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Audit of Service Quality Regulation at Heathrow Airport Limited

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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

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
Passenger Operational and Airline Operational Elements	PSE (General)	% Time serviceable and available for use, independent of any other element	99.00%	All
	PSE (Priority)		99.00%	All
	Arrivals Baggage Carousels		99.00%	All
	Track transit	% One train	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		99.00%	All
Jetties		99.00%	All
Fixed Electrical Ground Power (FEGP)	% Time serviceable and available for use, independent of any other element	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 setup 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 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 of design of the service quality measurements to improve the passengers 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 HALs 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 Auditors 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 passengers 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 passengers 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 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.	N/A

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.

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 consistency 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 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 regards 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.	**Considerations for the future**
	Service standard specific
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.	7.1l
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.	

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, Track transit 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.	**Detailed findings** 6.4 6.8
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.	**Considerations for the future** Service standard specific 7.1F 7.1M 7.1N
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	Airport operational processes 7.2C
- Our audit identified minor discrepancies between the stand availability, arrivals baggage carousel and track transit system (TTS) element score. Discrepancies occurred due to either formulae errors contained within spreadsheets used for calculation or manual input errors.	7.2H 7.2I 7.2J
Considerations for the future Service standard specific	7.2K 7.2L 7.2M
- 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 regards to the appropriateness of exclusions raised and approved.	
Airport operational processes	

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 Auditors 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 HALs 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

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.

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

operating effectively in practice. Testing in this area included activities such as:

- Tracing data inputs through from data input to the externally published service performance results – including where different spreadsheets are used as part of the service element calculation
- Testing key formulae within calculation models/spreadsheets to assess whether these are in line with the requirements of the service standard calculations
- Obtaining supporting documentation for any exemptions / exclusions, including evidence of approval from the AOC and other relevant parties.

4.6 Recalculation of rebate / bonus payments

As part of our review of the reasonableness of service element calculations, we took a sample based testing approach to recalculate a sample of rebate/bonus payments throughout of audit period. This included:

- Testing key formulae within rebate/bonus payments models/spreadsheets to check these are in line with requirements calculations within the service standards
- Testing to ensure rebates/bonuses have been calculated based on reported service quality results for the relevant period
- High level review of annual rebate wash-up process.

4.7 Publication of service standard results

For each service element, we compared a sample of service element results across our testing period to published results of the external websites of HAL. Furthermore, we also validated service element results to regulatory accounts, per the Licence requirements.

4.8 Comparison to good practice

Throughout our review, we considered the operational practices at HAL compared to other good practice we have observed elsewhere within the sector, similar organisations and other regulators.

5 Service Element Overview

Passenger satisfaction

Passenger satisfaction is measured via the Quality of Service Monitor (QSM) survey that is conducted on a monthly basis assessing the satisfaction of customers over a variety of service elements.

The surveys capture a range of service elements that HAL is assessed on as listed below:

- departure lounge seating availability,
- cleanliness,
- way-finding,
- flight information,
- security and
- wi-fi.

Surveys are conducted by a third party (Epinion) who specialise in planning and facilitating surveys in the aviation sector. Surveys are completed on handheld devices and performed in the departure gate for departing passengers or within the arrivals concourse for arriving passengers.

Each month a sampling split detailing the overall monthly survey targets for both arrivals and departures is prepared by HAL. The sample is provided to Epinion and used as a basis for preparing a quota of surveys to be completed. Quotas pin pointing passengers on particular flights will only be completed for departing passengers. Epinion is responsible for the survey data and completes weekly, bi-monthly and monthly data cleansing exercises to ensure the data is correct and complete. At month end the data will be extracted for all the relevant questions from the

survey for the purpose of judging the QSM results will be extracted and provided to HAL covering both departures and arrivals results.

HAL then provides the raw data to a third party specialist data and analysis firm within the aviation sector (Aviation Analytics) who will apply a weighting factor the results to ensure they are standardised by the amount of passengers who travel through each of the HAL terminals. Additional weighting of the results is applied based on a band of country groups which was agreed between HAL and the AOC/CAA. Once finalised results are completed they are reviewed by the HAL Passenger Experience team for accuracy.

Security and control posts

HAL is measured on their security queue times across the HAL estate. This includes the central, transfer for passengers, staff security areas and the processing of vehicles through control posts. Both security and control post queue times are recorded and reported via the Operational Performance Monitoring (OPM) tool. The OPM tool is a security management tool that assists manage the flow of passengers and assists security with planning the opening and closure of security lanes and staffing levels for security officers.

Passenger and staff security

Security queue times are measured by calculating the difference in time between a passengers in count to the security area and their out count minus unimpeded walking time. Unimpeded walking time is the time for any passenger to walk through the security area without a queue being in place and therefore allows HAL to only record the time a passenger is actually held in a queue.

There are several different methods adopted across the Heathrow terminals to capture the in count and out count of security queue times within OPM. These include:

- **Automated Ticket Presentation (ATP)** which is a measure that is used to capture the in-count when a passenger scans their ticket upon entering the security queuing area. Once the ticket is scanned the time will be recorded and transferred to the OPM system.
- **Bluetooth** which is used to capture the in count measure in conjunction with laser technology. If Bluetooth devices are activated on passengers personal device then it will be captured and recorded at the point of entry to the security area. The measure will however not be used if there is not a high take up as it will not be viewed to be a reliable measure due to the small population of passengers.
- **Lasers** that are positioned on a roof within T2, 3 and 4 to capture the in count for passengers entering the security area. The lasers are positioned on the roof and will capture all individuals passing through.
- **CCTV** which is used tool to assist Wilson James manually capture the security queue times.
- **Walk through metal detectors** that are used to record the out count for all terminals (excluding T5). When an individual walks through the metal detector there is a sensor which will record the person having been processed.
- **Barcode Recognition Measurement (BQM)** is a measurement used in T5 which uses a barcode recognition technology to capture the out-count for passengers. BQM machines are located next to the roller bays in the security area. The BQM system requires passengers to manually opt in to scan their ticket.

A table of the method adopted for each security intake across HAL is documented under Appendix C

The actual methodology for calculating the security queue times varies between terminals with the three following methods adopted:

- **Automatic Queue Measurement (AQM)** which is a measurement based on 'Littles Law', being a weighted long term average of passengers who progress through security. Little's law therefore does not calculate the queue time at the individual passenger level but merely adopts an average for passengers based on recording the amount of passengers in and amount of passengers out over a set period of time.
- **BQM** is used to calculate the queue time within T5 and is an average of passengers time through the queue by recording the Automatic Ticket presentation time at the entrance gate as the in count and the Barcode Recognition (BQM) as the out count.
- **Enhanced manual (CCTV recording)** is used within T5 and staff security which will manually calculate the queue time by selecting one passenger to record their time in the queue across the 15 minute time slice. The queue time is uploaded directly to OPM.

All methods mentioned above will automatically have the unimpeded walking time removed automatically from OPM.

On a daily basis the Security Managers in each of the terminals will review the prior days queue time results. Any anomalies will be investigated and may require manual adjustments. There is a defined process in place for manual adjustments whereby three separate queue times will be taken from the 15 minute time slice and the average will be manually input in OPM. The three supporting times will be recorded on a supporting spreadsheet that is reviewed and signed off by the a Security Manager within the relevant terminal. Input of the revised scores will be completed by the Security Performance Manager.

HAL also engage a third party (Wilson James) to record manual queue times via CCTV footage for all staff security and T5 transfers. Wilson James hold access to the OPM system and will manually record the security queue times in real time.

On a daily basis the extracts from OPM are uploaded to an access database holding all security queues which will calculate the amount of

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failures within the month. At month end the report is generated and provided across to the SQR Co-ordinator.

Control Posts

There are 13 control posts in operation at HAL which provide an access point for vehicles to enter airside. The control posts are split into control post groups for the purpose of measurement. The control post groups are split as follows:

- CTA (CP5, CP8)
- Cargo (CP10, CP10a, CP25a)
- Eastside (CP16)
- Southside (CP24)
- Terminal 5 (CP18, CP19, CP20).

The time between the entrance to the control post zone and leaving the control post zone is measured via automated number plate reading technology (ANPR).

ANPR's are used by identifying the vehicles number plate at the entrance point and then capturing the number plate at the exit. OPM will only utilise completed scores where the in count and out count have been accurately captured by the system. The data is automatically interfaced to the OPM system for every 15 minute time slice. The ANPR system has a number plate reading success rate of approximately 50-70%.

Each ANPR camera is located at the agreed upon entrance point for each control post and the exit point of the control post. The entrance and exit points are detailed in the Campus Security SQR Assurance Package – Post Details documents. The entrance and exit points and agreed upon with the AOC.

On a daily basis the duty manager/security manager will review the prior days control post queue times. If they have any outliers or discrepancies they will analyse the control post queue time. If there are any discrepancies the Duty Managers will review the CCTV footage and take the longest queue time from within the 15 minute time slice and update

the OPM system accordingly. Manual entries are recorded in the Campus security MQT reports. Each month a manual reclaims spreadsheet is compiled to detail all the manual reclaims input into OPM.

The monthly reporting is extracted from the monthly database extract sheet that will obtain failures for each day of the month across all control post groups.

Passenger operational and airline operational elements

HAL is measured on the availability of a number of assets across each terminal. The majority of assets, excluding stands and pier served stands are managed via Maximo; an asset management system. All planned or reactive maintenance work is scheduled and recorded within Maximo. In practice, Engineers are allocated work orders to complete and will log directly into Maximo and document the time of completion for each job and raise any follow on work where necessary. All Engineers whether direct labour (employed by HAL) or contractors hold access to Maximo. In some cases, downtime may be required to be manually input to the system, which will overwrite the calculation taken from the completion time and logging time of the work order.

