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Audit of Service Quality Regulation at Heathrow Airport Limited

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Documents

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Glossary

ACT	Aerodrome Congestion Term
AOC	Airline Operators Committee
ASQ	Airport Service Quality
AQM	Automatic Queue Measurement (Little's Law)
ASS	Airline Service Standards
BT	Bluetooth
BQM	Barcode Recognition System
CAA	Civil Aviation Authority
CC	Competition Commission
CAA12	Civil Aviation Act 2012
CSS	Core Service Standards
CSS(R)	Core Service Standards
FEGP	Fixed Electrical Ground Power
GAL	Gatwick Airport Limited
HAL	Heathrow Airport Limited
IDAHO	Integrated Database for Air Handling Operations
OPM	Operational Performance Monitoring
QSM	Quality Service Monitor
RfQ	Request for Quotation
SEG	Stand Entry Guidance
SQRB	Service Quality Rebate and Bonus Scheme
TTS	Track Transit System
WTMD	Walk Through Metal Detector

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1 Background and scope

1.1 Background

Heathrow Airport Limited (HAL) and Gatwick Airport Limited (GAL) are each subject to service quality regulation by which they issue rebates to airlines who pay the airport's aeronautical charges in situations where certain standards are not reached. These standards apply to a range of directly measurable elements that reflect the passenger experience at HAL and GAL.

In 2003, the Scheme of Standards and Rebates (the Scheme) was first introduced as part of the five-yearly regulatory reviews. It followed a public interest finding by the then Competition Commission (CC) that charges did not reflect differences in quality to the extent that would occur in a competitive market. In 2008, the Scheme was extended and modified following a further public interest finding by the CC in its 2007 report to the CAA.

For HAL, the legal basis for the Scheme are the conditions in HAL's economic licence, granted on 13 February 2014 under the Civil Aviation Act 2012 (CAA12). The Scheme is defined in greater detail in the CAA's recent (April 2014) Q6 regulatory decisions for Heathrow Airport.

For GAL, the legal basis is the conditions of GAL's economic licence granted on 13 February 2014 under CAA12. GAL's licence incorporates a number of commitments made by GAL on (amongst other things) price and service quality (the Commitments) which are set out in GAL's Conditions of Use. GAL's service quality regime incorporates the Core Service Standards (CSS) and Airline Service Standards (ASS), and is defined in Schedule 3, Appendix II of the Conditions of Use, forming part of the Commitments. The Airline Service Standards place obligations on

third parties (airlines), and thus are not conditions of the Licence. While the CAA has no powers to modify or enforce the Airline Service Standards, we have reviewed these standards as part of CAA's general monitoring obligations.

When the CAA conducted service quality audits in 2009 and 2010, both HAL and GAL were subject to very similar service quality regimes. Since Q6 began, in light of the changes to the form of regulation at Gatwick Airport, there has been a divergence of the service quality regime at Heathrow and Gatwick airports.

Under the CAA12, the CAA has a primary duty to further the interests of users of air transport services. On-going monitoring of airport services, in the form of periodic audits, is important to ensure that the service quality regulation in place continues to achieve its intended purposes and to safeguard the passenger interest. Therefore Grant Thornton was engaged to conduct audits of service quality at both HAL and GAL on behalf of the CAA. The results of this audit will be used to assist in further development of service quality regimes at both HAL and GAL.

1.2 Scope

The objectives of this audit were as follows:

- To provide a transparent, independent assessment of whether performance against standards has been measured and reported as intended in the CAA's service quality regulation
- To assess whether best practice has been followed in the documentation of processes
- To review the accuracy and reliability of the calculation of bonuses (where applicable) and rebates, both under normal circumstances and when service quality exclusions apply
- To determine whether HAL's and GAL's interpretation of the licence conditions and the CAA's determination on HAL's service quality protocol are in line with the CAA's interpretation
- To provide objective, unbiased, reliable and robust information on which the CAA can base regulatory financial incentives.

