



# **Office of the Adjudicator – Broadcast Transmission Services**

**Report for the period 1 October 2017 – 31 December 2017**

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## 1. Background

On 11 March 2008, the Competition Commission (CC) announced its decision to allow the merger of transmission companies Arqiva and National Grid Wireless (NGW) subject to the agreement of a package of measures (undertakings) to protect the interests of their customers.

Arqiva and NGW overlap in the provision of Managed Transmission Services (MTS) and Network Access (NA) to transmitter sites and associated facilities for terrestrial television and radio broadcasters. In its final report, the CC found that Arqiva and NGW were the only active providers of MTS/NA to the UK television broadcasters. The companies were also the most significant providers of national MTS/NA to UK radio broadcasters with a combined market share of more than 85%. In both cases, prior to merger, the companies had exercised a competitive constraint on each other.

**The CC concluded the merger of the two companies would lead to a “substantial lessening of competition” in broadcast transmission services**, specifically in the provision of MTS/NA to television and radio broadcasters.

After consultation by the CC with Arqiva, its customers and other stakeholders, the Commission accepted certain undertakings from Arqiva on 1 September 2008.

[http://webarchive.nationalarchives.gov.uk/20140402141250/http://competition-commission.org.uk/inquiries/ref2007/macquarie/pdf/notice\\_undertakings.pdf](http://webarchive.nationalarchives.gov.uk/20140402141250/http://competition-commission.org.uk/inquiries/ref2007/macquarie/pdf/notice_undertakings.pdf)

The Undertakings are intended to mitigate the substantial lessening of competition by protecting existing and new customers over the terms and conditions of supply, including protection against future price rises and protection against changes in non-price related areas (such as discrimination issues and service standards).

The Undertakings provide for the appointment of an Adjudicator, as described in Appendix 1 (Adjudication Scheme) and Appendix 2 (Adjudication Rules). The main role of the Adjudicator is to determine disputes arising out of the operation of the Undertakings.

Paragraph 35 of Appendix 1 to the Undertakings requires the Adjudicator to make periodic reports to the Office of Fair Trading (now the Competition and Markets Authority), copied to Ofcom, covering the following points:

- Any Guidance issued
- Determinations in relation to Disputes
- The views of the Adjudicator about the operation of the Undertakings, the Adjudication Scheme and Adjudication Rules as well as any recommendations for amendments
- The views of the Adjudicator on the performance of Arqiva in complying with the Undertakings

This report covers the operation of the Office of the Adjudicator over the period from 1 October 2017 to 31 December 2017. This report will be published on the website of the Adjudicator ([www.adjudicator-bts.org.uk](http://www.adjudicator-bts.org.uk)) with any information that the Adjudicator regards as confidential redacted.

## **2. Office of the Adjudicator**

### **2.1 Adjudicator**

The Office consists of Alan Watson as Adjudicator and Jon Butler as Deputy, both are part time. Megan Donald is Executive Assistant and Office Manager, also on a part time basis.

Legal advice is provided by Mr Paul Herbert of Goodman Derrick LLP.

Office facilities and IT support are provided by Ofcom. From mid-October, Ofcom will no longer provide an office, however Megan Donald will continue to be located at Ofcom.

### **2.2 Budget**

The operational budget for 2017/18 is £476,476 with a contingency of £470,000.

Expenditure to the end of December in the present financial year is £278,482 with no recourse to contingency.

### **2.3 Stakeholder Meetings**

During this period regular meetings and communication with stakeholders have continued and include government departments, television broadcasters and radio broadcasters, both large and small:

Confidential information redacted

### **2.4 Arqiva**

Paragraph 35 of Appendix 1 of the Undertakings requires the Adjudicator to comment on the performance of Arqiva over this period, in relation to the Undertakings.

The performance of Arqiva continues to be generally satisfactory.

### **3 Disputes and Guidance**

#### **3.1 Guidance**

In this period there have been no disputes requiring the use of the formal dispute procedure.

### **4 Publication of Reference Offers.**

Reference offers for Ipswich, Bristol and Torbay radio licences have been published in this period and can be found at:

<https://www.arqiva.com/documentation/reference-offers/>

The radio rate card for site access can be found at;

[https://www.arqiva.com/documentation/reference-offers/broadcast-radio/Argiva Radio Rate Card for Network Access 2017-18.pdf](https://www.arqiva.com/documentation/reference-offers/broadcast-radio/Argiva%20Radio%20Rate%20Card%20for%20Network%20Access%202017-18.pdf)

### **5 Reporting and Audit**

#### **5.1 Regulatory Accounts**

Arqiva is obliged to produce annual accounts in accordance with the requirements set out in Paragraph 15 and Appendix 14 of the Undertakings.

The accounts for the period 1 July 2016 to 30 June 2017 have been produced and approved and are available at:

<https://www.arqiva.com/documentation/regulatory/>

The Regulatory Accounting Principles and Methodologies (RAPAMS) which set out how the accounts are produced and are approved by the Adjudicator can be found at the above link.

## **5.2 Compliance Report**

Paragraph 18.1 of the Undertakings requires Arqiva to deliver an annual report to the Office of Fair Trading (now the Competition and Markets Authority) setting out steps taken to comply with the Undertakings and details of any breaches and including steps taken to remedy them.

The 2017 report has been delivered to the CMA, Ofcom and the Adjudicator. There were no instances of non-compliance.

## **5.3 The Undertakings**

The Adjudicator believes that the Undertakings, the Adjudication Scheme and Adjudication Rules are satisfactory at the present time and that no changes are needed.

## **5.4 Information Security Strategy**

Paragraph 16.2 of the Undertakings requires Arqiva to produce an Information Security Strategy which defines the measures to be taken to ensure that confidential information held in one part of the company cannot be used by another for commercial advantage.

The Information Security Strategy can be found at:

<http://www.arqiva.com/documentation/corporate/arqiva-information-security-strategy-version-1.0.pdf>

An audit of the information security strategy has been conducted and the detailed report is an Annex to the Jan-Mar Adjudicator's report.