PSE (general), PSE (priority) and jetties

Each month a work order downtime report, in spreadsheet format, is produced in Maximo illustrating all work orders during the month where the asset was not available during core hours. The spreadsheet is formula driven to calculate the total amount of assets in availability hours and the overall availability percentage within the core service hours, for both PSE (general and priority) and jetties. The report is reviewed by a member of the Data and Reporting team and any relevant exclusions applied.

Stand entry guidance system (SEGS) and Fixed electrical ground power (FEGP)

As above, a work order downtime report is produced in Maximo illustrating all work orders during the month where the asset was not available during the core working hours. The results are then transferred

across to the FEGP SEGS Trigger report which summarises the availability/downtime results for the core service hours for every month.

Pre-conditioned air (PCA)

Similar to SEGs and FEGP each month a work order downtime report is produced in Maximo illustrating all work orders during the month and where the asset was not available during the core working hours. The report is then used to determine the overall availability percentage on a summary worksheet. The summary worksheet calculates how many assets there are and apportion the downtime to calculate the asset availability within the core service hours. The PCA is only assessable for terminals 2, 3 and 5.

Track transit system (TTS)

All TTS work orders are manually entered into the TSS SQR spreadsheet. The spreadsheet provides detail of all fault data and provides the ability to complete comparisons of monthly and yearly data. The spreadsheet has inbuilt formulas that will calculate for any given month the downtime for the TTS for one train or two trains based upon the split of downtime manually input into the spreadsheet assigned. The worksheet allows the user to filter based on the month of the year and the service element type being either one shuttle down or two shuttles down. The TTS is only assessable for T5.

Arrivals baggage carousel

Arrivals baggage carousels reporting is overseen on a day to day basis by Babcock. A contract is in place with Babcock that requires availability percentages to be achieved otherwise a penalty may be applied.

On a daily basis the SQR reporting is updated to include all work orders from the previous day. The reports are generated by the Engineering Manager at Babcock and separated out by each terminal. The spreadsheet is restricted on the Hub (Heathrow Intranet) to Babcock employees who require it for reporting purpose or Baggage Managers. The spreadsheet is be reviewed by the Baggage Assessment team on a

daily basis to check that reclaim exclusions have been appropriately applied.

At the end of the month the finalised spreadsheet is provided across to the Baggage working group team for review.

Stands

The measurement of stands is managed by the stand planning team. The stand planning team monitor stand availability though a macro driven spreadsheet on the shared drive. This spreadsheet imports data from IDAHO to show the stand closures data from the prior day. The data will be reviewed separately to ensure accurate data and, if relevant, reason codes exist with any exclusions being removed from the calculation. We noted a common exclusion occurs where the airline equipment is still on the stand.

At the end of month the data is used to determine the availability hours. The calculation is formula driven and calculates all the stands in operation within the month for each separate terminal and allocate the downtime from IDAHO to determine the stand availability for each terminal.

Pier served stands

At the end of the month the Manager for Stand Planning collates the relevant data from the systems and calculates the service quality metric results.

All data is held within IDAHO (Integrated database for air handling operations), from which passenger data is extracted into the BOSS system for the relevant month on each individual terminal. BOSS is then able to report the total passengers for each terminal into a monthly workings spreadsheet. A secondary query will be run from the BOSS system to extract the relevant pier stand passenger data for each individual terminal which is then merged into the monthly workings spreadsheet. The monthly workings spreadsheet can then be used to calculate the percentage of passengers that are pier serviced for each terminal.

Aerodrome Congestion Term (ACT)

As per the licence HAL manage their ACT via a super log spreadsheet which documents the material events for the month. The criteria for material events are documented within the licence.

When an incident occurs it is reported to APOC who pass on the details of the event to a data analyst responsible for the ACT analysis for recording in the super log. The data analyst will conduct an initial analysis on whether the event constitutes a material event in line with the licence requirements Details of the event will also be provided to the Aircraft Flow Manager who confirms and approves that the event has initially been classified appropriately. If it is determined that a material event has occurred then the impact from the material event is calculated within the super log spreadsheet.

An analysis is conducted to determine the maximum cumulative arrival movement deferred to understand the impact of the passengers. This analysis is based upon the past eight weeks of data from NATS for actual arrivals/departures. There must be a material operational impact for rebates to be payable to the airlines.

All events are discussed in the bi-monthly ACT working group meeting There is representation on the committee from various stakeholders around the business such as the AOC, NATS and HAL (operational staff).

The committee was formed to assist to distinguish whether an event was to be considered a material event, any decisions are jointly made and documented. If there is a dispute with the classicisation of the event that cannot be resolved by the group then the event will be passed on to CAA to approve. Each month the SQR Co-ordinator will be made aware if any material events take place and will receive the minutes from the bi-monthly meeting.

Publication of service performance

The HAL SQR Co-ordinator is responsible for collating all SQR service performance results each month from operational staff responsible for each service area. Monthly results are captured in a 'SQR Input' spreadsheet. The SQR Input spreadsheet will be provided across the Finance team to input the monthly SQR scores to assess whether there is any rebate or bonus impact.

In addition, the SQR Co-ordinator would input the monthly results within the PDF-Poster template tool ready to be uploaded to the HAL website and provided to the terminals as either a hard copy poster or uploaded to the terminal information screens.

Collation of results, calculation and payment of bonuses and rebates

When all monthly results have been collated by the SQR Co-ordinator they are input within the rebate calculation model spreadsheet which is provided to Finance to calculate any rebate impacts. Prior to providing to finance the SQR Co-ordinator sends an email to all element owners to review the final scores to confirm they are correct.
Monthly results are input within the rebate calculation spreadsheet to calculate any rebate or bonus impact. Rebates and bonuses are calculated based on the variable of passenger traffic. The spreadsheet has been designed to include all formulas as documented within the licence for each element to determine the rebate or bonus impact. The initial rebate/bonus calculation is based upon the forecasted passengers. When the total amount of rebate per terminal is calculated the finance team need to determine the rebate issuable to each airline based upon the forecasted passenger traffic. The calculation is be completed by the transactional team at the BCT in Glasgow.

At the end of the regulation year (31 August) the transactional team complete a wash up exercise to determine the actual rebate/bonus issuable to each airline based on the actual passenger traffic. The variance in the yearly rebate is applied to each airline across the terminals.

6 Detailed findings

The following observations were identified during our review as having a direct, or potentially direct, impact on service performance scores, and associated rebates, reported by HAL.

6.1	**High**	**In count of passengers from premium security queues – T5 (North)**

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
Finding Passengers who enter security at the T5 North premium queue are currently not captured as part of the 'in count' aspect of the queue calculation. HAL do not currently have the technology in place to capture passengers entering the security area at the T5 North premium queue. T5 central search security is calculated based on a barcode recognition (BQM) average measurement which will capture within each 15 minute time slice all passengers who scan their ticket upon entering the security area (as their in count) and those who elect to scan their ticket at the roller beds on the BQM terminals which will record their out-count for the security queue. The calculation will only use passengers who have scanned in and out of the security area. Any passenger who therefore enters the T5 North premium queue will be excluded from the in-count aspect and there potential queue times will not be captured which may either have a positive or negative impact on the overall queue time calculation. HAL is aware of this limitation of the T5 central search	HAL should implement a mechanism to capture passenger in-counts at the premium queue at the T5 North security entrance.	*Heathrow was aware of the technical issue with the non-counting of premium Fast track passengers in the new North entrance.* *Heathrow has completed a technical upgrade to the system liaising with BA, the system went live in March and all passengers have been included in the SQR regime since then.* **Date Effective:** *March 2016* **Owner:** *Steve Ritchie*

| 6.1 | **High** | **In count of passengers from premium security queues – T5 (North)** |

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
security queue calculation and is w orking tow ards **Implication** Without the inclusion of the passengers entering the T5 North premium queue in the overall central search security queue calculation, there is an increased risk that security queue times are not an accurate representation of the actual queue time.		

6.2	**High**	**Security – CCTV records**

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
Finding CCTV cameras are in place across HAL for the purpose of passenger safety, and to enable internal reviews of operational activities. These CCTV cameras cover passenger and staff security screening areas across all HAL terminals, as well as external control posts of the airport. CCTV footage is currently retained by HAL for a period of between 48 hours and 60 days. HAL currently captures security queue times for staff searches (all terminals) and T5 transfers via CCTV footage that is completed by Wilson James (third party contractor). As part of our audit, we selected a sample of 30 time slices (within the SQR core hours) on the 9th March 2016 to verify recorded security queue times against CCTV footage. We were limited to review CCTV footage two days in arrears due to footage not being retained past 48 hours on some cameras in operation at HAL. Our sample was spread across all security screening areas, including passenger central search, passenger flight connections, staff search. Out of our sample of 30 time slices, we identified that some critical CCTV footage (images to the entrance to the staff security area at T5 North Apron) to assist record was unavailable in two instances. We were informed by Wilson James that CCTV cameras may not be operational at all times due to faults or maintenance by the CCTV team. As there is some instances where there is no real time monitoring of all CCTV cameras across Heathrow, camera outages will only be identified where either HAL security or Wilson James goes to view CCTV footage. In addition, we were informed by Wilson James that some search areas do not have cameras located in adequate coverage areas to assist provide an accurate security queue time. For example within T3 staff security there is no camera	HAL should conduct regular checks of all CCTV cameras to ensure these are operational and are recording CCTV footage. Alternatively, HAL should investigate whether an alert can be set up from CCTV cameras where these become non-operational. As part of wider review and upgrade of CCTV functionality, HAL should consider whether enhancements can be made to CCTV cameras to prevent, or minimise, camera downtime and further consider is CCTV coverage is adequate to assist record and capture queue times. In addition, HAL should conduct quality assurance checks security queue times recorded by Wilson James on a periodic basis. To assist the ability to completed checks on Wilson James HAL should assess CCTV configuration to ensure that camera footage is retained for a standardised period of time. Further, HAL should record the identified breach within the monthly SQR results to accurately reflect the T5 staff security queue time monthly results.	*The T5 Upgrade is due to commence in September to provide greater reliability and functionality. This will roll out across the Terminals as funding is improved. T5 is due to be completed by end of October. Relationship will be built with the CCTV supplier to explore the possibility of reviewing the service levels and a warning system for cameras associated with queue timing.* *The Wilson James assurance process will be implemented in two stages. The first stage will be based on the current set up, followed by a second stage which will commence following T5 moving to a harmonised queue measurement in July.* *There is currently a scoping of works to provide additional coverage of all staff search areas in relation to queue timing. Work will take place upon completion of scoping and funding approval.* ***Date Effective:*** *Dates as above* ***Owner:*** *Steve Ritchie*

| 6.2 | **High** | **Security – CCTV records** |

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
available at the security. Furthermore, in one of the time slices (9th March 2016, 11.30am – 11.45am) for the T5 North Apron staff search queue times reported by the third party contractor Wilson James (4.59 mins) had a material variance to our independent review (12.21 mins). The impact of this variance would have caused a breach which was not reported. We acknowledge that HAL are undertaking a wider review and upgrade of CCTV functionality at HAL, which may help to address issues with CCTV footage in the future. **Implication** Where CCTV cameras are not operational, this impacts HAL's ability to investigate a passenger complaint or conduct independent checks of key operational activities, including security queue times. Furthermore, as we were unable to verify the accuracy of security queue times manually recorded by Wilson James, there is a risk that security queue time service reporting is inaccurate.		