In conducting our audit, we reviewed the key processes relating to the following service standards for HAL (which we evaluated on a sample basis in terms of testing):

- Licence granted under the Civil Aviation Act 2012 (Heathrow_licence_5_May_2015)
- HAL Q6 SQ determination
- Service Quality Protocol – Briefing Document (Final Draft)

The following service elements were assessed as part of our audit:

Component	Service Element	Element Metric	Target Result	Terminals measured
Passenger Satisfaction	Departure Lounge Seating Availability	Moving annual average QSM scores weighted by monthly passenger numbers	3.80	All
	Cleanliness		4.00	All
	Way-finding		4.10	All
	Flight Information		4.30	All
	Security		Publication only	All
	Wi-fi		Publication only	All
Security & Control Posts	Central Search (Interim)	Percentage of queue times measured once every 15 minutes that are less than 5 minutes.	95.00%	All
		Percentage of queue times measured once every 15 minutes that are less than 10 minutes.	99.00%	All
	Transfer Search (interim)	Percentage of queue times measured once every 15 minutes that are less than 10 minutes.	95.00%	All
	Staff Search	Percentage of queue times measured once every 15 minutes that are less than 10 minutes.	95.00%	All
	Control Posts CTA: CP5, CP8	Percentage of vehicle queue times measured once every 15 minutes that are less than 15 minutes at each of the control post groups.	95.00%	N/A
	Cargo: CP10, CP10a, CP25a		95.00%	N/A
	Eastside: CP14*, CP16		95.00%	N/A
	Southside: CP24		95.00%	N/A
	Terminal 5: CP18, CP19, CP20		95.00%	N/A
	PSE (General)	% Time serviceable and available for use, independent of any other element	99.00%	All
Passenger Operational and Airline Operational Elements	PSE (Priority)		99.00%	All
	Arrivals Baggage Carousels		99.00%	All
	Track transit		99.00%	5

Component	Service Element	Element Metric	Target Result	Terminals measured
	system	serviceable and available for use		
		% Two trains serviceable and available for use	97.00%	5
	Stands	% Time serviceable and available for use, independent of any other element	99.00%	All
	Jetties		99.00%	All
	Fixed Electrical Ground Power (FEGP)		99.00%	All
	Stand Entry Guidance (SEGs)		99.00%	All
	Pre-conditioned Air (PCA)		98.00%	2, 3 & 5
	Pier-served Stand Usage	Moving annual average of % passengers served (last 12 months)	95.00%	N/A

*Control Post 14 is no longer in operation

In addition we assessed the Aerodrome Congestion Term (ACT), bonus and publication requirements.

Note: there are some proposed service element changes that have not become effective yet they are documented below.

Component	Service Element	Element Metric	Target Result
Security & Control Posts	Central Search	Percentage of passengers queuing less than 10 minutes	99.00%
	Transfer Search		99.00%
	Central Search	Delivery of automated security queue measurement by a date agreed by Heathrow Airport and the Airline Community	By a date agreed by Heathrow Airport and the Airline community
	Transfer Search		

Our review included the detailed scope of work outlined above and included within the Civil Aviation Authority's Request for Quotation (RfQ) detailed under Appendix A only, and did not include any other areas.

1.3 Limitations of Scope

Because of the inherent limitations of any internal control structure and the scope and resources limitations of any assurance activity, it is possible that errors or irregularities may occur and not be detected. The matters raised in this report are only those which came to our attention during the course of performing our procedures and are not necessarily a comprehensive statement of all the weaknesses that exist or improvements that might be made.

Our work is performed on a sample basis; we cannot, in practice, examine every activity and procedure, nor can we be a substitute for management's responsibility to maintain adequate controls over all levels of operations and their responsibility to prevent and detect irregularities, including fraud.

Any projection of the evaluation of the control procedures to future periods is subject to the risk that the systems may become inadequate because of changes in conditions, or that the degree of compliance with them may deteriorate. Recommendations and suggestions for improvement should be assessed by management for their full commercial impact before they are implemented.

We believe that the statements made in this report are accurate, but no warranty of completeness, accuracy, or reliability is given in relation to the statements and representations made by, and the information and documentation provided the CAA, HAL or GAL. We have not attempted to verify these sources independently unless otherwise noted within the report.

During the course of our work there specific testing limitations, as outlined in section two below.

1.4 Acknowledgement

We would like to take this opportunity to thank the people involved in for their co-operation during this review.

2 Executive summary

2.1 Heathrow Airport Limited

The following table summarises the key observations identified during our review against each of the audit requirements included in the Civil Aviation Authority's Request for Quotation. Key observations have been summarised separately for HAL. We have categorised the observations from our review into the following areas:

- Detailed findings – observations that have a direct, or potentially direct, impact on service performance scores, and associated rebates, reported by HAL
- Future considerations (service standard specific) – observations which relate to the content, and interpretation, of the service standards. This includes instances where the service standards are not clear, areas where the service standards could be updated, or issues regarding the interpretation of the service standard by HAL
- Future considerations (airline operational processes) – observations which relate to the way service performance is measured, quality assured and reported by HAL.