# **6 Planned future activity**

## **6.1 Guidance**

The Adjudicator has previously issued guidance covering Paragraphs 6 and 9-12 of the Undertakings. The Adjudicator considers that no further guidance is currently required in relation to Paragraph 6 of the Undertakings.

At present the Adjudicator is of the opinion that no Guidance is required in relation to Paragraph 3 of the Undertakings. Application of, and compliance with, this paragraph will be monitored and Guidance issued at a later date if necessary.

The Adjudicator holds a series of documents produced by Ofcom which cover detailed guidance for the production of reference offers. Some of this is specific to the now historic high power DTT reference offer and so the Adjudicator has now prepared and published a summary document which covers the aspects which constitute current guidance.

<http://www.adjudicator-bts.org.uk/guidance.htm>

## 6.2 Audits

As noted in 5.4 above, the information security audit has been completed.

Arqiva use a database system called KEEP to maintain site infrastructure records. The KEEP database records a variety of site data which includes information relating to the height, type and location of antenna systems. Antenna information from KEEP is used to determine the loading which the antenna system places upon the site mast or tower. This loading (windloading) is used to calculate a part of the charges to the users of the antenna systems.

In March 2016, the Office of the Adjudicator BTS undertook the first audit of the accuracy of the KEEP data, the second audit was undertaken in June 2016. Twelve transmitter sites were visited for the assessment of 1343 antennas, the electricity use of 56 transmitter systems and the accommodation allocated to 12 transmitter systems. The audit tests showed that 256 antenna observations were not reasonably consistent with the KEEP records while both the electricity use and accommodation use were reasonably consistent with Arqiva's records. The 256 antennas were predominantly microwave dishes for non-broadcast use and while these data inconsistencies may impact the calculation of some charges to Broadcasters the overall impact was found to be minimal.

In May 2016 Arqiva produced an action plan to address inconsistencies in the antenna records and in September 2017 a third audit of six sites was undertaken by the Adjudicator. The selection of these six sites includes two which were included in a previous audit, two which had been surveyed by Arqiva and two which had neither been audited or surveyed.

The site observations in the September 2017 audit showed a similar number of discrepancies to Arqiva's KEEP records when compared to previous audits in March 2016 and June 2016. In the September 2017 audit, 743 site observations were compared to Arqiva's KEEP records. Of these 743 antennas, 136 were recorded as not reasonably consistent with Arqiva records

Arqiva worked with the Adjudicator in the analysis of the findings and note that ... *'Despite positive action since the last audit, Arqiva is disappointed that this audit has picked up several data record issues and we recognise that there is still work to do to carry on improving our antenna data records. We note that the observations have a very small impact on some customer charges, both positive and negative.....'*

The audit report is provided as an annex to this document.

### **6.3 700 MHz clearance.**

The Adjudicator has no formal role in the 700MHz clearance programme but some aspects do come within the remit.

### **6.4 Analogue Radio.**

The BBC have announced a plan to close 13 Medium Wave (MF) transmitters. Some of these sites are shared with other broadcasters. The Adjudicator has investigated the implications of the closure to the BBC and other broadcasters, and, to date, has not found any issues which require intervention from the Adjudicator.

## Audit of Arqiva site records undertaken in September 2017

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This redacted version of the report removes information which is commercially sensitive to Arqiva.





Version No	Date	Modified by	Notes
0.1 Redacted	14/12/17	J Butler	First draft for comment, ✂ indicates redaction
0.2 Redacted	11/1/18	J Butler	Minor update and Arqiva response
0.3 Redacted	12/1/18	J Butler	Minor update
1.0 Redacted	15/1/18	J Butler	Final version

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## 1. Document Purpose

The purpose of this document is to;

- 1.1. Set out the findings from the third audit of a selection of Arqiva's sites undertaken in September 2017, for the purposes of;

- 1.1.1. To compare the antenna systems observed at six Arqiva sites to the information recorded in Arqiva's electronic database (the KEEP database), and

- 1.1.2. To include some sites which have previously been audited and/or been the subject of Arqiva's own reviews, and compare to previous findings.

While previous audits have included tests of electricity use and accommodation charges, this September 2017 audit was limited to antennas. Findings from previous audits of electricity use and accommodation charges were reasonable and so have not been repeated.

The findings from this September 2017 audit are summarised in section 9 of this document.

- 1.2. To show the impact of any discrepancies upon the charges to Arqiva's customers and to provide an update on the actions undertaken by Arqiva since the 2016 audits.

## 2. Summary

- 1) The six sites chosen for this September 2017 audit fall into three categories. For each category, one main station and one relay station were selected. The categories and sites are shown below;
  - a) Two sites which have been part of a previous audit and which have been reviewed by Arqiva. Hannington and Salisbury.
  - b) Two sites which have not been part of a previous audit and which have been reviewed by Arqiva. Sutton Coldfield and Leamington Spa.
  - c) Two sites which have not been part of a previous audit and which have not been reviewed by Arqiva. Ridge Hill and Malvern.
  
- 2) The transmitter site observations in this September 2017 audit showed a similar number of discrepancies to Arqiva's KEEP records when compared to previous audits in March 2016 and June 2016. In this September 2017 audit, 743 site observations were compared to Arqiva's KEEP records. Of these 743 antennas, 537 were recorded as reasonably consistent with the Arqiva records, 136 were recorded as not reasonably consistent with Arqiva records and 70 were recorded as observations.
  
- 3) Of the 136 records which were not reasonably consistent with observations, 40 are inconsistencies which do not affect windloading or charges. Such as, the leg of the mast or structure to which the antenna is mounted. There remain 96 antennas with inconsistencies which may impact windloading or charges.
  
- 4) In consideration of the inconsistencies, Arqiva report that;
  - a) The KEEP database reflects the commercial status of each antenna rather than the physical status. If an antenna is part of an active project the commercial status may differ from the physical status. For example, an antenna classified as 'Reserved' in KEEP may or may not be present on the structure if it is part of an active project and while updates to the KEEP database are in progress. Irrespective of the antennas physical presence, it is included in the windloading and cost sharing calculations.
  - b) Of the 96 antennas with inconsistencies which may impact windloading calculations, 35 are antennas within an active project and where the KEEP status will be later updated to reflect the physical status.
  - c) The 35 antennas which are part of an active project are accounted for in Arqiva's windloading calculations and therefore do not impact charges to broadcast customers.
  