6.3	**Medium**	**Passenger satisfaction discrepancies**

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
Finding Our audit identified minor discrepancies between the passenger satisfaction element scores as per the published results and the supporting documentation in place. Our testing conducted on a sample of 60 passenger satisfaction scores during the period April 2014 to December 2015 identified the following: • Four out of 60 variances occurred due to changes in the calculation methodology for non-financial SQR measures (security and wi-fi). HAL retrospectively applied the same methodology as used in the four main financial passenger satisfaction SQR measures taking into account the impact of passengers volumes in the SQR score calculation. As a result all month and moving annual average (MAA) results for Security and Wifi back to April 2014 have been adjusted and will therefore not match the published results. However, the revised calculation has strengthened the accuracy of the results and the methodology is now in line with the remainder of the SQRB attributes. (Refer to Appendix C) • Five of 60 variances occurred due to an error within the formula on the Weighted monthly results spreadsheet collated by the passenger experience team. After investigation it was identified that the impact did not affect the monthly results as they were appropriately published however has impacted the historic results as the spreadsheet is a rolling calculation containing all historical monthly results. (Refer to Appendix D) • Two out of 60 variances occurred due to the MAA figures input into the rebates spreadsheet instead of the monthly SQR scores. These input errors caused the MAA within the rebates spreadsheet to be incorrect and therefore the potential for an incorrect rebate exists. However, the revised calculation has strengthened the	HAL should review the SQR Weighted Apr08_onwards_Dec15 spreadsheet to ensure no further formula errors exist. In addition HAL should look to improve spreadsheet data entry validation controls to ensure data integrity within spreadsheets (refer to detailed finding 5.1.8 for further details of spreadsheet controls) Further, HAL should communicate the importance of adequate independent reviews to all individuals tasked with inputting SQR results into the rebates spreadsheet. HAL should retrospectively update any input variances within the rebate spreadsheet and the published results to reflect the actual results.	*As discussed at the time of the Audit Review, the SQR Weighted Apr08_onwards spreadsheet has been fully amended with all formulas updated and validated by the Passenger Experience Team. Cell and Formula controls are now in place. These updates have been communicated to all parties involved in the SQR QSM process.* *HAL accept the variances highlighted by the audit and will consequently update the calculated scores, and if required to do so, will update the published scores. However it's important to note that the amendments relate to WiFi and Security which are non-financial related SQR measures.* *Date Effective: Completed* *Owner: Catherine Howard*

6.3	**Medium**	**Passenger satisfaction discrepancies**

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
accuracy of the results and the methodology is now in line with the remainder of the SQRB attributes. (Refer to Appendix E) • Three out of 60 variances occurred as HAL made a decision to apply all decimal places instead of the two as required within the licence within the Weighted monthly results spreadsheet to improve data quality. (Refer to Appendix F) During the course of this audit HAL has investigated the above discrepancies and the following actions were taken. • The SQR Weighted spreadsheet was independently reviewed at the time of the audit to ensure there were no further formula errors. There was no rebate implication as a result of the above variances. **Implication** The absence of adequate independent review of the migration of scores from the SQR input spreadsheet to the rebate spreadsheet increases the risk that inaccurate scores are reported, which may result to either financial loss (via rebates payable) or reputational damage. In addition, erroneous formulas increase the risk that passenger satisfaction scores in accurately calculated and reported.		

| 6.4 | **Medium** | **Asset availability discrepancies** |

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
Finding Our audit identified minor discrepancies between the stand availability and Track transit system (TTS) element scores as per the published results and the supporting documentation/calculation in place. Our testing conducted on a sample of 10 monthly stand availability and 10 monthly TTS scores during the period April 2014 to December 2015. There is an inherent risk of human error from the use of spreadsheets, which has resulted in the following discrepancies: • Stands: For the month of January 2015 the calculation for the stand availability for T2 was not accurately applied. The formulas used within the spreadsheet did not capture all downtime within the month excluding 54 seconds from the calculation. The result was therefore overstated as 99.89% when the result should have been 99.88%. The spreadsheet did not have locked down formula cells and therefore a manual error in the formulas existed. • TTS: For the month of November the scores as per the TTS calculation spreadsheet (99.44%) were inaccurately transferred across to the SQR input sheet (99.94%) resulting in the published scores being overstated by 0.50%. HAL is in the process of implementing a database whereby all results are keyed in directly by the element owners reducing the potential for manual entry errors. The process was trialled in January 2016 for the first time on a number of service elements and has not been rolled out across all service elements. There was no rebate implication as a result of the above variances. **Implication**	HAL should implement the following controls to improve the data integrity within spreadsheets that assist calculation the SQR scores: • Spreadsheet files should be protected with some form of access control • Non input related spreadsheet fields should be password protected. In addition, we support HALs decision to automate many of the manual processes by allowing service element owners to input results directly into the SQR database. We further support HALs initiative to introduce a mandatory independent review of all SQR results entered by an individual whom was not responsible for the collating of the SQR element score. Beyond implementing the above, HAL should retrospectively update any input variances within the rebate spreadsheet and published scores to reflect the actual results.	*Changes to the stands formula calculation have been amended and spreadsheets have been password protected as recommended.* *Date Effective: April 2016* *Owner: Graham Taylor.* *Engineering & asset management are undertaking a full review & re work of the current calculation spreadsheets to produce a single output document which will be passed to the SQR performance manager. The TTS discrepancy will be corrected to reflect the accurate result for the month of November 2015, as identified during the audit.* *Date Effective: by July 2016.* *Owner: Gavin Lattimore* *HAL accept the variances highlighted by the audit and will consequently update the calculated scores and rebate spreadsheets, and if required to do so, will update the published scores.* *Date Effective: 31st July 2016* *Owner: Philip Bell and Eduardo Teixeira*

6.4	**Medium**	**Asset availability discrepancies**

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
There is an inherent risk of human error with spreadsheets especially where manual data entry is required. In addition, the absence of independent review of the migration of scores from the supporting calculation to the SQR Input spreadsheet and ultimately the published SQR results increases the risk that inaccurate scores are reported, which may result to either financial loss (via rebates payable), reputational damage or understated/overstated SQR scores.		

6.5	Medium	Control post queue time manual overrides

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
Finding When automated number plate reading technology (ANPR) technology is unavailable and manual queue times are not captured and recorded in OPM, the Campus security team will complete manual overrides via CCTV footage. Campus security CCTV footage is retained for approximately 30 days across all control posts. Each time when a manual override is completed the Campus security team will review CCTV footage, where possible, for three individual queue times within the 15 minute timeslice. The highest of the three queue times will then be recorded as the actual queue time for the timeslice in OPM. The CCTV footage to support the override is retained by the Campus Security team to evidence the accuracy of the override. As part of our audit, we selected a sample of 20 manual overrides during the month of January 2016 to verify the manually override queue times against CCTV footage retained. Our sample was spread across all control posts and days within the month. Out of our sample of 20 manual overrides we were unable to validate the accuracy of the time recorded in OPM due to the unavailability of CCTV footage in three instances. Refer to Appendix J for further details. **Implication** An absence of CCTV footage to substantiate any changes to the control post queue times increases the risk that inaccurate amendments are processed resulting in inaccurate queue time reporting produced.	HAL should communicate the importance of retaining CCTV footage for manual overrides to all staff tasked with completing manual overrides. Further, HAL should complete a reconciliation between footage retained and manual overrides captured on a monthly basis to ensure that all footage is available should any review of override be conducted.	*Heathrow agrees with the points and actions raised. This action was completed in October 2015.* ***Date Effective:*** *October 2015* ***Owner:*** *Jason Knight* *HAL accept the variances highlighted by the audit and will consequently update the calculated scores and rebate spreadsheets, and if required to do so, will update the published scores.* ***Date Effective:*** *31st July 2016* ***Owner:*** *Philip Bell and Eduardo Teixeira*