Key Themes

On the whole our audit (and targeted testing) identified that SQRB data is being mainly collated, analysed and accurately reported (based on scope of our testing) in line with the requirements outlined in the Licence granted to HAL under the Civil Aviation Act 2012. For context, it is important to acknowledge that the way the service standards regime is set up does allow for certain level of discretion and judgement on how measurements are undertaken in respect of each service standards.

Discussions with the key stakeholders from HAL, the AOC and CAA during the course of this audit identified that there is perception of a lack of transparency and confidence in the way service standards are implemented, specifically the methods (e.g. what, when, how and why) by which measurements are made. It is suggested that an increased level of transparency be introduced to provide greater comfort to the AOC and airlines that adequately designed internal processes are in place (and which are updated in an appropriate way to account for changes in technology, infrastructure and other factors) and followed to calculate the SQRB results. Below we have detailed some examples of improvements to the current SQRB scheme processes to provide greater transparency:

- Provision of monthly scan rate reporting supporting the T5 central security queue calculation which would demonstrate whether adequate coverage of passengers was considered in calculating queue times.
- Increased level of transparency for the AOC and other stakeholders surrounding automatic exclusions applied for by HAL.
- The development of an industry definition for capital works to provide guidance of when capital works exclusions can be applied for.
- Enhancements to the governance structures in place to monitor the request and approval of exclusions (i.e. increased involvement from CAA to oversee the governance structure).

An improvement to the transparency will provide comfort that the intended design of the service quality measurements to improve the passenger experience in the airport is being achieved, and that the minimum level of service to airlines is being achieved.

In addition, our audit further identified a number of enhancements that HAL should consider to ensure that sufficient data is captured and adequately analysed to provide a suitable assessment on HAL's performance against the components of the SQRB scheme. Examples of enhancements identified are noted below:

- Increased coverage of QSM surveys to assess the passenger satisfaction (i.e. offering QSM in other languages and inclusion of half completed surveys in the monthly results).
- Improve spreadsheet controls for documents used in the calculation of the monthly SQRB results.
- Introduction of quality assurance activities to monitor the performance of third party providers who assist collate and analyse SQRB results on behalf of HAL.
- Removing fast track security queue times recorded in T5 from the central security queue time calculation to ensure they are not have a distorting effect on security queue measurements.

Further, our audit identified some issues surrounding the current method of collation and analysis of data which could potentially impact the accuracy of the SQRB results reported.

- The exclusion of passengers who enter the T5 north security queue from the T5 central security calculation.
- Unavailability of CCTV footage to assist recording of the staff and T5 transfer security queue times.

Our audit identified several minor variances between the reported service elements results and the supporting documentation in place to substantiate the result. Minor variances were identified for the following service quality components: • Passenger satisfaction • Security and control posts • Asset availability We have set out a number of recommendations for HAL to enhance the current operational procedures to minimise the risks of errors in the collation and analysis of SQRB results. Further we have provided a number of considerations with regards to the design of the SQRB scheme for the consideration of the CAA, HAL and the AOC for future reiterations of the SQRB scheme.	
Passenger Satisfaction	
Audit observation	Reference
Audit requirement Give an objective opinion on whether QSM has been consistently applied according to the licence over time and across terminals based on: • whether the current methodology and application is transparent • whether any changes to update the procedures are well documented with an audit trail and have not in the opinion of the Auditors materially affected the comparability of the results compared to the benchmarks set when the scheme was set up.	
The methodology for conducting the QSM is transparent in that there has been no changes to the QSM process since it was documented and established in April 2014. Should any changes to the methodology be requested, the process is that those changes would need to be agreed between the AOC and HAL. Any changes to the content would then be executed by Epinion (who are a third party engaged to execute surveys and cleanse survey data for HAL). The QSM process has been consistently adopted across the audit period (April 2014 – December 2015). Detailed findings • We identified a number of discrepancies between the passenger satisfaction element scores as per the published results and the supporting documentation in place. Discrepancies occurred as a result of input errors, formula errors or changes to the calculation methodology. These issues in our selected sample were relatively minor in nature and did not have any impact upon rebate calculations. Considerations for the future Airport operational processes • Our audit identified key spreadsheets used in the calculation of the QSM monthly service element scores which could benefit from improved spreadsheet controls (such as the locking down of formula and password protection). • We were unable to evidence any management themselves undertaking independent review of results. HAL may wish to enhance the quality assurance of QSM data by performing a review of preliminary QSM results as part of the process.	Detailed findings 6.3 Considerations for the future Airport operational processes 7.2C 7.2K