- 5) Arqiva have analysed the antenna records discrepancies and have calculated the potential impact on customer charges through changes to the apportionment calculations. The following summary has been established from the Arqiva analysis.
  - a) The changes lead to both small increases and small decreases to charges per site per service.
  - b) The analysis of the discrepancies is site specific and does not result in common changes that can be implemented more widely across further sites.

- c) Arqiva will implement the corrections for the specific sites already identified and will also follow up other on-going initiatives that will review and update the KEEP data.
  - d) For the services on the sample sites the changes to charges for the customers will be implemented under the terms of the relevant customer contract.
  - e) Across all six sites the antenna discrepancies excluding on-going projects are limited, equating to an undercharge of ~~3~~% in pass through charges and an overcharge of ~~3~~% in non-pass through NA charges.
- 6) Arqiva provided satisfactory responses to questions raised during the site audits.

### 3. Introduction

The first site audit was undertaken in March 2016 at six transmitter sites in the West Country and South Wales. This included the identification of 602 antennas, reviewing electricity usage of 26 transmitter systems and the accommodation allocated to four transmitter systems.

The second site audit was undertaken in June 2016 at 6 transmitter sites in the West Country and the South of England. This included the identification of 741 antennas across six sites (seven structures), reviewing electricity usage of 30 transmitter systems and the accommodation allocated to eight transmitter systems.

The accommodation and electricity usage were found to be satisfactory<sup>1</sup> and these tests were not repeated in the September 2017 audit.

- I. The antenna findings from the first audit were that of the 602 antennas, 421 were recorded as reasonably consistent with the Arqiva records, 128 were recorded as not reasonably consistent with Arqiva records and 53 were recorded as observations.
- II. The antenna findings from the second audit were that of the 734 antennas, 520 were recorded as reasonably consistent with the Arqiva records, 128 were recorded as not reasonably consistent with Arqiva records and 66 were recorded as observations.

The representative of the Office of the Adjudicator BTS produced a report<sup>2</sup> of these findings and Arqiva provided a written response. Arqiva's response acknowledged the findings in the audit report and they committed to implement an action plan to address the findings.

Arqiva produced an action plan dated 13 May 2016 which included, but was not limited to:

1. Investigating the causes for the data inconsistencies including people, processes and systems
2. Considering more site audits to determine whether the sample is representative across the Arqiva portfolio.
3. Implementing a plan to correct the inconsistencies including timescales, deliverables, reporting, communications and measurement.
4. Informed by 1-3 above, proposals for subsequent audit activity covering the wider Arqiva Broadcast site portfolio based on an appropriate site selection criteria and for follow up monitoring

Item 2 above considers more site audits, which the Adjudicator agreed to, and this report summarises the outcomes of this third set of site audits.

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<sup>1</sup> At the time of the audit, two systems were highlighted where the records showed higher electricity charges compared to similar systems in use by other customers. These differences were satisfactorily explained and were due to the averaging of electricity use across similar sites through agreements with customers.

<sup>2</sup> Final report v1.0 dated 20 May 2016 and published by the Adjudicator

### *3.1. Antenna Systems*

Arqiva use a database system called KEEP to maintain site infrastructure records. The KEEP database records a variety of site data which includes information relating to the height, type and location of antenna systems. Antenna information from KEEP is used to determine the loading which the antenna system places upon the site mast or tower. This loading (windloading) is used to calculate a part of the charges to the users of the antenna systems.

Some of the elements of the charges to broadcasters are based on the percentage wind load on the structure of the antennas delivering the broadcasters service. The relevant elements of the charges to Arqiva's broadcast customers are influenced by all antennas on a structure irrespective of whether the antenna is for a broadcast service or something else. As such, the accuracy of all antenna records are considered in this audit.

The accuracy of the KEEP records in regard of antenna type and antenna height is the subject of this report for all antennas at a selection of sites. The accuracy of the KEEP records is established through visual site inspection and from analysis of photographs taken at the time.

#### 4. Analysis methodology

The six sites chosen for this September 2017 audit fall into three categories. For each category, one main station and one relay station were selected. The categories and sites are shown below;

- a) Two sites which have been part of a previous audit and which have been reviewed by Arqiva. Hannington and Salisbury.
- b) Two sites which have not been part of a previous audit and which have been reviewed by Arqiva. Sutton Coldfield and Leamington Spa.
- c) Two sites which have not been part of a previous audit and which have not been reviewed by Arqiva. Ridge Hill and Malvern.

Arqiva provided the following records and information in advance of the site visits.

- 4.1. **Antennas:** A full set of KEEP records for each of the sample sites. The KEEP records are compared to site observations and photographs taken from the ground.
- 4.2. **Information:** Arqiva have previously provided a glossary of terms used in the KEEP database.

Each site was visited by Jon Butler (Deputy Adjudicator) accompanied by Adrian Giblin as a representative from Arqiva. Each structure was photographed at various locations distant from the mast to aid identification and to provide an audit record. A hand bearing compass was used on the ground to confirm the orientation of the structure and to give an approximate bearing relative to the structure of any antennas.

#### 5. Audit Questions

At each transmitter site the following question was addressed;

- 5.1. Do the KEEP records from 4.1 show an antenna system at a location on the mast or tower which is reasonably consistent with site observation?

The audit question is addressed through reasonable estimation rather than precise measurement. Antennas are observed from ground level and heights are estimated relative to the structure and other antennas.

#### 6. Schedule of site visits

Each site was visited according to the schedule set out below. In addition, follow up sessions were held at Arqiva's offices at Crawley Court in Hampshire.