6.6	**Medium**	**Security scores discrepancies**

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
Finding Our audit identified minor discrepancies between both the central search and staff search security service element scores as per the published results and the supporting documentation in place. Our testing conducted on a sample of 10 central search (<5mins) and central search (<10mins) security scores during the period April 2014 to December 2015 identified the following: • Two variances which occurred due to the time that the updated queue times from a manual process has been inputted into OPM against when the SQR Co-ordinator compiled the security scores and published results. HAL has since introduced the role of the Security Performance Manager and a key responsibility of this role is to ensure OPM is updated prior to month end reporting. (Refer to H for further details) • One variance which occurred due to a manual entry error between the SRP report and the input of results to the SQR input spreadsheet resulting in the published score being understated by 0.02% (Refer to I for further details) In addition, our testing conducted on a sample of 10 transfer search security scores during the period April 2014 to December 2015 identified the following: • One variances were identified between the amount of breaches recorded as per the SPR Report (71) and the OPM system (78). The variances occurred as a result of the treatment of hold times at the T5 transfers elevator. When the T5 transfers security queue is quite busy, the HAL staff would hold the queue at the bottom of the escalator to the T5 South security queue. In the past the holding time at the bottom of the escalator was added to	We support the initiative taken by HAL to introduce the role of the Security Performance Manager to ensure that OPM is up to date. The role will ensure that an independent review is completed on OPM inputs. HAL should retrospectively update any input variances within the rebate spreadsheet and the published results to reflect the actual results. In addition, we support HAL and BAs decision to include the hold time in the calculation of the T5 transfer security queue time. Further, HAL should conduct an analysis to see whether there was any rebate impact for the T5 transfer security queue prior to December 2015. Further, it should be noted that the introduction of a secondary escalator in March 2016 to transport transfer passengers to the T5 North security queues should reduce the requirement of security staff to hold passenger foot traffic.	*Heathrow has previously reviewed historic data with BA when this agreement was reached. Heathrow can provide communications with BA as required in order to close this point.* *The Performance Manager role is now in place and will develop and lead the provision of assurance to the SQRB package for Security.* *Date Effective: June 2016* *Owner: Steve Ritchie and Matthew Brittaine*

| 6.6 | Medium | Security scores discrepancies |

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
the queue time recorded by Wilson James in OPM but was not recorded in the SPR Report. In December 2015, it was agreed between HAL and British Airways (BA) as the major airline stakeholder in T5, that the holding time at the escalators would be included in security queue times reported going forward. Further, our testing conducted on a sample of 10 staff search security scores during the period April 2014 – December 2015 identified the following: • One variance occurred due to a manual entry error between the SRP report and the input of results to the SQR input spreadsheet resulting in the published score being understated by 0.16% (Refer to I for further details) There was no rebate implication as a result of the above variances. **Implication** The absence of independent review of the migration of scores from the supporting calculation to the SQR input spreadsheet increases the risk that inaccurate scores are reported, which would result to either financial loss (via rebates payable) or reputational damage. In addition, the absence of recording the hold times for T5 transfer security queue times does not reflect the true time a passenger was required to queue therefore providing an inaccurate queue time that may result in rebates issued to airlines where warranted.		

6.7	**Medium**	**Control post discrepancies**

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
Finding Our audit identified minor discrepancies between both the control post service element scores as per the published results and the supporting documentation in place. Our testing conducted on a sample of 25 control post queue times across the five control post groupings during the period April 2014 to December 2015 identified the following: • 10 variances in breaches across four separate control post monthly scores occurred due to human error in regard to the process of updating either OPM or the SPR Report. Refer to Appendix K for further details. • 24 variances in breaches across nine separate control post monthly scores occurred due to data storage issues within OPM whereby when we extract the queue times out of OPM a range of time slice breeches have been duplicated thus affecting the number of breeches in OPM archive vs. what HAL are reporting on the SPR report. HAL is aware of the issue and is currently investigating its origin. Refer to Appendix K for further details. • 15 variances in breaches across three separate control post monthly scores occurred due to a delay in the manual queue time sheets being into OPM. Following a review by Campus security in 2015 the variances were investigated and corrected with the relevant Duty Managers now accountable for inputting into OPM prior to month end to ensure accuracy in reporting. Refer to Appendix K for further details. There was no rebate implication as a result of the above variances. **Implication** The absence of independent review of the migration of scores from the supporting calculation to the SQR input	HAL should review the control post breach results on a daily basis to ensure that breaches as per the OPM system are accurately captured in the SPR report used to determine the monthly results. In addition, HAL should communicate the importance of timing recording of manual override queue times to those tasked with completing manual overrides. It is further recommended that an independent review of the results is completed prior to submission to the SQR Co-ordinator to ensure all manual overrides are captured in results. Furthermore, HAL should continue to investigate the cause of the OPM archive issues and rectify any issues as possible to assist gain comfort that the system is operating effectively.	*Following a review by Campus security in 2015 the variances were investigated and corrected with the relevant Duty Managers now accountable for inputting into OPM prior to month end to ensure accuracy in reporting.* *Date Effective: October 2015* *Owner: Jason Knight*

| 6.7 | Medium | Control post discrepancies |

Finding and Implication	Proposed action	Agreed action *(Date/ Ownership)*
spreadsheet increases the risk that inaccurate scores are reported, which would result to either financial loss (via rebates payable) or reputational damage.		

6.8	Low	Arrivals baggage carousel

Finding and Implication	Proposed action	Agreed action *(Date / Ownership)*
Finding Our audit identified minor discrepancies between the arrivals baggage carousel element scores as per the published results and the supporting documentation in place. Our testing conducted on a sample of 10 arrivals baggage carousel scores during the period April 2014 to December 2015 identified the following: • During the month of May 2015, the arrivals baggage carousel results for T2 (99.55%) and T3 (99.79%) were published from provisional results provided on 4th June 2015. The final scores for T2 (99.54%) and T3 (99.80%) were not provided until after the cut-off date. Since this occurrence, there has been a change in timetable introduced to the SQR reporting process requiring that final scores be provided to the SQR Co-ordinator by 7th of the month. **Implication** The use of provisional scores through the SQR reporting process increases the risk that finalised SQR scores are not submitted and inaccurate scores are published.	HAL has already taken appropriate action in changing the timetable for submitting results. In addition, HAL should retrospectively update any input variances within the rebate spreadsheet and published results to reflect the actual results.	*HAL accept the variances highlighted by the audit and will consequently update the calculated scores and rebate spreadsheets, and if required to do so, will update the published scores.* **Date Effective:** *31st July 2016* **Owner:** *Philip Bell and Eduardo Teixeira*

7 Future considerations

7.1 Service standard specific

The following observations were identified during our review 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.