Audit requirement Review whether in the opinion of the Auditor the methodology and application of the QSM reasonably accord with best market practice and are sufficiently objective, unbiased, reliable and robust to be fit for the purpose of supporting elements of the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport and if not how the QSM could be amended to make it appropriate, and in particular: - whether sample sizes are statistically adequate to support results to the level of confidence required - whether the survey questions and processes are well designed to obtain a high quality response taking into account the wide range of passengers involved e.g. UK originating/other end originating/connecting passengers; business/leisure etc., language and cultural differences; male/female - whether the samples of passengers and weighting adequately reflect the overall mix of passengers - to what extent any changes designed to overcome concerns about the methodology and application would adversely affect the benefits of consistency.	
Audit observation	Reference
There is a clear methodology in place to create sample sizes and quotas that are representative of the passenger traffic throughout Heathrow's terminals. The survey questions are designed to focus on key passenger experiences throughout the terminals and took into consideration a wide range of passengers with differing demographics. We have not raised any findings in relation to this service area. However, our audit did identify some considerations for both the CAA and HAL going forward which could further enhance the coverage and transparency of QSM surveys. Considerations for the future Service standard specific - QSM surveys are only currently provided in English, there may be an opportunity to provide additional languages and access more feedback. - The current design of the SQRB does not include any measurement of the passenger transfer experience through HAL terminals - The SQRB related attributes within the QSM are not currently subject to periodic review to assess the appropriateness of the service areas assessed. - There is a number of passenger satisfaction experiences that are not considered within the SQRB elements of the QSM (for example, availability of baggage carts). - The current methodology for surveying departing passengers presents challenges to capture business passengers who are located in business lounges until the time of boarding the flight. The SQRB should be updated to clearly state whether business passengers are within, or excluded, from the scope of QSM surveys. - Whether the current survey population (0.0004%) of passengers travelling through Heathrow is the most appropriate benchmark. Airport operational processes - QSM surveys may not always be completed at the most ideal locations to capture the passenger experience at a point in time. (i.e. the passenger's security experience is not captured until the passenger is at the departure gates which is well after the passenger has gone through the security area). - At present any QSM survey that is incomplete will not be included within the calculation of the overall QSM results for arrivals and departures. However, these may provide valuable insights.	Considerations for the future Service standard specific 7.1A – 7.1G Airport operational processes 7.2A 7.2B
Audit requirement Report on whether there are more effective, accurate or robust measures of service performance, including (where appropriate) suggesting proven systems that are used at other airports.	
Audit observation	Reference
N/A – Refer to analysis in other sections above	N/A

Audit requirement

The audit shall also compare the results of the QSM to international surveys of airport quality performance (particularly the Airport Service Quality (ASQ) survey conducted by Airports Council International), and identify any apparent anomalies in movements over time and offer any possible explanations.

Audit observation**Reference**

Our audit compared results from the QSM and the ASQ survey in 2015 to understand whether there was an apparent anomalies.

Whilst both surveys differ in the passenger experience questions that are delivered we were able to complete analysis for a number of the service element sub elements i.e. departure toilet cleanliness, way finding for departures.

During 2015 there were minor variances in the results between the two surveys with the QSM survey results marginally higher than the ASQ. Below is a summary of the survey results which were able to be compared.

Element	Sub Element	QSM (2015 average)	ASQ (2015 average)
Cleanliness	Departure Toilets	4.20	4.01
Cleanliness	Departure Lounge	4.33	4.27
Wayfinding	Departure	4.25	4.13
Flight Information	Finding	4.42	4.19

It should be noted that the ASQ survey has a different methodology to the QSM and therefore is assessed in a different means presenting challenges in comparing results. The rating scale for the ASQ is (asymmetrical) therefore results in the ASQ will be lower than the equivalent results in the QSM.

The review of the results did not identify any outlying anomalies, however it would be suggested that in the future that similar benchmarking is conducted by HAL to determine whether the QSM is fit for purpose.

