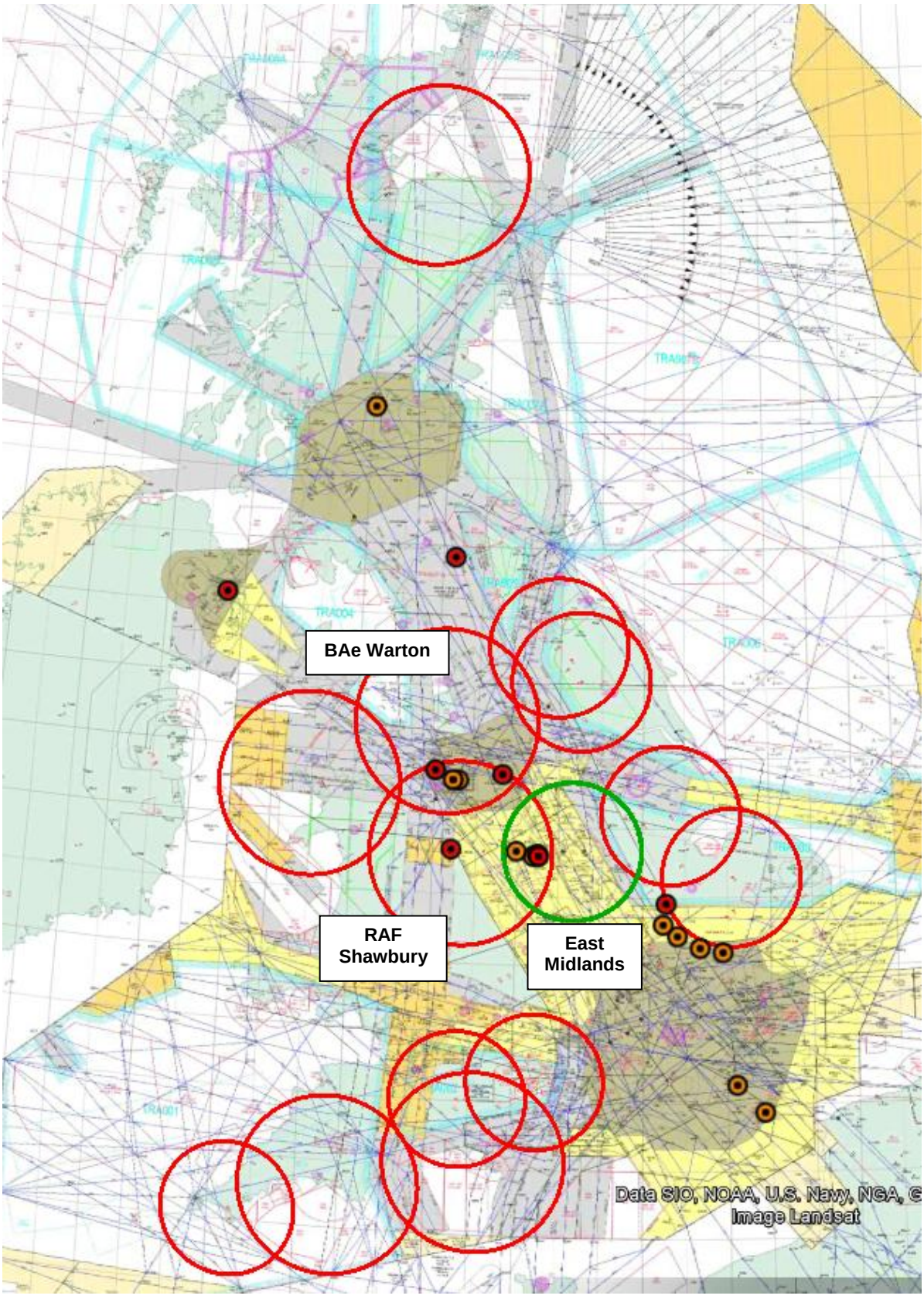
2010 – 2015 Weekend Airprox Cat A and B



2010 – 2015 Weekend Airprox Cat A and B outside LARS Units' Areas of Responsibility



2010 – 2015 Weekend Airprox Cat A and B
And the LARS Units' Areas of Responsibility Which Were Closed for the Weekend.