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1A	Passenger Satisfaction	**Language of QSM** The QSM survey for arrivals and departures passengers is only currently provided in English. As there is a large majority of passengers whom do not speak English as a first language the QSM results may not be representative of the traveling population. In 2015 there was 15,127 arrivals and 21,909 departure surveys conducted. An analysis of survey refusals for the year 2015 identified that 1,820 arrival surveys (12%) and 985 departure surveys (4%) were refused due to language. HAL has acknowledged that they are investigating the introduction of the QSM in multiple languages. HAL should consider delivering the QSM in multiple languages so that greater feedback across all traveller profiles.	**Low**	*HAL Response:* *HAL monitors and tracks all refusals including those due to language.* *We are enhancing our technological capabilities with the utilisation of IPADs instead of CAPI devices and progressing our internal discussions to develop a QSM interview in key languages such as Chinese, Russian and Arabic.*
7.1B	Passenger Satisfaction	**QSM for transfer passengers** The current design of the SQRB does not include any measurement of the passengers transfer experience. Whilst HAL do collate data for passengers experience of the transfers process via the Transfers QSM it is not included within the SQRB. The CAA may wish to investigate whether the transfers process should be assessed as part of the SQRB.	**Low**	*HAL Response:* *HAL currently captures the Connections journey using a robust and consistent methodology that mirrors the Departures and Arrivals QSM programmes.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1C	Passenger Satisfaction	**Regular review and update of SQRB specific QSM questions** SQRB specific QSM questions for both arrivals and departures are not currently subject to periodic review. Whilst the QSM survey is reviewed on an annual basis there is currently no forum for the CAA, HAL and the AOC to review the appropriateness of questions used to assess passenger satisfaction for the purpose of the SQRB. Whilst It is acknowledged that the questions were introduced in April 2014, there should be a process in place whereby the AOC, CAA and HAL consult to review the scope of questions offered in the QSM. Without appropriate review of the SQRB QSM questions there is a risk that the SQRB regime is not adequately designed to assess passengers satisfaction at HAL. Should there be amendments to the questions, there would need to be a re-base of the targets.	Medium	*HAL Response:* *HAL conducts an annual review of the QSM questionnaire content amongst all key stakeholders including Operations.. If there is to be a review of the SQRB QSM content, targets would need to be rebased and the review of questions would need to be tested against a criteria, some of which may include 1) passenger priority 2) level of HAL/Airline responsibility and 3) Level of relative performance measured by benchmark airports in ASQ.*
7.1D	Passenger Satisfaction	**Inclusion of wider passenger experience elements in the QSM questions assessable under the SQRB.** Whilst the SQRB related QSM questions assess the airports performance across a number of passenger satisfaction elements there are a number of passenger experiences that are not considered. Airports are also measured on passenger satisfaction within the QSM and via an independent survey of airport service quality (ASQ) which both consider a number of passenger satisfaction elements that are not currently assessed via the SQRB. The CAA may wish to include further passenger satisfaction measures in future licence periods such as; courtesy and helpfulness of security staff, thoroughness of security inspections, availability of parking facilities, availability of baggage carts / trolleys, speed etc.	Low	*HAL Response:* *HAL would welcome the CAA's recommendations on what the new scheme could entail.*
7.1E	Passenger Satisfaction	**Equal representation of passengers surveyed** The current design of the QSM survey may not capture an equal representation of the passengers who travel through Heathrow. Business passengers who attend business lounges prior to their flight are not able to be surveyed within the lounge area. If business lounge passengers do not arrive at the gate until departure they will not be selected to take part in the survey it is very unlikely that they will have time to be able to complete a survey. Without an appropriate spread of passengers surveyed to analyse passenger satisfaction there is a risk that data capturing is not adequately designed to provide representative data. The CAA and HAL should investigate other options for ensuring that business passengers are proportionally represented in surveys conducted.	Medium	*HAL Response:* *Interviews with business passengers are currently within scope of the QSM survey and HAL would propose that this continues.. However, as of Q1 2016 HAL has started exploring options to track the passenger journey by other mechanisms that will complement QSM.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1F	Passenger Satisfaction/ Passenger Operational and Airline Operational Elements	**Design of arrivals baggage carousel service element does not reflect passenger experience** Whilst the arrivals baggage carousel service element is adequately designed to record and analyse the availability of the asset the design of the SQRB does not consider whether the asset is appropriately used. There is currently no consideration on whether baggage is placed on the arrivals baggage carousel with due care and in a timely manner and whether passengers were impressed with the service provided. HAL currently measures baggage waiting time and trolley availability as part of the wider questions within the QSM that are not assessable as part of the SQRB. Without the measurement of baggage time there is a risk that passengers are not provided a quality service with regards to the delivery of their baggage due to poor planning or performance by HAL. The CAA and HAL may wish to revisit the design of the service elements for the H7 period to consider the inclusion of passenger satisfaction questions surrounding the arrivals baggage carousels operation. In addition the CAA and HAL may wish to introduce a service quality measure surrounding the baggage waiting time.	Low	*HAL Response:* *Although consideration is not given to the time it takes for bags to be delivered to the carousels within the SQRB scheme it is a consideration in the Grounds Operations Licence. Ground handler score cards are used to measure handler performance. One of the metrics reviewed is the time it takes for bags to get onto the carousels. These scorecards are constantly reviewed by the community that attends the Airport Users Committee (AUC). Consideration We agree the design of the SQRB should be reviewed for H7 to ensure that the right outcomes are incentivised.*
7.1G	Passenger Satisfaction	**Survey population fit for purpose** As per the Licence granted to HAL by the CAA, HAL is required to complete at least 30,000 QSM surveys across both arrivals and departures. During 2015 HAL completed 37,036 QSM surveys (15,127 arrivals and 21,909 departures). Whilst HAL has exceeded the requirement as outlined within the licence, the CAA/HAL may wish to reconsider whether 30,000 is still the most appropriate benchmark and whether it should be increased or decreased. 30,000 QSM surveys represents 0.0004% of all passenger traffic through HAL for 2015.	Low	*HAL Response:* *We acknowledge the observation*
7.1H	Security & Control Posts	**Fast Track security – T5 (North and South)** HAL has recently (November 2015) introduced fast track security queues in T5 at the request of British Airways (BA). The intention for the fast track security queues was to provide an increased service to the following customers: • Customers travelling in First, Club World, Club Europe or Business UK (plus one guest) • Executive Club Gold and Silver Members (plus one guest) • Oneworld Sapphire and Emerald members The inclusion of fast track security queues presents a risk that the overall average queue time within T5 centrals search security as passengers will be understated. It is recognised that using fast track queues will generally have quicker security queue times then the general central search queues. HAL and CAA should consider removing fast track security from the central security queue calculation. The fast track security could either be measured separately within the SQRB or removed all together as it is an airline driven initiative.	High	*HAL Response:* *To provide improved passenger experience across Security, Heathrow believes that the inclusion of Fast Track passengers enables it to monitor service provision for all passenger categories. This was recognised within the Q6 submission by BA where there was a request that Fast-Track passengers remain within the SQR remit due to the volume of passengers that would use this facility at any particular time of day and that it captures passengers who enter Security through the main entrances.* *Separating Fast-Track from OPM under the current SQRB programme would cause operational constraints alongside technical problems. The architecture of OPM in T2, T3 and T4 does not currently facilitate a cross flow of Fast-Track and Economy passengers. In the event that there is a failure within the system there would be operational constraints*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1l	Security & Control Posts	**Review of control post groupings** At the commencement of Q6 control post groupings were agreed between the CAA, AOC and HAL. The control posts are positioned surrounding the airport to provide airside access at the airport. Throughout 2015 each control post has been subject to differing levels of traffic. The below table provides a breakdown of the control groups and allocates the annual traffic per lane for each control group. *table below* The design of the current control post groupings presents the risk that HAL not be measured based upon a fair and balanced service metric. 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.	Medium	*HAL Response:* *We agree that the design of the control post groupings poses a significant risk to Heathrow. The Eastside group only has one lane and therefore there is a significant risk Heathrow will have to pay out rebates on all control posts if this one lane breaches. Therefore the level of rebates at risk is not proportionate to the volume of traffic going through Eastside group. We would ask the CAA to do a review of the control post groupings.*

Control Post	Volume (Jan 15 - Dec 15)	Number of lanes (in-bound)	Volume per lane
CP5	100,757	4	25,189
CP8	90,837	4	22,709
Total	**191,594**	**8**	**23,949**
CP10	106,225	1	106,225
CP10A	88,999	2	44,500
CP25A	91,082	2	45,541
Total	**286,306**	**5**	**57,261**
CP14	*Not in use*	*Not in use*	*Not in use*
CP16	40,760	1	40,760
Total	**40,760**	**1**	**40,760**
CP18	61,124	3	20,375
CP19	153,343	3	51,114
CP20	169,991	3	56,664
Total	**384,458**	**9**	**42,718**
CP24	208,942	3	69,647
Total	**208,942**	**3**	**69,647**

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1J	Security & Control Posts	**BQM Security** Within T5 the central search area is measured using the BQM measurement. The BQM measurement can be a very accurate measurement methodology as a per passenger queue time for the in count and out count is captured by the passenger scanning their boarding pass. The airline community hold concerns that the BQM measurement is not well designed as it is reliant on passengers electing to scan at the out-count point positioned next to the roller beds in the security area. The design of the measure BQM provides the potential for the manipulation of results if the scanners are not used appropriately. There is an inherent risk in the design of the BQM as the airports may have the ability to impact whether boarding passes are scanned or not scanned. To provide the airline community with greater comfort over the results from BQM measured security queues, HAL should provide monthly reporting to illustrate the scan success rate used as the basis for the calculation.	High	*HAL Response:* *Heathrow would like to clarify that there has been no evidence of any manipulation of BQM results across T5 found within the audit. However, we recognise that there could be a perception amongst stakeholders that results could be manipulated.* *Heathrow is happy to explore the potential for the design and build of a report that could be shared with BA to provide a level of reassurance surrounding the penetration rate of BQM within T5 in order mitigate against this potential perception.*
7.1K	Security & Control Posts	**Control post exclusions** There is currently no exclusions available for control post queue times. Whilst it is recognised between HAL and the AOC that there are some events that occur which are out of the control of the airport that could impact upon the control post queue times, the licence is yet to be updated to reflect this. Examples of events which may occur which are outside the control of HAL are non-compliance by airline crews or breakdown of non-HAL vehicles. During the year 2015, there were 6,983 instances of non-compliance by airline crews reported. The absence of control post exclusions presents the risk that HAL are being inappropriately assessed on their control post SQRB results. HAL and the AOC are currently holding discussions within the Technical Review Forum (TRF) to update the control post protocols which may include some exclusions. It is suggested that the HAL and AOC should agree in which instances exclusions are acceptable for control posts. In addition, it is suggested that the list of exclusions as outlined in the licence be reviewed for adequacy and appropriateness on a periodic basis by the CAA, HAL and the AOC.	High	*HAL Response:* *Heathrow agrees with this observation and recommendation and would like the auditors to recommend that the CAA conducts a reviewing of the control post groupings within the licence. We would also like the CAA's support in carrying out a review of the SQ exclusions list and whether it still properly captures the risks to performance that are out of HAL's control.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1L	Passenger Operational and Airline Operational Elements	**The design of SQRB exclusion requests** Since the licence was introduced there has been confusion between HAL and the AOC towards the level of consultation/approval required for SQRB exclusion requests (SERs) as outlined in the service quality consultation protocol that supports the licence. In December 2014 the CAA made a which included a governance structure to deal with SERs. The structure set out that all straight forward SERs would go the Terminal Community Meetings (TCM) for review and approval, whilst the more licence specific issues would be referred to the Technical Review forum (TRF) where the appropriate level of expertise is held to make informed decisions. The determination further explained that SERs would need to be issued to for review seven days prior to TCM or TRMs. The determination by the CAA has gone through several versions and still remains as a draft document. The determination further provided guidance as to the three types of exclusions that would be issued: • Some exclusions would apply automatically when a specific event occurs, (documented in the licence under 2.28 c, d, e, g, h, i and k). should there be challenges they can be raised within the TCM or TRF. • Some require consultation with the community (2.28a, b, l and m). • Others require the agreement of the community on specified matters. (2.28f, j, n and o). Whilst we understand the requirement for three levels of exclusion requirements to assist daily operations, there appears to be a lack of transparency/ challenge built into the governance structures towards automatic exclusions and further a lack of definition as to what qualifies as consultation between HAL and the community.	N/A	Not applicable