N/A

Security and Control Posts	
Audit requirement The audit shall focus on these security elements in the SQRB scheme at Heathrow Airport: Central search, Transfer search, Staff search, Control posts (CTA, Cargo, Eastside, Southside, Terminal 5). The audit shall focus on these security elements in the CSS (R) scheme at Gatwick Airport: Central passenger search, Transfer search, Staff search (Terminals and Crew), External control posts search. The robustness of the current queue measurement systems and procedures in each terminal and their fitness for purpose in providing the source data for the SQRB scheme at Heathrow Airport and in the CSS (R) scheme at Gatwick Airport, including within this assessment the questions that have been raised regarding the consistent measurement of the end of passenger security queues.	
Audit observation	Reference
Our audit identified that whilst there is a number of differing measures for capturing the security and control post queue times, on the whole all measurements are being accurately and appropriately applied. Our review however did identify a number of minor variances between the reported scores and supporting calculations several considerations for the future to further enhance the measurement of the queue times at Heathrow. Detailed findings - The T5 security queue measurement calculation does not include the passengers who enter the security area at the north premium queue. - CCTV footage is not consistently retained across HAL. During our review we identified that CCTV cameras are not always located in adequate locations to assist accurate capturing of queue times for staff searches. In addition, our audit identified a discrepancy between the reported queue time as recorded by Wilson James (third party who assist HAL record queue times for staff search and T5 transfers) and the actual queue time as per the CCTV footage. - Footage of manual overrides to control post queue times was unable to be substantiated against CCTV footage as footage was not retained. - We found minor discrepancies between central search, transfer search and staff search security service element scores as per the published results and the supporting documentation in place. Discrepancies occurred as a result of either manual input errors, delayed input of manual overrides or T5 transfer hold times not included in queue time calculations. - Our audit further identified minor discrepancies between the control post service element scores as per the published results and the supporting documentation in place. Discrepancies were in the main attributed to data storage issues in OPM, archiving issues as well as manual input errors. Considerations for the future Service standard specific - Fast track security is currently included within the central security queue calculation which could lead to queue times captured that are not representative of the average queue time per passenger. - The design of the barcode recognition measurement (BQM) for measuring security queues presents the potential for results to be manipulated as it relies on passengers to elect to scan their boarding pass. - There are currently no exclusions available for control post queue times. Under the current SQRB scheme HAL is penalised when vehicles breakdown in control post lanes causing failures, where the cause of the breakdown is outside the control of HAL. Airport operational processes - At present there is no form of quality assurance completed on the security queue times captured by Wilson James. - The process for recording manual override queue times for central, staff and transfer search differ to that for control posts. In our view, these should be standardised. - At present CCTV footage to assist substantiate security and control post queue times throughout Heathrow is either not available (in some	Detailed findings 6.1 6.2 6.5 6.6 6.7 Considerations for the future Service standard specific 7.1H 7.1J 7.1K Airport operational processes 7.2E 7.2F 7.2G 7.2K

locations) or only retained for 30 to 90 days. We were unable to obtain any evidence of an independent review conducted on the preliminary results for security and control posts. HAL should review preliminary results and retain evidence thereof.	
Audit requirement Whether the current grouping of control posts at Heathrow Airport is (i) balanced in terms of usage, (ii) reasonable in terms of substitutability of individual control posts, and (iii) able to maintain incentives on HAL to maintain control post performance levels across the campus in order to meet the operational needs of the airlines/passengers.	
Audit observation	Reference
As part of our audit we conducted an analysis of the current grouping of control posts based on traffic per lane for each control post. Our analysis identified that the current control post groupings have fluctuation variances with regard to the usage however do appear to provide HAL with incentives to maintain the performance levels across the campus to accommodate the operational needs of the airlines/passengers. Whilst variances do exist surrounding the usage of control post groupings we recognise that the requirement for airlines to access airside for operational purposes must be considered when analysing whether control post groupings are appropriately apportioned. Our audit identified some potential considerations surrounding the design of control post groupings as noted below. Considerations for the future Service standard specific Control post groupings should be subject to periodic review based on a range of factors such as the amount of vehicle traffic, lanes available and the airside operational requirements, to ensure the groupings are appropriately allocated.	Considerations for the future Service standard specific 7.11
Audit requirement Whether there are more effective, accurate and robust measures of service performance, including (where appropriate) suggesting proven systems that are used at other airports.	
Audit observation	Reference
N/A – Refer to analysis in other sections above.	N/A