- 5 September 2017: Hannington and Salisbury
- 6 September 2017: Leamington Spa and Sutton Coldfield
- 7 September 2017: Malvern and Ridge Hill

## **7. Identification method**

Antennas were identified at ground level using the Arqiva KEEP schedule of height, type and orientation to aid identification. Exact measurements were not possible, but heights and orientation were considered relative to other antennas on the structure. Photographs were taken using an interchangeable lens camera with a telephoto lens. Annex 1 contains a sample of photographs. All photographs and records have been supplied to Arqiva.

Arqiva previously supplied a glossary of terms to aid antenna identification from the schedules. This is attached as Annex 2.

## **8. Summary of findings – Report versions**

The Deputy Adjudicator has initially produced this report in draft form (version 0.xx) summarising the findings and noting any discrepancies or observations regarding the accuracy of the Arqiva records compared to site observations. The draft report is shared with Arqiva who may comment upon factual accuracy prior to final issue. The final version has document reference 1.xx and includes Arqiva's response to the findings. The Adjudicator will be responsible for any actions following production of this report.



## 9. Summary of findings – Results

Tables showing results are contained in Annex 3 to this document. There were 743 antenna observations and only those where the observation was inconsistent with Arqiva’s records are contained in Annex 3. The full list with comments has been provided to Arqiva.

**9.1 Antennas:** Do the KEEP records from 4.1 show an antenna system at a location on the mast or tower which is reasonably consistent with site observation?

Arqiva provided a schedule of 792 antennas across the six sites. The schedule included 67 antennas which were either wall mounted or at 0m and not on the structure. These were excluded from the audit observations. Site observations showed an additional 18 antennas which were not recorded in the schedules. The results below relate to the sum of the antennas mounted on the structures or the schedule, 743 antennas in total. The second (smaller) structure at Sutton Coldfield is not included in the analysis.

### Of the 743 antennas in total:

**537** results were recorded as reasonably consistent with the Arqiva records

**136** results were recorded as not reasonably consistent with Arqiva records

**70** results were recorded as observations

### Of the 537 ‘reasonably consistent’ results

Antennas were observed on the structure at a height and location which was reasonably consistent with the KEEP records.

### Of the 136 ‘not reasonably consistent’ results:

**43** antennas are recorded in the schedule as installed but were not observed on the mast or structure (37 wireless and 6 broadcast)

**53** antennas were observed on the structure and are not in the schedule as installed or are missing from the schedule (30 SHF dishes plus cellular antennas and others)

**40** antennas had data in the schedule which was inconsistent with observations, as example; incorrect antenna type, bearing, height, leg (34 wireless and 6 broadcast)

### Of the 70 observations:

These were generally observations where the antenna may or may not have been on the structure and where it is described as redundant or remove.

A breakdown of the ‘not reasonably consistent’ results is shown below:

Breakdown of 'not reasonably consistent' by cause and category	Total	Wireless	Broadcast
In schedule as installed and not observed on mast or structure	43	37	6
Observed on mast or structure and not in schedule as installed or missing from schedule	53	34	1
Schedule data not reasonably consistent with observation	40	34	6
<b>TOTAL</b>	<b>136</b>	105	13

The total includes 18 antennas observed on the mast or structure and not recorded in the schedules. From the site observations it was not possible to determine whether they were Wireless or Broadcast antennas.

A breakdown of the antennas by site is shown below:

2017 KEEP data tests and site observations		Total	Hannington	Salisbury	Sutton Coldfield	Leamington Spa*	Ridge Hill*	Malvern
	Reasonable observation	537	141	73	101	37	146	39
A	Antenna not observed, recorded as installed in schedule	43	9	0	6	7	11	10
B	Antenna observed, not recorded in schedule	53	16	3	14	8	10	2
	Schedule data not reasonably consistent with observation	40	4	8	4	8	12	4
	Observation	70	5	14	18	4	20	9
C	<b>Total samples on mast or structure</b>	<b>743</b>	<b>175</b>	<b>98</b>	<b>143</b>	<b>64</b>	<b>199</b>	<b>64</b>
(A+B)/C	% of antennas either missing or present and not recorded as such in schedule	13%	14%	3%	14%	23%	11%	19%
	Not included due to wall mount or other	67	23	9	7	12	6	10

## 9.2 Comparison to previous findings:

The findings from Hannington and Salisbury in 2017 are compared to the findings from 2016 in the table below;

	KEEP data tests and site observations	2017 results			2016 results		
		Total	Hannington	Salisbury	Total	Hannington	Salisbury
	Reasonable observation	214	141	73	204	130	74
A	Antenna not observed, recorded as installed in schedule	9	9	0	14	9	5
B	Antenna observed, not recorded in schedule	19	16	3	24	20	4
	Schedule data not reasonably consistent with observation	12	4	8	5	4	1
	Observation	19	5	14	31	18	13
C	<b>Total samples on mast or structure</b>	<b>273</b>	<b>175</b>	<b>98</b>	<b>278</b>	<b>181</b>	<b>97</b>
(A+B)/C	% of antennas either missing or present and not recorded as such in schedule	10%	14%	3%	14%	16%	9%

When compared with the 2016 findings, those from 2017 show a reduction in the number of antennas either missing or present and not recorded as such in the KEEP schedule. Arqiva report that since the previous audits in 2016, there have been 61 new antenna installations across these two sites and that 12 of the antennas are currently subject to change within active projects.

Arqiva have provided further analysis in their responses contained in section 10 of this report.

## 10. Responses from Arqiva following the September 2017 audit

### 10.1. The impact of antennas which are part of on-going projects

Arqiva provided the following response on 11 December 2017.