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.1M	Passenger Operational and Airline Operational Elements	**Definition for capital works** The licence provides exclusions for major refurbishment work, however there is no definition for what major refurbishment work is. Below is the exclusion as documented within the licence: *'equipment or stands taken out of service for replacement or major refurbishment work, when the timing of work has been determined after consultation with the AOC, and the period specified in advance. If work extends beyond this period, then the additional downtime shall count against the serviceability target.'* The absence of a definition for capital works increases the risk that exclusions are raised where the validity of the exclusion is not adequately scrutinised. HAL in consultation with the AOC should develop an definition for what constitutes a major refurbishment to guide the TCM and TRF on whether consultation or AOC approval is required.	**Medium**	*HAL Response:* *Heathrow have already met with BA and the AOC on this topic. We have jointly identified that there is a need to improve the communication between the capital process and the service quality exclusions process. BA have also said that they will seek feedback from the TCM's as to any concerns or issues with the definition.* *We would caution against any prescriptive definition that could incentivise the wrong behaviours. For example, passenger critical projects do not necessarily equal high value projects.*
7.1N	Passenger Operational and Airline Operational Elements	**Governance and operations of TCM and TRF** To assist oversee the submission and approval of SERs the CAA introduced a governance structure for HAL and the AOC to work together to agree upon the appropriateness of SER requests. The governance structure includes the two below groups who provide some oversight to exclusions: Terminal Community Meeting (TCM) The TCM is responsible for processing and agreeing on terminal specific SERs. The SERs are issued 7 days in advance of TCM meetings. SER requests can be referred to the TRF if there is no resolution or the technical knowledge is not available at the TCM. Technical Review Forum The TRF is responsible for reviewing terminal-specific SERs referred to it by TCMs, SERs submitted directly to the TRF and also for non-terminal specific SERs. Our audit identified that there is a few underlying issues with the current structure that need to be considered. Some points for the consideration of the CAA, HAL and the AOC is documented are documented below • The TCM is operational focused and therefore may not always have the appropriate knowledge to advise on SERs • The agenda of the TCM is heavily focused on operational performance of the individual terminals and which may not always allow for an appropriate level of critic to SERs. • There is no representation from the CAA in decisions making process as bodies in both the TCM and TRF. This can be a problem as the interests of HAL, the AOC and airlines may be conflicting where rebates occur or are avoided as a direct result of SERs. • There is no visibility to whether SERs applied for have a large impact towards the pass/fail of the service element. • SERs rejected by the TCM are not able to be appealed directly to the TRF. The SER	**High**	*HAL Response:* *We broadly agree with the observations. Whilst we agree that the TCM is operational focused and does not necessarily have the knowledge of the Licence, Edwina Silo from the AOC does attend the TRF and TCM's so does provide that continuous thread between the different governance groups. We have also drafted some guidance material to help the TCM members. So over time the knowledge of TCM's should change. We would also add that the TRF is very much regulatory focused and has a much narrower attendance, often only attended by BA and the AOC. Therefore, decision making is hindered with the lack of a representative parties and no agreed quorum on how decisions should be agreed in the absence of consensus,*

Ref	Service element	Observation and Recommendation	Rating	Management comments
		will be resubmitted to the TCM which may cause operational delays. There is no representation from the CAA on either the TCM or the TRF. • The TRF are responsible for reviewing any control post elements, however as the technical review forum is place to focus on regulatory matters with reference to the licence, it may not be best equipped to deal with control post specific operational matters. • There is a perception of a lack of confidence in the appropriateness of service standards exclusions. The CAA should revisit the current governance structure introduced to govern SERs. Some considerations that CAA may take into account are noted below: - The inclusion of an adjudicator on both bodies that is independent to both HAL and AOC - An informal review of the TRF activity on a periodic basis to assist deliberate on any long standing items. - Introduce a group that specifically deals with operational control post issues that includes attendance from HAL operational staff and the AOC. - Aim to improve transparency of SER decisions by providing greater supporting evidence.	**Red**	
7.1O	Aerodrome Congestion Term	**Licence not being followed in practice for ACT communication.** There is a requirement for data collection and communication within the licence surrounding with relation to ACT that is not being followed in practice by HAL. Details of the requirement from the licence are documented below: 2.45c - Report to Relevant Parties the new events that have been recorded each week as soon as practicable after the end of the relevant week on its extranet site or in such other format as may be agreed by the Licensee and Relevant Parties; 2.45d - Report to relevant parties as soon as practicable after the relevant week the calculations of the maximum number of movements deferred for each Material Event set out under paragraphs 2.31 and the assumptions supporting the expected level of arrivals or departures in each hour during the course of the Material Event and any estimate of the Proportion of Responsibility. We identified however that visibility of material events is provided to all key stakeholders via other communication channels e.g. via the ACT working group Without adequate and regular communication of potential material events and the calculation of ACT there is the risk that ACT events are inaccurately classified and/or calculated. The CAA should consult with HAL and the AOC and consider whether the communication channels documented in the licence are still appropriate and update accordingly.	**Medium**	*HAL Response:* *We agree that the communication channels & processes covered by the ACT need to be reviewed and we will consult with the AOC & Airlines to determine what changes, if any are required, and make recommendations to the CA.*

7.2 Airport Operational Processes

The following observations were identified during our review which relate to the way service performance is measured, quality assured and reported by HAL.

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2A	Passenger Satisfaction	**Location of QSM surveys** QSM surveys may not always be completed at the most ideal location to capture the passenger experience at a point in time. i.e. the passengers 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. We sought to understand whether there is any variance in results dependent upon where the passenger is surveyed. HAL has installed 'happy or not' machines at the exit to the security area in each terminal capture real time feedback on the passengers security experience. The 'happy or not' scoring is captured out of four emotion levels whereas the QSM is captured out of five. We conducted an analysis of the results of the happy or not survey compared to the QSM survey from December 2015 across all terminals to see if there was any trends that should be investigated. To complete this task we needed to standardise the happy or not survey results to be rated out of five. Overall we there appears to be good correlation between the results. Below is a summary of the results *table below* *Please note this is not a true representation of any variance in passengers perception of security. This is provided as an example for the consideration of HAL management. HAL may wish to consider conducting their own analysis over a longer period of time to see whether results are varied to investigate there is scope varying results which may present the case to rethink the design of where surveys are conducted.	Low	*HAL Response:* *For consistency, and based on passenger feedback HAL would like to retain the current methodology i.e interviewing passengers at the end of their journey at the airport (Gateroom for Departures, Arrivals Concourse for Arriving passengers). However, as indicated in 7.1E HAL are already investigating ways of capturing feedback via other mechanisms to complement the insight gained from the QSM programme.*

Terminal	Score as per QSM	Score as per happy or not	Variance
2	4.27	4.11	0.16
3	4.27	4.14	0.13
4	4.21	4.29	-0.08
5	4.18	4.29	-0.11

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2B	Passenger Satisfaction	**Inclusion of part completed surveys to calculate monthly passenger satisfaction QSM score** At present any survey that is incomplete will not be included within the calculation of the overall QSM results for arrivals and departures. As a result, the time spent by surveyors is not being reflected through insight captured and included in QSM analysis. HAL should include the results from half completed surveys to ensure that all passenger experiences are captured and assessed.	**Low**	*HAL Response:* *Based on the experience HAL have acquired via the ACI's ASQ programme, we recommend that incomplete interviews are not included in the final results unless passengers provide an overall level of satisfaction result, which is currently captured at the end of the questionnaire.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2C	Passenger Satisfaction, Passenger Operational and Airline Operational Elements & Aerodrome Congestion Term	**Design of key spreadsheets used to assist calculate service element scores** Our audit identified that several key spreadsheets which could benefit from improved spreadsheet controls. Examples of the spreadsheets identified are documented below: _see table below_ It is now widely accepted amongst organisations worldwide that errors in spreadsheets are both common and potentially dangerous. Data integrity is key to ensure data is reliable and accurate and without proper access controls and change management, data in spreadsheets can easily become corrupt or manipulated by end users. We acknowledge that HAL plan to undertake a data project, focussing on systemising the end-to-end service performance calculation and reporting process. In particular HAL are exploring ways in which HAL can directly connect to systems such as Maximo and Boss thus reducing the need for manual data input. There are many controls that can be implemented to ensure data integrity within spreadsheets. These are: • Creating spreadsheet versions for all spreadsheet changes • All changes to a spreadsheet are reviewed and approved. • The validity of spreadsheet inputs should be ascertained • Spreadsheets should reside on file servers and backed up to external media • Spreadsheet files should be protected with some form of access control • Non input related spreadsheet fields are password protected.	Medium	_HAL Response:_ _We agree with the observation. Many of these spreadsheets have been replaced and transitioned to a new central protected location._

Element	Spreadsheets
Passenger Satisfaction	SQR Weighted Apr-08 onwards_Dec15
Train Transit System	TTS SQR 2015-2016
FEGP and SEGs	FEGP SEGs Trigger Report
Jetties, PSE (General) and PSE (Priority)	SQR Report
Arrivals Reclaim Carousel	SQRB Report
Stand Availability	Stand Outage Report
Pier Served Stands	SQR Report
ACT	Monthly superlog file