Summary of the 2013 LARS Review Including Options and Recommendations

1. The 2013 Review identified the following series of issues with the existing system:

   a. *There is a large disparity between weekday and weekend LARS coverage mainly because of the weekend closure of Military LARS Units. Generally it is deemed that there is an over provision of service during the week and under-provision on the weekend.*

   b. *Non-existent formal LARS coverage on the weekend over large areas of Scotland and Wales. No provision for LARS in Northern Ireland.*

   c. *The annotation of LARS coverage in the AIP and on charts combined with the wide variation of coverage hours leads to confusion about which ATSU an aircraft should be speaking to at any given point. This is exacerbated by non-LARS units providing ATSOCAS and the BS provision by London/Scottish Information.*

   d. *BS is not included in LARS.*

   e. *LARS availability is limited when GA most need it, i.e. weekends.*

   f. *Inconsistent LARS availability hours.*

   g. *Information and education regarding LARS is lacking.*

   h. *Overlapping but disjointed responsibilities and coverage of London/Scottish Information and the LARS system.*

   i. *The Statement of Requirement requires re-writing and updating and is not contractually assured.*

   j. *There isn't a formal mechanism for feeding back information on LARS to the CAA from aircraft operators.*

2. From this list the 2013 Review formed 3 options and several generic changes which are summarised or copied below.

Options

3. Option 1 – Do Nothing. This was not recommended owing to issues raised with the current system listed above.

4. Option 2 – Introduce a phased change of LARS ATSUs in an attempt to increase geographical and time coverage whilst not increasing finances. This required abating payments for some units and contractually obligating others to provide longer service provision and an acceptance of prime liability for LARS in their area of responsibility. This also required a re-banding of remuneration based on hours of service provision, and does not take into account the amount of traffic worked as per the existing system. In sum this option saw the removal of RAFs Coningsby, Leeming, Lossiemouth and Marham; RNASs Culdrose and Yeovilton; Plymouth Military and MoD Boscombe Down. These units were replaced by the introduction of Inverness, Glasgow, Aberdeen and RAF Wittering; and saw a new airspace sharing arrangement between BAe Warton and Blackpool.

5. Option 3 – Combine LARS with Scottish/London Information as both provide UK FIS within the UK airspace but are not unified.

Generic Changes

6. Basic Service – This is included as part of LARS and the service is renamed to Lower Airspace Air Traffic Service (LAATS).

7. Collection of Statistics – Units continue to provide monthly returns on the number of services provided, including BS, and the number of occasions and reasons when a service is refused. These statistics are used for audit purposes.

8. Charting – The AIP chart is a simplistic map of ATSU areas of coverage which does not take into account actual radar coverage, airspace reservations or controlled airspace, delineation of coverage subject to MoU/LoA between ATSUs where there is significant overlap. This is reflected on half Mil and quarter Mil Navigation Charts and therefore leads to confusion about who pilots should actually call. It was recommended that these are amended.

9. Financial Support for Education – It was recommended that £10,000 per annum is set aside from the LARS budget to organise Fly-ins, talks and host visits in order to build contacts and 'de-mystify' ATM, particularly during the change process.

10. Feedback – It was recommended that a formal mechanism is established to enable pilots and aircraft operators to feedback information on the performance of LARS ATSUs. This should be done on an annual basis via NATMAC in November to allow the CAA to make any adjustments to LARS at the beginning of the financial year.

2013 Recommendations

11. The 2013 Review made several recommendations. These were not based on a single option provided, but looked to combine Options 2 and 3 and include all of the generic changes, except for the collection of statistics which required no change. These are copied below.

During FY14/15 the following changes are made.

a. *The Following ATSUs are released from the LARS system:*
   RAF Lossiemouth, RAF Leeming, RAF Coningsby, Plymouth Military Radar, RNAS Culdrose,

b. *The following ATSUs are invited to join the system:*
   Inverness International Airport, Aberdeen International Airport, Glasgow International Airport, RAF Wittering. (Informal discussions have taken place with NATS/Inverness)

During FY15/16 the following changes are made:

c. *The following ATSU's are released from the LARS system;*
   RAF Boscombe Down, RNAS Yeovilton.

d. *In the longer term investigate combining the service provision of the LARS and FIS systems along with their joint funding.*

e. *LARS Statement of Requirement re-written as a Provision of Service agreement between CAA SARG and the individual ATSU and reviewed by CAA Legal to commence on 1 Apr 14. Draft attached.*

f. BS included in the Service Provision and consequently LARS to be renamed Lower Airspace Air Traffic Service (LAATS) from 1 Apr 14.

g. Funding banding and coverage hours rationalised and used as the basis for payments and not aircraft movements. This will split into two Bands to be implemented on 1 Apr 14, namely;

