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VERINT CONSULTING

Final Report on Research into the Accuracy of Answer Machine Detection Technology

28 July 2009

FOR AND ON BEHALF OF OFCOM

CONTENTS

1 Introduction

This report has been commissioned by [redacted] Ofcom and delivered by a team working on behalf of Verint Consulting ("VC").

In both their Statement of Policy on the Persistent Misuse of an Electronic Communications Network or Service (Mar 2006) ("The Original Statement") and the Revised Statement (Sep 2008) Ofcom have addressed the issue of Silent and Abandoned Calls made by outbound contact centre operations. In effect they have attempted to eliminate the former and reduce the latter to no more than 3% of Live Calls.

Answer Machine Detection ("AMD") technology is used to attempt to identify and disconnect calls that have been (or will be) answered by Answer Machines ("AMs"). This technology has been popular because it reduces the time agents spend listening to and disconnecting AM calls and allows them to spend more time talking to Consumers. This effect and arguments around it are discussed in section 8 of our report.

Before the Revised Statement it had become apparent that AMD technology was creating a number of Silent Calls through the existence of False Positives ("FPs") – the situation where the technology wrongly assesses the answering party to be an AM and disconnects. This creates at best an Abandoned Call and at worst (and typically) a Silent Call. The Revised Statement required that a reasoned estimate of FPs be included in the calculation of Abandoned Call rates.

The level of interest and concern that this amendment to the Guidelines has caused has led to Ofcom wanting to deepen their knowledge on the subject and they have commissioned this report to that end.

Specifically they have asked VC to undertake research in the following 4 areas:

1. Draw conclusions on the reliability of AMD, including identifying the factors which may influence the occurrence of AMD False Positives, and if practical, providing estimates of the reliability of AMD;

2. Examine the scenarios which might affect the likelihood of a call centre utilising AMD being able to comply with the Abandoned Call rate as set out in Ofcom's Revised Persistent Misuse Statement;

3. Identify types and sources of information available to contact centres which may be used by them to make a reasonable estimate of AMD False Positives; and

4. Comment on the likely efficiencies or productivity gains that can be attributed to the use of AMD in call centres.

Our report follows this requirement closely. As agreed, we have been able to include 7 test sites in our analysis, the results for which are included in our report and have informed our analysis.

The research work was undertaken in April-June 2009.

A matter of note is that VC have been surprised by the (in our experience) unprecedented help and commitment provided by many of the organisations to whom we have spoken. Research projects of this nature generally come up against a significant degree of ambivalence and often antipathy. Such a reaction has been limited with respect to this project. We believe this represents a real desire within the industry to have the matter dealt with and for clarity to be provided.

The subject matter considered in this report is of a complex and technical nature. We have attempted to simplify and make consistent the vocabulary of the report by using a number of acronyms and industry terms. These are detailed in Appendix 1 – Glossary and we would urge that you refer here wherever necessary.

2 Executive Summary

2.1 Overview

This project has highlighted the level of interest across the industry in the use of AMD in general and False Positives ("FPs") in particular. It is clear there are strongly held beliefs on both sides of the argument, augmented by intense commercial pressure. However there is general consensus that there exists a real issue with FPs that the Revised Guidelines were correct in highlighting, besides which runs a hope and expectation that Ofcom will provide more guidance on the matter.

We believe the complexity of the FP issue, the difficulty of quantifying and uncertainty of managing it down had encouraged the industry largely to ignore the problem until last September. The Revised Guidelines have thus thrown a stone into previously artificially calm waters and hence the confusion now.

During the project we have spoken to numerous manufacturers, operators and industry experts who, on the whole, have been extremely open with us. We have tried to incorporate as many of their views as possible into our report.

2.2 Factors Effecting False Positive Rates and Estimates of reliability

Effecting Factors

False Positive Rates ("FPR") are influenced by a number of factors as summarised in the table below and detailed in section 5 of our report. Given the lack of available data it is hard to quantify the effect of each of these factors and the "Estimated Effects" column should be viewed very much as an estimate only. Overtime increased test data should illuminate this issue and allow more certain conclusions to be drawn (see section 2.4 below).