*The overall summary of results provided by the auditor in the 2017 Keep audit has provided the following initial results:*

2017 KEEP data tests and site observations		Total	Hannington	Salisbury	Sutton Coldfield	Leamington Spa*	Ridge Hill*	Malvern
	Reasonable observation	537	141	73	101	37	146	39
A	Antenna not observed, recorded as installed in schedule	43	9	0	6	7	11	10
B	Antenna observed, not recorded in schedule	53	16	3	14	8	10	2
A + B	Total where there will be an impact on Site Apportionment		25	3	20	15	21	12
	Schedule data not reasonably consistent with observation	40	4	8	4	8	12	4
	Observation	70	5	14	18	4	20	9
C	<b>Total samples on mast or structure</b>	<b>743</b>	<b>175</b>	<b>98</b>	<b>143</b>	<b>64</b>	<b>199</b>	<b>64</b>
(A+B)/C	% of antennas either missing or present and not recorded as such in schedule	13%	14%	3%	14%	23%	11%	19%
	Not included due to wall mount or other	67	23	9	7	12	6	10

*These results include the impact of a number of projects that are underway for several customers. As detailed in Arqiva's response to the auditor, Arqiva is happy that these particular discrepancies identified are not relevant to include in the overall results.*

*When the results are updated to incorporate the removal of the on-going projects records, the overall summary of results is updated as follows:*

2017 KEEP data tests and site observations		Total	Hannington	Salisbury	Sutton Coldfield	Leamington Spa*	Ridge Hill*	Malvern
	Reasonable observation	572	152	74	102	50	150	44
A	Antenna not observed, recorded as installed in schedule	25	5	0	5	1	7	7
B	Antenna observed, not recorded in schedule	36	9	2	14	1	10	0
	Schedule data not reasonably consistent with observation	40	4	8	4	8	12	4
	Observation	70	5	14	18	4	20	9
C	<b>Total samples on mast or structure</b>	<b>743</b>	<b>175</b>	<b>98</b>	<b>143</b>	<b>64</b>	<b>199</b>	<b>64</b>
(A+B)/C	% of antennas either missing or present and not recorded as such in	8%	8%	2%	13%	3%	9%	11%

*Arqiva is continuing to review these results. In particular, at Sutton Coldfield there are some antennas that have been added after the additional site survey was carried out.*

## 10.2. Update on actions since the 2016 audits

Arqiva provided the following response on 11 December 2017.



## 10.3. Analysis of the discrepancies in the KEEP records and the impact on broadcast customer charges

Arqiva were asked to analyse the discrepancies between site observations and the antenna KEEP records to understand any impact on customer charges. On 7 December 2017 Arqiva provided analysis of how the data discrepancies impact rent and rates apportionment (pass through charges) and Network Access charges.

Arqiva's analysis shows a relatively small change in the charge passed through to each customer. Some sites show an increase and some a decrease, the overall change across all sites equates to an under charge of 2% to TV customers and an over charge of 2% to Radio customers, most at a few £ or tens of £ per customer.

Arqiva's analysis shows a relatively small change in the Network Access charges based on windloading. Some sites show an increase and some a decrease, the overall change across all sites equates to an over charge of 2% to TV customers and an over charge of 2% to Radio customers. Most TV discrepancies were a few hundred £ per customer with some sites being over and some under charged. Most Radio discrepancies were a few tens of £ per customer with some sites being over and some under charged.

Arqiva's analysis shows that the data discrepancies in KEEP result in potential minor incorrect charges to customers for both pass-through and network access charges. The analysis also shows that discrepancies are not site specific and charges may be over or under. Arqiva note that as such, correctional changes can not be implemented more widely across further sites but that they will implement corrections for the sample sites in line with the relevant customer contract. Arqiva further note that for other sites not in the audit, they will follow up with other on-going initiatives.

Arqiva's full analysis is attached to this document as Annex 4.

## 11. Arqiva's response to the audit findings

Arqiva provided the following responses in January 2018 and December 2017:

### OTA-BTS Keep Audit 2017

#### a) Arqiva's response to the audit findings

Despite positive action since the last audit, Arqiva is disappointed that this audit has picked up several data record issues and we recognise that there is still work to do to carry on improving our antenna data records. We note that the observations have a very small impact on some customer charges, both positive and negative.

There is a general split in the antenna use for regulated and non-regulated services. The regulated antennas are usually relatively large antennas at the top of the support structure. This results in these antennas incurring a large proportion of the structure's wind-loading and related charge element.

The vast majority of discrepancies which have been identified relate to non-regulated customer services which cover smaller antennas installed lower down the structure, below the broadcast antennas. These are usually for mobile network operators or other non-broadcast site share customers. The inconsistencies with the antenna records for these customers have a much smaller proportional impact on the regulated charges than those with the broadcast antennas.

Arqiva plans to work to continue to improve our data records through ongoing work as part of the actions previously identified, along with additional ones which may result from our wider data and process improvement initiatives.

#### b) Arqiva's response to the audit results

As a follow-up to the Keep Audit undertaken for the Office of the Adjudicator in 2017, Arqiva has reviewed the status of projects that apply to the antennas reviewed on the sample sites in the audit.

The status of antennas in the report provided is one of:

PLANNED  
RESERVED  
INSTALLED  
REDUNDANT  
REMOVE

Underlying the status is a workflow of how the application for use of an antenna on a structure is managed from an initial request through to build works on site and steady state use. Any removal of an antenna is also managed in a similar workflow approach.

The illustrations below show the relationship of the Keep antenna status in the different workflows.

For the antennas checked as part of the audit, it has been possible to confirm whether they are in a Steady State service or whether they are under-going change as part of an on-going project.

Arqiva has recognised that a significant number of antenna status records may not reflect the as observed state of an antenna while it is part of a project.

There has been a significant amount of change in non-broadcast antennas on Arqiva sites since the last audit in 2016.

For the sample sites the number of new antennas since 2016 are:



This illustrates the number of changes being undertaken recently and this correlates with the number of projects on-going at the time of the audit.

The typical duration of a project, based on recent antenna changes, from initial application to project completion into a Steady State is over 30 days.

Arqiva believes that it is correct to review the inclusion of on-going projects in the audit results.

Further explanation is provided below:

There are two groups of discrepancies from the audit that are categorised as On-going Project related that can be explained as part of the expected project workflow.