Passenger Operational and Airline Operational Elements	
Audit requirement The audit will consider the procedures and systems for measuring availability of the assets set out in the SQRB scheme at Heathrow Airport. This includes the following aspects: Passenger sensitive equipment (general), Passenger sensitive equipment (priority), Arrivals baggage carousels, Tracktransit system, Stands, Jetties, Fixed electrical ground power, Stand entry guidance, Pre-conditioned air, Pier-served stand usage. The audit will consider the procedures and systems for measuring availability of the assets set out in the CSS(R) scheme at Gatwick Airport. This includes the following aspects: Passenger sensitive equipment (general), Passenger sensitive equipment (priority), Arrivals reclaim, Inter-terminal shuttle system, Outbound baggage, Stands, Jetties, Pier service, Fixed electrical ground power. The audit shall give an objective opinion on: - whether the procedures and systems in each terminal are fit for purpose - whether they are transparent, well documented and have been consistently applied - whether the application of the processes by which specific assets are excluded from the scheme when service quality exclusions apply (e.g. planned maintenance) have been consistent with the specification in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport - whether there are more effective, accurate or robust measures of service performance in this area, including (where appropriate) suggesting proven systems that are used at other airports.	
Audit observation	Reference
On the whole our audit was able to identify procedures in place to capture and calculate the monthly asset availability SQRB results. Whilst the methodology for calculating the results is transparent, we did identify that there is inconsistent methods adopted for capture and calculate the asset availability scores for differing assets. Whilst the circumstances for when service quality exclusions are able to be requested are clearly documented, there are differing documentation requirements for different exclusions. Exclusions will either require documented approval from the AOC, evidence of consultation with the AOC, or no evidence at all. Without considerable quality assurance controls in place surrounding exclusions where consultation or no approval is required there is a reduced level of confidence on the validity of such exclusions. Our audit identified some minor discrepancies between the SQRB scores reported and the supporting documentation and several considerations for the future to enhance the transparency and accuracy of SQRB calculations and further enhance the recording of asset availability measures at Heathrow. Detailed findings - Our audit identified minor discrepancies between the stand availability, arrivals baggage carousel and tracktransit system (TTS) element score. Discrepancies occurred due to either formulae errors contained within spreadsheets used for calculation or manual input errors. Considerations for the future Service standard specific - The arrivals baggage carousel service element has no consideration to whether the baggage is placed on the arrivals baggage carousel with due care and in a timely manner. - Exclusions are available for major refurbishment work, however there is no definition as to what constitutes major refurbishment work. - There is a lack of oversight/challenge built into the governance structures surrounding automatic SQRB exclusion requests and lack of clarity as to how consultation for approvals is evidenced. Further there is a perception of a lack of confidence in the way service standards are implemented between the AOC and HAL with regard to the appropriateness of exclusions raised and approved. Airport operational processes	Detailed findings 6.4 6.8 Considerations for the future Service standard specific 7.1F 7.1M 7.1N Airport operational processes 7.2C 7.2H 7.2I 7.2J 7.2K 7.2L 7.2M

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Airport operational processes

- Our audit identified key spreadsheets used in the calculation of the asset availability monthly service element scores which could benefit from improved spreadsheet controls (such as locking down of formula and/or password protection).
- Whilst the majority of all assets downtime is captured via Maximo in a consistent manner, our audit identified an inconsistent approach for calculating the asset availability percentage.
- Whilst it is understood that in some circumstances there is no requirement for an automatic exclusion to obtain approval, our audit identified that a lack of transparency exists surrounding automatic exclusions.
- We were unable to evidence quality assurance checks were conducted on several work orders to validate asset downtime orders were accurately recorded as end product check documentation was not available.
- With the exception of stand availability, we were unable to obtain any evidence of an independent review on the preliminary results for asset availability calculations.
- There is currently no quality assurance activities completed on work orders undertaken by contractors.
- Our audit also identified several variances between the asset downtime as per the monthly supporting calculation and the downtime recorded within Maximo (HALs enterprise management system)

Aerodrome Congestion	
Audit requirement The audit shall give an objective opinion on: - whether the data collection and communication have been performed subject to adequate processes and procedures to ensure that they are accurate and complete - whether the airport has reasonably identified the full list of "material events" as defined in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport - whether the airport has reasonably identified the full list of such events with a "material operational impact" as defined in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport - whether the airport has reasonably applied the "exceptions" as defined in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport.	
Audit observation	Reference
HAL maintains a Super Log which captures all potential material events that occur each day. The classification of material events is managed by the Aircraft Flow Manager. The Licence provides guidance on what is considered a 'material event' and 'material operational impact'. All material events and results of calculation of the material operational impact will be reviewed on a bi-monthly basis by the ACT Working Group. The working group consists of stakeholders from the AOC, NATS and HAL (operational staff). Whilst there is clear guidance and governance in place to assist the classification of material events and calculation of material operational impact we identified some non-conformance to licence requirements and some areas for improvement in the calculation of ACT scores to consider for the future. Considerations for the future Service standard specific - The licence details a requirement for data collection and communication with regards to ACT that is not currently being followed in practice by HAL. We identified however that adequate visibility is provided to all key stakeholders via other communication channels. Airport operational processes - Our audit identified key spreadsheets used in the calculation of the ACT monthly service element scores which could benefit from improved spreadsheet controls.	Considerations for the future Service standard specific 7.1O Airport operational processes 7.2C