A-7 days a week, 10 hours a day between 0800-2100 as required (70 Hours)

B-5 days a week, 0900-1700

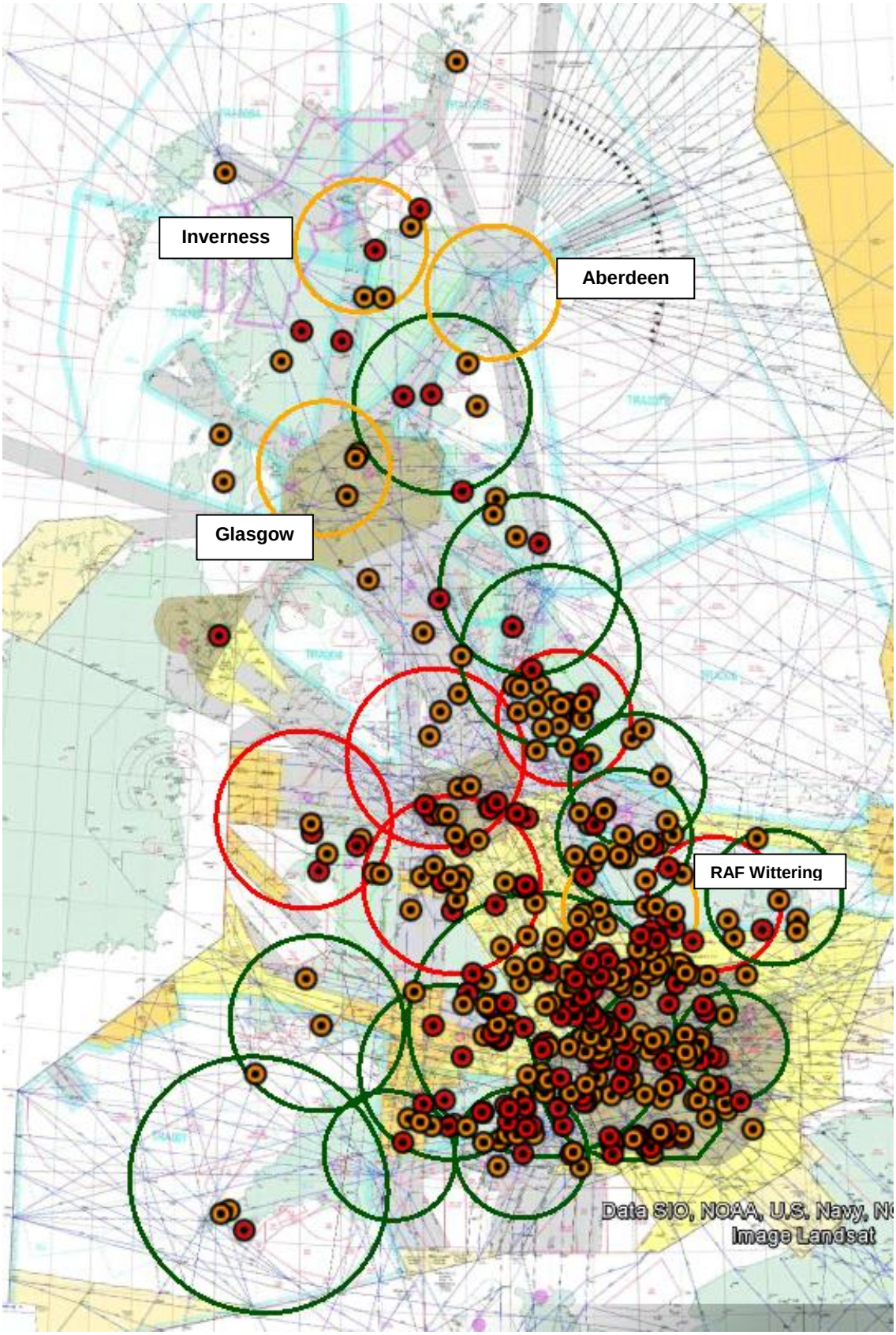
h. UK AIP ENR 1.6.3 updated to reflect all changes and coverage map to more accurately reflect individual ATSU actual service provision area.

i. Half Mil and Quarter Mil Navigation Charts to be reviewed to more accurately represent LARS Units coverage.