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2D	Aerodrome Congestion Term	**Development of expected arrivals and departures calculation** At the commencement of this audit (January 2016) the current measure of expected arrivals and departures was calculated from an eight week average from National Air Traffic Services (NATS) provided data. HAL is implemented a new calculation method which is believed to provide a more accurate forecast. The new model will contain all historical data for expected arrivals and departures from NATS and be contained within an access database. The calculation will then be completed each month based on the following rules: prior year, same month, same working day actuals as the forecast. It is expected that this new measure will be introduced by April 2015. When rolling out the new method of calculation HAL should ensure the methodology for determining expected arrivals and departures includes variables such as public holidays and holidays.	Low	*HAL Response:* *We agree with this observation*
7.2E	Security & Control Posts	**Quality assurance of third party manual recording** HAL utilise the services of Wilson James to record the security queue times for staff search across all terminals and T5 transfers. At present there is currently no form of quality assurance completed on the queue times that are captured by Wilson James. Without quality assurance over queue recording completed by Wilson James there is an increased risk that queue times are inaccurately captured. HAL should create a quality assurance framework to validate that accurate security queue times are being recorded by Wilson James.	Medium	*HAL Response:* *Heathrow Security have agreed a number of actions to improve the level of assurance for the third party supplier (Wilson James):* *The ownership of the contract will transition from APOC to Security upon the renewal date of August 2016. This will include a full review of Heathrow requirements and expectations moving forward due to operational changes within T5 in regard to queue timing technology.* *The recently recruited Performance Manager will be responsible for providing assurance for Wilson James queue times. An appropriately designed assurance package will be developed and implemented to validate the work of Wilson James.*
7.2F	Security & Control Posts	**Inconsistencies between Security and Control Posts** At present quality assurance activities to update queue times are inconsistently applied across the terminals and campus security. Campus security apply overrides to queue times by recording the longest 15 minute queue during a 15 minute timeslice from three vehicle queue times within the timeslice, whereas security captures three individuals across the 15 minute timeslice and record the average of the three queue times as the updated queue time in the OPM system. HAL is aware and looking to standardise the approach for recording queues and conducting quality assurance as the same system is used to record data (OPM) HAL is aware of this gap in the process undertaken and has identified the standardisation of processes as an improvement activity which will be actioned after this audit is completed.	Low	*HAL Response:* *With Campus Security now forming part of the overall Security function, we have recognised that processes should be aligned where possible to provide consistency across reporting measures. Work will continue through 2016 progressing with areas that can be aligned and would welcome support in appropriate forums to progress this where possible*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2G	Security & Control Posts	**Availability of CCTV to substantiate security and control post queue times** At present CCTV footage to assist substantiate security queue times is either not available or only retained for 30 to 90 days. The absence of CCTV footage reduces the ability to provide assurance that queue times are accurately captured upon challenge from the AOC or airlines. HAL may wish to keep video data for a longer period of time in the event that accuracy of security queue recording is challenged by the AOC or audited.	**Medium**	*HAL Response:* *Heathrow has recently increased the CCTV retention period for cameras associated with queue timing to 90 days within the system's memory. In the event that a challenge is received within the TCM's, Heathrow has the facility to burn the footage to disc and store for the time until a query is resolved. The current reporting structure facilitates any challenges within the 90 day window. The implementation of the measure improves consistency across the airport and reduces manual intervention within the CCTV system thus improving data protection measures whilst still ensuring that any queries can be resolved.*
7.2H	Passenger Operational and Airline Operational	**Inconsistent approach to analyse asset downtime.** Our work identified an inconsistent approach for calculating the asset availability for across some of the assets measured under the SQRB regime. The majority of all downtime for assets is recorded within Maximo using a consistent approach with the exclusion of stands and arrivals baggage carousel which adopt differing approach/systems to calculate. Reports detailing asset downtime are directly extracted from the Maximo system, however for the majority of assets the method to calculate the downtime from the extracted reports differs. HAL should introduce a consistent methodology across all assets (where possible). HAL is aware of the inconsistent approaches adopted and has identified the standardisation as an improvement opportunity which will be actioned after this audit is completed.	*Low*	*HAL Response:* *We are currently revising the process to produce a single output file, for all of the maximo elements. At the moment this does not include the baggage elements but we will look to see if baggage can be included in this revision.* *We will be looking at developing a standardised approach for calculating downtime from the extracted report above.* *Whilst the availability of stands is recorded in IDAHO, we will also look to see if this approach can be extended to stands.*
7.2I	Passenger Operational and Airline Operational	**Lack of evidence to substantiate automatic exclusions for asset availability** The HAL Q6 determination provides guidance for HAL when exclusions are raised on whether they are automatic, require consultation with or require approval. Whilst it is understood that in some circumstances there is no requirement for an automatic exclusion to obtain approval, our audit identified that no evidence to support automatic exclusions is retained for asset availability service elements. The absence of evidence to support automatic exclusions increases the risk that inappropriate exclusions are processed without adequate challenge or oversight. HAL should to introduce a mechanism to provide greater transparency surrounding automatic exclusions to the AOC.	**Medium**	*HAL Response:* *Heathrow agrees that there is a requirement to provide greater transparency through the TCM's on automatic exclusions. The CAA have said they plan to update their guidance on exclusions therefore it seems prudent to wait until the CAA issue this guidance Once this guidance has been issued we will work with the AOC on what further information should be provided.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2J	Passenger Operational and Airline Operational	**Availability of quality assurance checklists** As part of our work we tested a sample of end product checks to validate that end product checker checked to see that the work order downtime was accurately recorded. 16 from a sample of 25 end product checks did not have evidence of the end product check completed. (Refer to Appendix G for further details) HAL should ensure that when end product checks are completed that documentation of the completion is retained in Maximo to evidence the check was completed.	Low	*HAL Response:* *We are also investigating the possibility of transferring the template into a Maximo Log (hard coded).*
7.2K	Passenger Satisfaction, Passenger Operational and Airline Operational Elements & Aerodrome Congestion Term	**No independent review of calculations prior to submission** We were unable to obtain any evidence of an independent review conducted on the preliminary results for all service elements with the exception of stand availability. HAL is in the process of introducing a centralised database to store all the SQR results that will remove some of the manual processes and put the responsibility back on the individual element owners to submit the accurate monthly scores. As part of the new process the provisional scores which will require an independent review of the provisional scores to be documented within the SQR database. An absence of independent reviews of SQRB score calculations increases that risk that erroneous calculations are processed and scores are inaccurately published. The process was trialled during January 2016 for the first time across the majority of all service elements with the expectation of all service elements to be included within Q6.	Medium	*HAL Response:* *We agree with your summary of the process improvements we have put in place.*
7.2L	Passenger Operational and Airline Operational	**Quality assurance on contractor works** There is currently no quality assurance activities completed on work orders undertaken by contractors. Whilst end product checks are completed on direct labour staff, the process has not been duplicated to third party contractors working at HAL. Without quality assurance completed on work orders undertaken by contractors there is an increased risk that work orders are inaccurately categorised and further downtimes are inaccurately captured. HAL should replicate the end product check process in place for direct labour to the contractor workforce who complete work orders on behalf of the airport.	Medium	*HAL Response:* *Heathrow Engineering & asset Management Contracts manager will implement the end product check process against our supplier base.*

Ref	Service element	Observation and Recommendation	Rating	Management comments
7.2M	Passenger Operational and Airline Operational	**Variances between the asset downtime as per the monthly supporting calculation and the downtime recorded within Maximo.** Our testing conducted on a sample of 25 work orders identified Six work orders variances in actual vs. reported downtime which occurred due to human error whilst HAL processes were changed in April 2014. At this time, Maximo was upgraded in Feb 2014 from 5.4 to 7.2 which resulted in downtime recording functionality not working as expected, this issue was identified in April 2014 and a fix deployed, however this meant also, all business unit staff need to be trained upon the revised process for downtime, which was delivered over the May to December period. During this period downtime, further assurance checks were put in place for ensuring all downtime was accurately captured, which meant a degree of downtime being manually entered into Maximo. These variances increased the overall downtime resulting in a reduced asset availability score achieved by HAL. One work order variance was due to downtime incorrectly recorded within Maximo and was manually updated on the monthly supporting calculation spreadsheet. Alongside on-going training for Maximo users, HAL should communicate the importance of recording accurate downtime within the Maximo system to all individuals (direct labour and contractors) with systems access.	Low	*HAL Response:* *Heathrow agrees with this observation.*

Appendix A – Audit requirements

The Request for Quotation received from the Civil Aviation Authority included the following audit procedures, which were performed as part of our review.

Objectives of the audit
The objectives of the audit were:

- 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.

Audit procedures
Passenger Satisfaction
The audit shall focus on the QSM measurement of the elements in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport:

Heathrow	Gatwick
Departure lounge seating availability, Cleanliness, Way-finding, Flight information, Security, Wi-fi	Departure lounge seating availability, Cleanliness, Way-finding, Flight information

The audit shall:
- 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

- review whether in the opinion of the Auditors 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

- 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.

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

Security and Control Posts
The audit shall focus on these security elements in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport:

Heathrow	Gatwick
Central search, Transfer search, Staff search, Control posts (CTA, Cargo, Eastside, Southside, Terminal 5)	Central passenger search, transfer passenger search, Staff search (Terminals and Crew), External control posts search

The audit shall report on:

- 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

- 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 meet the operational needs of the airlines/passengers

- whether there are more effective, accurate or robust measures of service performance, including (where appropriate) suggesting proven systems that are used at other airports.

Passenger Operational and Airline Operational Elements
The audit will consider the procedures and systems for measuring availability of the assets set out in the SQRB scheme at Heathrow Airport and in the CSS(R) scheme at Gatwick Airport.

Heathrow	Gatwick
Passenger sensitive equipment (general), Passenger sensitive equipment (priority), Arrivals baggage carousels, Track transit system, Stands, Jetties, Fixed electrical ground power, Stand entry guidance, Pre-conditioned air, Pier-served stand usage	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.

Aerodrome Congestion
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

- whether in the opinion of the Auditors 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

- whether subject to the above the rebates have been properly calculated

- whether there are more effective, accurate or robust measures of service performance, including (where appropriate) suggesting proven systems that are used at other airports.

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.

Airline Service Standards (Gatwick Airport only)
The audit shall give an objective opinion on:

- the effectiveness of the monitoring of arrivals bag performance, in particular the robustness of data collection and calculation of airline performance

- the provision of adequate information to airlines and to the CAA on the amounts paid and dates of payments.

Calculation and Payment of Bonuses (Heathrow Airport only) and Rebates
The audit shall give an objective opinion on:

- 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

- the robustness of the calculations of rebate reduction due to airlines not meeting the airline service standards (Gatwick Airport only)

- 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.

Publication of Service Performance
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.