Audit requirement Whether in the opinion of the Auditor the airport operator has: - made reasonable assumptions about the number of expected arrivals and/or departures during material events with a material operational impact - the airport operator has made reasonable judgements based upon explicit criteria where there have been contributing causes beyond its control.	
Audit observation	Reference
Aerodrome congestion is calculated using a spreadsheet which captures actual which captures the actual and expected arrivals and departures using an eight week average. We were able to evidence that the current methodology for calculating the expected arrivals and departures was being appropriately applied. In addition, there is set criteria documenting what constitutes a material event to assist determine whether an event has been caused beyond its control. HAL has identified that the methodology for calculating the ACT during the audit period may not have been the most accurate method available. HAL has therefore invested in creating a new methodology for calculating the expected arrivals and departure time which uses historic data to provide more accurate results. Considerations for the future Airport operational processes Whilst it is recognised that HAL has developed a new methodology for calculating the expected arrivals and departures to assist with ACT calculations, HAL should ensure that the new method includes all variables that could impact expected arrivals/departures.	Considerations for the future Airport operational processes 7.2D
Audit requirement Whether subject to the above the rebates have been properly calculated.	
Audit observation	Reference
Refer to the rebates section below.	N/A
Audit requirement Whether there are more effective, accurate or robust measures of service performance, including (where appropriate) suggesting proven systems that are used at other airports.	
Audit observation	Reference
As noted above, we support HAL's new methodology to calculate the ACT by eliminating manual entry of monthly results and where possible automating data collection and calculation.	N/A
Audit requirement As part of the above assessment, the Auditors will investigate and report on the transparency of the decision-making process for the operation of this measure, and on the extent to which the views of stakeholders are appropriately captured and considered.	
Audit observation	Reference
Classification of events regarding aerodrome congestion are made by the Aircraft Flow Manager. The classification of material events and the calculation of the expected and actual arrivals and departures is reviewed by the ACT Working Group consisting of key stakeholders across Heathrow i.e. NATS, AOC, HAL (operational staff).	N/A

Airline Service Standards (Gatwick Airport only)	
Audit requirement	
The effectiveness of the monitoring of arrivals bag performance, in particular the robustness of data collection and calculation of airline performance.	
Audit observation	Reference
N/A – GAL specific requirement.	N/A
Audit requirement	
The provision of adequate information to airlines and to the CAA on the amounts paid and the dates of payments.	
Audit Observations	Reference
N/A – GAL specific requirement.	N/A

Calculation and Payment of Bonuses (Heathrow Airport only) and Rebates	
Audit requirement The robustness of the calculations of bonuses (Heathrow Airport only) and rebates, including the consistent rounding of figures to the appropriate number of decimal points.	
Audit observation	Reference
Bonuses and rebates are calculated using a spreadsheet that includes the performance of each service element for each month, broken down by terminal. Rebate and bonuses calculations applied by this spreadsheet align with the requirements as per HALs licence. An annual rebate wash-up calculation is conducted at year end to reflect any variations between estimated and actual aerodrome charges and airline use. We identified some minor variances surrounding the rounding of decimal points for service element scores input in the rebate calculation module which are explained in the above service element categories.	N/A
Audit requirement The robustness of the calculations of rebate reduction due to airlines not meeting the airline service standards (Gatwick Airport only).	
Audit observation	Reference
N/A – GAL specific requirement.	N/A
Audit requirement The provision of adequate information to airlines and to the CAA on the amounts of rebates paid by HAL and GAL, the bonuses earned by HAL, the amount of rebate reduction (Gatwick Airport only), and dates of payments.	
Audit observation	Reference
A summary of the rebates paid and bonuses received are presented within the monthly SQRB results on the HAL website. In addition the monthly results are displayed within all Heathrow terminals and updated on a monthly rolling basis. In addition the rebates paid and bonuses received are detailed within the regulatory accounts which are accessible on the HALs website.	N/A
Publication of Service Performance	
Audit requirement The audit shall give an objective opinion on the publication of performance, and (where appropriate) make suggestions for possible ways of improving transparency of information to passengers and other airlines.	
Audit observation	Reference
We were able to evidence that service performance results have been published on both the HAL website and within HALs audited regulatory accounts. As part of our audit, we conducted testing over the accuracy and completeness of published service performance information on HALs website. We identified several minor variances between the reported results and the results published which are explained in the above service element categories.	N/A

1.	Background and scope
2.	Executive Summary
3.	Findings
	Appendices

Limitations

During our work we were unable to verify the following service elements or airport operational activities due to limitations in CCTV footage available:

- The accuracy of start and finish times of work orders raised to record planned/routine maintenance and ad hoc/reactive maintenance for assets covered by the asset availability measures. This is due to CCTV footage only being retained for a 30 day period. This impacted our ability to independently assess whether asset downtime for each asset had been accurately recorded by engineers and contractors at Heathrow.
- The accuracy of manually recorded security queue times (for central security, transfers, staff, and external control posts) over the period April 2014 – December 2015. This is due to CCTV footage only being retained for a 30 day period. This impacted our ability to independently assess whether security queue times had been accurately recorded by Wilson James, the third party contracted by Heathrow to record security queues.