**1) On-going Project Antennas not observed that are recorded as installed on the schedule (18 off)**

These are antennas that have previously been in a steady state installation and are recorded as Installed. The antenna is only removed from Keep when the Project Complete milestone on the removal project has been claimed. This removal may be linked to another antenna installation as the customer relocates the service from the previous arrangement to the new antennas. The decommissioning of the old antennas, commissioning of the new antennas and the conclusion of commercial formalities can take some time, resulting in the antenna having an Installed status until the project is completed, although it has been removed from site.

**2) On-Going Project Antennas observed that are not recorded on the schedule (17 off)**

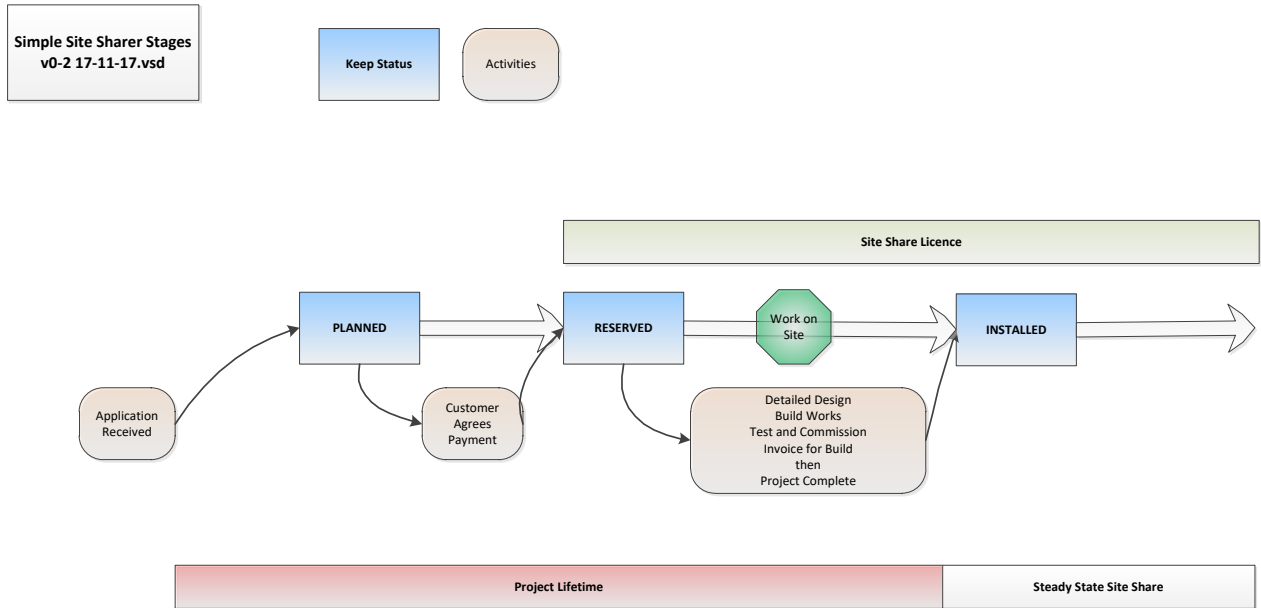
These are antennas that have been installed, but are only recorded as Reserved. The status of the antenna is only updated to Installed when the project is complete. To claim the Project Complete milestone all handover information and new billing must be in place and agreed by the relevant customer. This can be some time after the site works to install an antenna take place due to commissioning, optimisation activities by the customer and conclusion of commercial formalities. This results in the antenna having a Reserved status on Keep although it has been installed on site.

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Arqiva has proposed that the analysis of the impact on broadcast customers is carried out without the discrepancies identified as part of on-going projects included. This is in line with the allocation of Site Apportionment to the projects during their project stages and has been reflected in the analysis of the impact on charges.

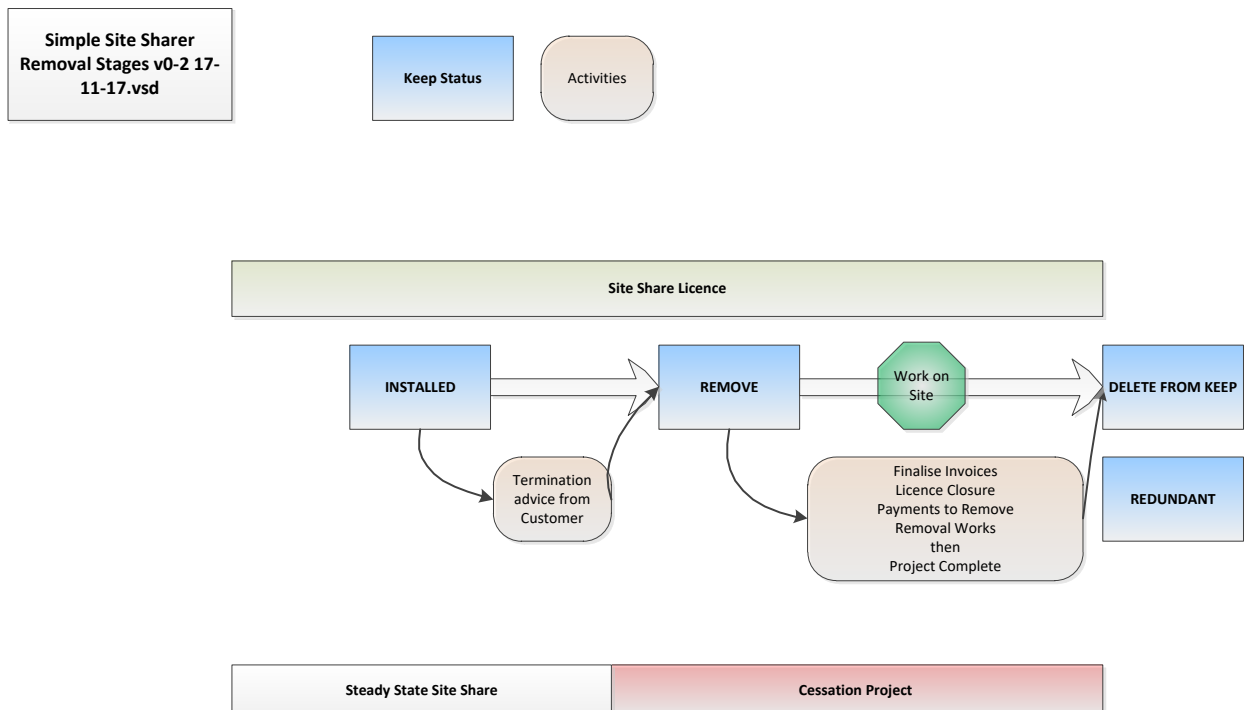
**Figure 1: Simple Site Sharer Workflow:**

The figure below illustrates the status on Keep and when it is updated relating to the other activities required as part of the workflow to add a new antenna to a structure.