Factor	Summary	Estimated Effect
1 Technical		
1.1 Dialler Manufacturer	Type of dialler used in conjunction with AMD kit	High This defines the platform and functionality available
1.2 AMD equipment used	Type of AMD equipment selected	High This defines how (and how well) AMD can be used. (although some obvious overlap with 1.1 above)
1.3 Sensitivity	Degree of aggression with which AMD is set to classify Answer Machine ("AM") pick ups	High This defines the confidence level at which AMD equipment can assume AM.

Factor	Summary	Estimated Effect
1.4 Analysis Time	The time allowed to analyse salutations	Low Assuming 2 second rule is adhered to a centre has no influence on this factor (i.e. only 2 seconds allowed for analysis). High for centres non compliant to 2 second rule (NB overlap with 1.3 above)
2.Telephone Type Called	Landline / Mobile / VOIP (e.g.Skype)	Medium Effect has been described to us as "significant" – but inconsistency as to which way it influences FP Rates and to what extent
3. Consumer Location	Where the consumer is likely to be at the time of the call and what is likely to be in the background	Medium A significant factor in the success of AMD but hard to quantify likely effect or predict variances. Likely to be relatively consistent across operations and campaigns.
3. AM Type Used	Analogue, digital home, digital network	Medium Significant for some operations and not others. Newer AMD solutions benefit from high network activity. Analogue AMs increasingly rare.
4. Demographics	Classification of Consumers called.	Medium Most interviewees raised it as an issue but most agreed "not the most important factor". However likely to be a true variance across campaigns.
5. Calling Window	When the calls are made.	Low Effect described as "noticeable but not significant" by some and important by others. Likely to balance out across campaigns

Estimates of Reliability

Our research suggests that only limited testing has been undertaken by Operators and manufacturers to date. However we are aware of robust live testing programmes currently being undertaken and hope that the findings will be made public.

Tests that have been undertaken have led to some Operators switching off AMD and others feeling able to rely on a site wide percentage FPR.

Some manufacturers have quoted FPRs for their equipment and others have advised clients to switch off the equipment as they cannot guarantee compliance. Our findings are detailed in section 5.2.3 and 5.2.4.

We have been able to test 7 sites and our findings are summarised in the table below:

Factor	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6 A	Site 6 B	Site 6 C	Site 7
Answer Machine rate (AMD off)	27.6%	n/a	9.4%%	31.2%	19.8%	45.0%	38.2%	31.4%	24.68%
Answer Machine rate (AMD on)	29.0%	52.0%	13.2%	14.4%	28.8%	44.7%	38.6%	32.2	25.7%
AMD System Answering Machines (%)	10.3%	52%	8.4%	13.2%	19.9%	36.4%	34.1%	29.9%	10.5%
False Positive Rate with AMD (% of system identified AMs)	13.5%	0.58%	44.6%	20%	45%	0%	1.18%	2.79%	9.7%
Compliant abandonment rate (no AMD FP factored in)	1.56%	0.63%	1%	1.1%	4.14%	3.1%	0%	1.58%	2.34%
Total Abandonment Call Rate	4.75%	2.3%	10.6%	9.28%	33.2%	3.1%	1.19%	3.78%	3.6%
AMD increase in Decision Maker Contacts / hr	9%	-	17%	-	-	13%	-	12%	-
AMD increase in sales / hr	Nil	n/a	11%	3%	n/a	-	-	-	-

See below for table narrative and Appendix 2 for calculations and further explanation

Note
Our testing was undertaken to provide a snapshot of what is going on in the market and to validate some test methodologies. It cannot be used as anything more than a guideline as to AMD rates in the market place and is presented as indicative only.

Summary Table Narrative
This brief narrative illustrates how to interpret the table above, using site one as an example.