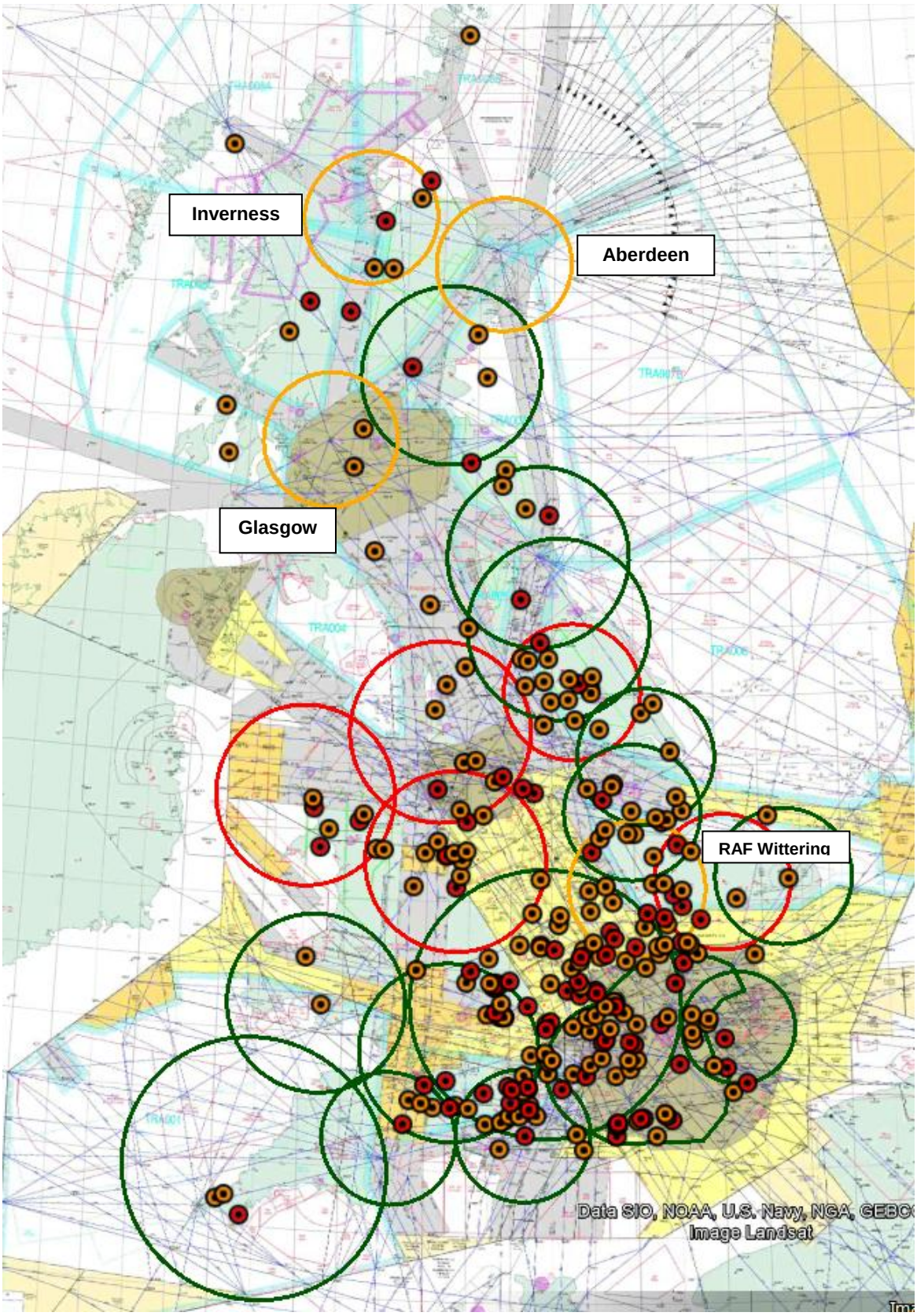
j. Provide financial support to LAATS ATSUs to host GA Fly-ins and Flying Club talks etc, in order to advertise the system and further the understanding of ATSOCAS. The money to be set aside from LAATS Funding and made available from 1 Apr 14.

k. A formal method of feedback is instigated, via the NATMAC, on LARS (LAATS) issues. Primarily this should include through the LAA, AOPA, GASCO etc. and on a yearly basis commencing at the Autumn NATMAC 14.

2013 LARS Review Recommended LARS Units Showing Airprox Cat A and B



2013 LARS Review Recommended LARS Units Showing Week Day Airprox Cat A and B



2013 LARS Review Recommended LARS Units Showing Weekend Airprox Cat A and B