**Figure 2: Simple Site Sharer Antenna Removal Workflow:**

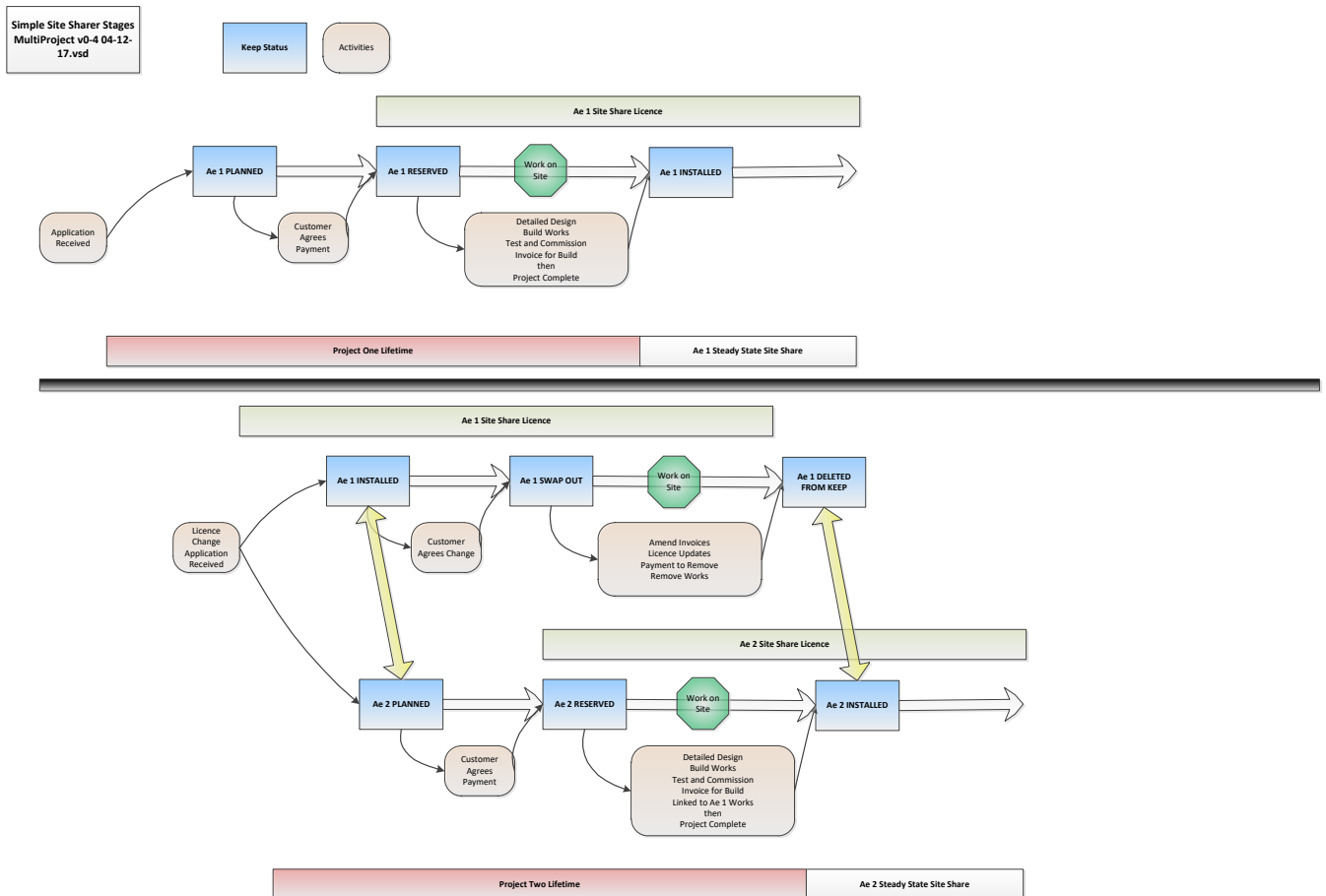
The figure below illustrates the status on Keep and when it is updated relating to the other activities required as part of the workflow to remove an antenna from a structure.



**Figure 3: Simple Site Sharer Antenna Removal Workflow:**



The figure below illustrates the status on Keep and when it is updated relating to the other activities required as part of the workflow for an initial antenna installation (Antenna 1) and then the replacement of this antenna by a substituted antenna installation, (Antenna 2) to replace the initial installation with a subsequent arrangement. Typically, this can be the case for the migration of a Mobile Network Operator service from one generation of equipment to another, (2G or 3G to combined 2G/3G/4G).



**Annex 1: Sample of site photographs**

**Clockwise from the left; Sutton Coldfield, Leamington Spa, Hannington detail, Ridge Hill, Salisbury and Malvern.**



## Annex 2: Glossary of related terms used in the Arqiva schedule

<b>4L Cardioid</b>	Four Lambda Cardioid where lambda relates to the wavelength of the services being transmitted.
<b>8L Cardioid</b>	Eight Lambda Cardioid
<b>16L Cardioid</b>	Sixteen Lambda Cardioid
<b>DR</b>	Digital Radio
<b>GPRS</b>	General Packet Radio Service
<b>MHA</b>	Mast Head Amplifier
<b>ODU</b>	Outdoor Unit
<b>PCN</b>	Personal Communications Network
<b>RCU</b>	Remote Control Unit
<b>TETRA</b>	Terrestrial Trunked Radio

### Latest Antenna Status Explanation

<b>Installed</b>	Antenna in use – included in Site Apportionment
<b>Planned</b>	Antenna expected to be installed – not included in Site Apportionment
<b>Redundant</b>	Antenna not in use – not included in Site Apportionment
<b>Reserved</b>	Antenna expected to be installed – included in Site Apportionment
<b>Remove</b>	Used to highlight antennas for removal and may be used with an Installed or a Redundant antenna.