Appendix B – Security queue time methodology overview

Terminal	Security Category	In-Count	Out-Count	Methodology	Responsible Party
Terminal 2	Central Search	ATP	WTMD	AQM	HAL
	Transfer Search	Lasers	WTMD	AQM	HAL
	Staff Search	N/A	N/A	Enhanced Manual	Wilson James
Terminal 3	Central Search	Lasers & BT	WTMD	AQM	HAL
	Transfer Search	Lasers	WTMD	AQM	HAL
	Staff Search	N/A	N/A	Enhanced Manual	Wilson James
Terminal 4	Central Search	Lasers & BT	WTMD	AQM	HAL
	Transfer Search	Lasers & BT	WTMD	AQM	HAL
	Staff Search	N/A	N/A	Enhanced Manual	Wilson James
Terminal 5	Central Search	ATP	BQM Terminal	BQM (Average)	HAL
	Transfer Search	N/A	N/A	Enhanced Manual	Wilson James
	Staff Search	N/A	N/A	Enhanced Manual	Wilson James

ATP = Automatic Ticket Presentation, WTMD = Walk through metal detector, BT = Bluetooth, BQM = Barcode Recognition, AQM = Automatic Queue Measurement (Little's Law), Enhanced Manual = CCTV manual recording

Appendix C – Passenger Satisfaction variances due to calculation method

Date	Terminal	Attribute	Score Category	Reported as per Passenger Experience Team	SQR Weighted Apr08_onwards spreadsheet	Rebate	Variance
Apr-14	Terminal 1	Security	MAA score	4.04	4.03	4.04	-0.01
Apr-14	Terminal 5	Security	MAA score	4.05	4.09	4.05	0.04
May-14	Terminal 5	Security	MAA score	4.05	4.09	4.05	0.04
Dec-14	Terminal 4	Security	MAA score	4.12	4.11	4.12	-0.01

Appendix D – Passenger Satisfaction variances due to spreadsheet formula error

Date	Terminal	Attribute	Score Category	Reported as per Passenger Experience Team	SQR Weighted Apr08_onwards spreadsheet	Rebate spreadsheet	Variance
Apr-14	Terminal 5	Security	Monthly score	4.11	4.12	4.11	0.01
Apr-14	Terminal 5	Security	MAA score	4.05	4.09	4.05	0.04
May-14	Terminal 5	Security	Monthly score	4.04	4.09	4.04	0.05
May-14	Terminal 5	Security	MAA score	4.05	4.09	4.05	0.04
Dec-14	Terminal 4	Security	MAA score	4.12	4.11	4.12	-0.01

Appendix E – Passenger Satisfaction variances due to Finance input errors

Date	Terminal	Attribute	Score Category	Reported as per Passenger Experience Team	SQR Weighted Apr08_onwards spreadsheet	Rebate spreadsheet	Variance
Apr-14	Terminal 1	Security	Monthly score	4.06	4.06	4.04	0.02
May-14	Terminal 3	Security	Monthly score	4.17	4.17	4.09	0.08

Appendix F – Passenger Satisfaction variances due to rounding errors

Date	Terminal	Attribute	Score Category	Reported as per Passenger Experience Team	SQR Weighted Apr08_onwards spreadsheet	Rebate spreadsheet	Variance
Apr-14	Terminal 5	Wifi	Monthly score	3.87	3.86	3.87	-0.01
May-14	Terminal 3	Security	MAA score	4.09	4.10	4.09	0.01
May-14	Terminal 5	Wifi	Monthly score	3.73	3.72	3.73	-0.01

Appendix G – No evidence of end product check available

Work order	Asset Number	Description	Change By	Change Date	Downtime	Exclusion Reason	WO_DESCRIPTION
WO-153618	82050009	Fixed Electrical Ground Power-Transformers-Stand 538 -	AARON_WROOT@BAA.COM	4/17/2014	8.82	No Fault Found	STAND 538 - FEGP FAULT - NO POWER
WO-175449	82011565	T5B - PRE-CONDITIONED AIR UNIT 546A	DARREN_SHERIDAN@BAA.COM	05/08/2014	0.37	No Fault Found	AB546A - PCA HOSE HANGING DOWN UNDER JETTY-
WO-1255517	10707109	Stand 325 - FEGP CUB Crocodile	TOBIAS_JONES@BAA.COM	12/23/2014	2.85	Damage or Misuse	T3 STAND 325 NO POWER ON LEAD 3 FEGP THERE IS AN AIRCRAFT ON STAND WAITING TO DEPT.
WO-1269453	6566408	SHELL - AIR-T3 - Stand 305 - Fixed Electrical Ground Power	MOHAMMED_KASHMIRI@BAA.COM	1/7/2015	28.6	Damage or Misuse	T3 - STAND 305A - FEGP FAULT - NO POWER -
WO-1321135	10316561	Fixed Electrical Ground Power-Transformers-Stand 406	PETER_MILLS@BAA.COM	2/22/2015	5.23	Damage or Misuse	T4 - FEGP - 406 - NO POWER
WO-1381446	10707367	STAND 557 - FEGP CUBICLE 2	MOHAMMED_KASHMIRI@BAA.COM	4/19/2015	2.87	Damage or Misuse	STAND 557-T5-NO POWER TO THE AIRCRAFT- ALL GREEN LIGHTS ARE ON
WO-1417274	10226791	SHELL - AIR-T5 - Stand 575 - Fixed Electrical Ground Power	PAUL-LHR_SHEPPARD@BAA.COM	5/23/2015	1.5	Damage or Misuse	T5C STAND 575 FEGP LEADS 1 AND 2 U/S
WO-1384812	82184540	SHELL - AIR-T5 - Stand 554 - Fixed Electrical Ground Power	DEREK_COOMBES@BAA.COM	4/22/2015	2.67	No Fault Found	STAND 554 - FEGP - NO POWER - OOS
WO-1411066	89066850	MSCP2 - Passenger Lift - LIFT E10 - L33615	ALEX_ROOKS@BAA.COM	5/16/2015	0.33	No Fault Found	MSCP2 - Passenger Lift - LIFT E10 - L33615 - LIFT ENTRAPMENT -
WO-1409857	10413370	T2B - Aircraft Passenger Boarding Bridge - Stand 233A - (L31954)	NATHAN_BUTCHERS@BAA.COM	5/15/2015	0.12	No Fault Found	T2B JETTY 233A NO MOVEMENT AWAITING BOARDING

Work order	Asset Number	Description	Change By	Change Date	Downtime	Exclusion Reason	WO_DESCRIPTION
WO-1491851	6501960	SHELL - AIR-T3 - Stand 320 - Fixed Electrical Ground Power	MICHAEL_WILDMAN @BAA.COM	7/15/2015	2.10	Damage or Misuse	STAND 320 FEGP PLUG HAS MELTED - AIRCRAFT ON STAND
WO-1473853	6502312	SHELL - AIR-T3 - Stand 326 - Fixed Electrical Ground Power	PAUL-LHR_SHEPPARD@B AA.COM	6/30/2015	1.00	No Fault Found	STAND 326 - FEGP - POWER KEEPS TRIPPING
WO-1497850	10706923	STAND 317 - FEGP CUBICLE 1	SHARIF_HAMEED@ BAA.COM	7/20/2015	0.07	No Fault Found	Investigate Tripping with M.Kirby
WO-1522185	6566360	SHELL - AIR-T3 - Stand 307 - Fixed Electrical Ground Power	AARON_WROOT@B AA.COM	08/09/201 5	0.22	Damage or Misuse	T3 - STAND 307 - FEGP - ONE SOCKET DAMAGED
WO-1609221	6501864	AIR-T3 -Stand 325 - Fixed Electrical Ground Power	GLYNN_THRUMBLE @BAA.COM	10/20/201 5	0.07	No Fault Found	325 FEGP LANYARD MISSING OOS
WO-1627496	6503336	SHELL - AIR-T4 - Stand 420 - Fixed Electrical Ground Power	SHARIF_HAMEED@ BAA.COM	11/04/201 5	1.17	No Fault Found	T4 - STAND 420 - FEGP - NO POWER - AJ875

Appendix H – Security queue variances due to timing issues

Sample Month	Sample Terminal	Element	Metric	Target Score	Failures as per SPR Report	Percentage SPR	Failures as per OPM support	Published Score
Aug-14	Terminal 3	Central Search (interim)	% of queue times measures once every 15 minutes that are less than 5 minutes	95.00%	93	95.71%	88	95.94%
Jul-15	Terminal 3	Central Search (interim)			80	96.31%	79	96.31%

Appendix I – Security queue variances due to human errors

Sample Month	Sample Terminal	Element	Metric	Target Score	Failures as per SPR Report	Percentage SPR	Failures as per OPM support	Published Score
Jun-14	Terminal 5	Central Search (interim)	% of queue times measures once every 15 minutes that are less than 10 minutes	99.00%	N - 13 S - 8	99.50%	N - 13 S - 8	99.48%
Oct-14	Terminal 4	Staff Search (interim)	% of queue times measures once every 15 minutes that are less than 10 minutes	95.00%	T4D - 0 T4A - 7	99.84%	T4D - 0 T4A - 7	99.68%

Appendix J – Control Post CCTV footage unavailable

Date	Control Post	Time of Breach	Duration of Breach	Camera No.	V1 Description	V1 Enter Lane	V1 Enter Search	V1 Time Taken
14/01/2016	CP24	22:29:00	00:15:43	40795	white car	22:18:40	22:29:29	00:10:49
24/01/2016	CP16	10:57:14	00:31:46	70166	babcock	10:50:04	10:50:36	00:00:32
30/01/2016	CP10A	14:08:04	00:15:41	40795	flatbed	14:00:53	14:01:28	00:00:35

Appendix K – Control Post Breach discrepancies

Month	Control Post	Error Type	Variance between SPR Report and OPM
Oct-14	Cargo	Human Error	1
		OPM Archive Technical Issue	2
Dec-14	Cargo	Human Error	2
		OPM Archive Technical Issue	7
Apr-15	Cargo	Human Error	6
		OPM Archive Technical Issue	1
		Manual Queue Timing	6
Sep-15	Southside	Human Error	1
Mar-15	Cargo	OPM Archive Technical Issue	1
Jul-14	Eastside	OPM Archive Technical Issue	6
Aug-14	Eastside	OPM Archive Technical Issue	2
Dec-14	Eastside	OPM Archive Technical Issue	2
Nov-14	Eastside	OPM Archive Technical Issue	2
		Manual Queue Timing	1
Dec-14	T5	OPM Archive Technical Issue	1
Apr-15	Cargo	Manual Queue Timing	2
			2
			2
Jul-15	Southside	Manual Queue Timing	8

Appendix L - Definition of ratings

Within each report, 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 audit reports across the alliance and similarly allows for easy comparison to previous reports.

Finding rating	Description	Features
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
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)
Low	Findings that identify non-compliance with established procedures.	• Minor control weakness • Minor non-compliance with procedures / standards

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