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3 Summary of Key Findings

The following table below provides a summary of the detailed findings ratings and considerations for the future for each service component for HAL.

Component	Detailed Findings			Future Considerations	
	High	Medium	Low	Service Standard Specific	Airline Operational Processes
Passenger Satisfaction	-	1	-	7	4
Security & Control Posts	2	3	-	4	4
Passenger Operational & Airline Operational Elements	-	1	1	3	7
Aerodrome Congestion	-	-	-	1	2
Airline Service Standards(Gatwick only)	N/A	N/A	N/A	N/A	N/A
Calculation & Payment of Bonuses (Heathrow only) & Rebates	-	-	-	-	-
Publication of Service Performance	-	-	-	-	-
Total	2	5	1	15	17

Within our reports, every finding is given a rating providing a high level view of the adequacy of the internal control environment. These ratings are described in the tables below. This rating system allows for objective monitoring and comparison of reports and further provides indication to the level of control weaknesses in place. Whilst we have documented some of the key features below as a guide towards the rating provided this list is not comprehensive and other factors may have been taken into consideration. The below table provides example features which are considered when providing ratings to our findings throughout this report.

Finding rating	Description	Potential Rating Features	Service Standard Audit Commentary
High	Findings that are fundamental to the management of risk in the business area, representing a weakness in control that requires the immediate attention of management	- Key control not designed or operating effectively - Potential for fraud identified - Non-compliance with key procedures/ standards - Non-compliance with regulation	In the context of our audit, we typically identified that high priority findings were of a nature where controls were not designed appropriately and/or not working effectively in practice.
Medium	Important findings that are to be resolved by line management.	- Impact is contained within the department and compensating controls would detect errors - Possibility for fraud exists - Control failures identified but not in key controls - Non-compliance with procedures/ standards (but not resulting in key control failure)	In the context of our audit, we typically identified that medium priority findings were of a nature where enhancement were identified to the way controls had been designed and/or the way in which controls work in practice.
Low	Findings that identify non-compliance with established procedures or opportunities to further enhance the service quality framework.	- Minor control weakness - Minor non-compliance with procedures/ standards - Opportunities or observations surrounding the service quality framework	In the context of our audit, we typically identified that low priority findings were of a nature where observations for future enhancement were identified to the way controls had been designed and/or immaterial control weaknesses were identified.

4 Approach

4.1 Service element overview and walkthrough

We obtained an overview of how each service element operates at HAL. This involved meeting with key stakeholders responsible for the oversight and delivery of each service element. We also met with stakeholders at HAL who collated and published the service element results on a monthly basis. In addition, we met with the individual's responsible for calculating and applying rebates and bonuses.

During this process we conducted site visits to HAL and sighted key operational activities that supported the collation and analysis of data for the service element. We also obtained and reviewed key documentation relevant to each service element.

4.2 Audit procedures

Based upon our understanding of each service element, we developed an audit procedure specific to HAL. These audit procedures guided our testing approach in the following areas:

- Review of calculations, models and systems
- Validation of data inputs
- Reasonableness of calculations
- Recalculating rebate/bonus payments
- Publication of service standard results.

4.3 Review of calculations models and systems

We inspected the key Excel workbooks that are used for each service element calculation to assess the integrity of data and calculation methods used. This included an assessment of:

- Security controls in place to prevent unauthorised access or accidental modifications to the spreadsheet (e.g. password protection)
- Change controls in place to ensure modifications are appropriate and authorised (e.g. change logs)
- Formula accuracy, macro (automated routines) and external links assessment using a specialist Excel auditing tool called 'XL Audit'.

Furthermore, we have tested the methodology used by third parties to weight the QSM scores by passenger numbers by independently re-performing the weighting for a sample month and comparing to the outputs provided to the airport. This has been performed using our data analytics software, IDEA, by taking the raw passenger data and QSM survey inputs and transforming it using the algorithm rules.

4.4 Validation of data inputs

Applying a sample testing approach, we validated key data inputs for each service element. This validation included the review of:

- Maximo work orders raised for asset downtime
- CCTV footage for both security and control post queue times
- Material event documentation, to support aerodrome congestion calculations.

4.5 Accuracy of calculations

We reviewed key supporting calculation models and spreadsheets for each service element to assess whether these had been designed appropriately (in line with service quality requirements) and were