### Feeders

A feeder is usually associated with an antenna.

Where a broadcast antenna is constructed from a number of separate dipoles, panels or other discrete elements, the group of antennas that comprise the whole antenna system will be captured within Keep as a number of elements.

Each antenna entry may have multiple tiers in the Keep antenna entry.

A five-around antenna system of eight tiers will have five antenna entries, (usually one per bearing), and eight panels in the individual entry on that bearing stacked above each other.

For such an antenna system, there will be only one or two feeders. These are associated with the antenna entry for one bearing and no feeders are associated with the remaining antennas in the system on other bearings.

An example of this is:

Mendip S1 DTT antenna, (DT\_MEN\_01), - 10 tiers of panels on 5 faces

Antenna ID	Antenna Type	Antenna Quantity	Feeder Quantity
258319	UHF DTT Panel	10	2
258321	UHF DTT Panel	10	0
258322	UHF DTT Panel	10	0
258326	UHF DTT Panel	10	0
258327	UHF DTT Panel	10	0

### Antenna Leg Designation

Each structure will have each leg of the structure designated with a letter starting from A. Any face of the structure may be defined as being between two adjacent legs such as AB and CA.

There are additional designations used, either where the antenna is at the top of the structure or for structures that do not have legs such as steel or concrete cylinders.

The following description is used in Keep:

Antenna Leg denotes the mounting position of the antenna on the structure. Codes referencing the structure legs are used for towers (i.e. A, B and C for triangular towers - A, B, C and D for square towers - leg A is always the first leg east of True North).

Examples:

- A (antenna located on leg A),
- AB (antenna located at the centre of face AB),
- ABR (antenna located along the right half of face AB),
- ABL (antenna located along the left half of face AB).
- A number of other codes identify alternative mounting locations:
- AXI (antenna on top of the tower located centrally),
- TOP (antenna on top of the tower offset from centre),
- WAL (antenna located on a wall or building),
- P (antenna located on a pole or other cylindrical structure),
- ALL (antenna located on a triangular/delta frame),
- TOR (antenna located on a circular/toroid frame) and
- PLT (platform signifier).

An antenna may have a bearing on which it is pointed, but this may not apply to some antennas such as omni-directional antennas. These antennas may be given a bearing of 0 degrees or 360 degrees.

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**Annex 3: Antenna observations classified as not reasonable**

Columns 12 to 14 show the results of the antenna observations. Columns 1 to 11 are extracted from the KEEP database except where an antenna was observed but not recorded in the KEEP database, in which case the record has been added to this table.



## Annex 4: Arqiva's analysis of the discrepancies in the KEEP records and the impact on broadcast customer charges

### Office of the Adjudicator - Broadcast Transmission Services

#### Keep Audit – Impact on Pass-Through Charges

Following the Keep audit for the Adjudicator at a sample of six sites, Arqiva has carried out analysis of the impact of the discrepancies that were identified in the audit. The customer use of antennas on structures is used to apportion certain charges, including pass-through charges in accordance with customer contracts. These pass-through charges are for the rent and rates related to the use of the site.

Keep is used to record the data associated with antennas on Arqiva's structures and is then used to calculate relative wind loading in order to apportion the correct charge to each customer. Should Keep data be inaccurate, then the charges to each customer could also be inaccurate.

The analysis from the two six site samples has identified only small potential changes of the pass-through charges. Details are provided in the analysis spreadsheet.

In summary for the services on the sample of six sites:



When the on-going projects are not included the impact is:



The changes lead to both small increases and small decreases to charges per site per service.

The analysis of the discrepancies is site specific and does not result in common changes that can be implemented more widely across further sites. Furthermore, in the normal course of business the number of sharers increases and decreases over time as well as the underlying rent and rates at each site. This results in annual variations to pass-through charges in the order of  $\approx$ %, which we note is a greater order of magnitude than the variations reported here.

As a result, Arqiva will implement the corrections for the specific sites already identified and will also follow up other on-going initiatives that will review and update the Keep data.

For the services on the sample sites the changes to charges for the customers are being implemented under the terms of the relevant customer contract.

[Confidential: .]

## Office of the Adjudicator - Broadcast Transmission Services

### Keep Audit – Impact on Network Access (Non-Pass-Through) Charges

Following the Keep audit for the Adjudicator at a sample of six sites, Arqiva has carried out analysis of the impact of the discrepancies that were identified in the audit. The customer use of antennas on structures is used to apportion certain elements of the Network Access contribution to certain customer charges in accordance with customer contracts. The customer use of antennas is not part of the Managed Transmission Service charge.

Keep is used to record the data associated with antennas on Arqiva's structures and is then used to calculate relative wind loading in order to apportion the correct charge to each customer. Should Keep data be inaccurate, then the charges to each customer could also be inaccurate.

The analysis from the six site sample has identified only small potential changes of the Network Access charges. Details are provided in the analysis spreadsheet.

In summary for the services on the sample of six sites:

✂

When the on-going projects are not included the impact is:

✂

Note: The Network Access charges shown are for the 6 sites sampled

The changes lead to both small increases and small decreases to charges per site per service, (up to +/- c£✂ pa per TV Multiplex and up to +/- c£✂pa per Radio service).

The analysis of the discrepancies is site specific and does not result in common changes that can be implemented more widely across further sites. Furthermore, in the normal course of business the number of sharers increases and decreases over time.

As a result, Arqiva will implement the corrections for the specific sites already identified and will also follow up other on-going initiatives that will review and update the Keep data.

For the services on the sample sites the changes to charges for the customers are being implemented under the terms of the relevant customer contract.

[Confidential: ✂.]