Test site one experienced an answer machine rate of 27.6% when they were not using their answer machine detection technology. When they turned this on the apparent level of answer machines detected rose to 29.0%. The equipment did not identify all of these answer machines, it detected10.3% the remaining 18.7% were calls put through to agents which were actually answer machines (i.e. false negatives). Before any allowance for AMD false positive calls was made, this operation was operating with a 1.56% compliant abandonment rate. Our calculations showed that of all the system identified answer machines detected it is likely that 13.5% of these would be false positives (i.e. a live person answered the phone but the equipment wrongly identified them as an answer machine and terminated the call). The calculation for the total abandoned calls, which includes the 'compliant abandoned calls' and the estimate for false positive calls showed that the operation was operating at a total abandonment level of 4.75% and thus exceeding the 3% maximum limit. With the AMD functionality turned on this operation spoke to 9% more decision makers per hour.

2.3 Compliance

In assessing whether operations running AMD can be compliant to the Abandon Rate requirement in the Revised Guidelines (4.16.1) ("The Three Percent Rule") requires amendment of the basic FP rate. In short to become the correct percentage, The FPR has to be adjusted for 2 factors:

- To reflect and be reduced by the ratio of AM calls sent to agents (the "AMD Rate")
- To be expressed as a percentage of the same denominator as the Abandoned Rate (calls passed to live Consumers whether abandoned or not)

We have outlined how this can be achieved in Section 6.

Changing the following factors will increase the FPR that is allowable:

- Increasing the live call rate; or
- Lowering the AM Rate; or
- Lowering the AMD Rate.

At high levels of AM rate (40% plus) only lower FPRs will be acceptable – to such an extent that unless AMD rates are very low, using the technology becomes impossible unless exceptionally low FPRs are delivered.

Similarly at low levels of AMD rate (where more calls are pushed to live agents) higher FPRs can be tolerated, but in this scenario the value of the technology is compromised by being run inefficiently.

We have set out numerous scenarios in section 6 and Appendix 2 to illustrate the interconnectedness of these factors. In summary we believe that it will be hard for most Operators to run compliant AMD at a level of AMD Rate that delivers significant operational savings to them. However if equipment can run consistently at the top end of FPRs that we have been quoted (and in one instance where we have tested) some Operators should be running compliantly.

Out of scope of the report is a detailed calculation of how operations might calculate this percentage from available operational data and the creation of a detailed arithmetical formula based on such data. We are aware that this is being worked on by other agencies and believe it will be made available to Ofcom.[1] This calculation is vital if operators are to be able to monitor compliance including FPR.

[1] The pertinent issue is that some of the variables assumed in our calculation, and acceptable for illustrative purposes and scenario modelling, cannot be derived from data available to an operation e.g. actual Live Ratio or AM ratio.

2.4 Testing

Testing Methodology

We have reviewed testing procedures undertaken by operators to date, considered the views of manufacturers and considered all theoretically available test methods. These are detailed in section 5.2 and 7. In summary we believe the most appropriate and practical test methodologies are as follows:

1. Trunkside recording testing
2. Side by Side testing (split testing)
3. Agent Validation testing
4. Live call scenario testing
5. Laboratory calls scenario testing.

Testing Regime

It is clear that there is a degree of confusion in the industry as to what is expected of them. If Ofcom are to provide further clarity they might want to consider providing guidance in the following areas:

Testing methodology	As discussed above Ofcom might consider including a more definitive and detailed list of suitable testing methodologies and possibly rank them by preference.
Testing Accuracy	What confidence levels are acceptable.
Testing Proactivity	Defining how and when Ofcom should be notified of use of equipment, testing and testing results
Testing Regularity	when should testing be undertaken and when can wider benchmarks be accepted**.**
Testing Objectivity	Extent of requirement for a third party to undertake/validate test results
FP rate Conversion	Guidance on converting FP rate to Contribution to Abandon rate (“FPC”)

Testing Outcome

At present we do not believe there is evidence to substantiate the use of a more general FPR than that which has been tested on a campaign basis (and quite possibly within a campaign as factors change). However we strongly suspect that over time and as empirical, live, test evidence is collated, a trend could be established over a wider group of activity (e.g. by type of campaign using

the same AMD equipment at the same settings) allowing testing to be reduced. It may well be the case that this is best led by the manufacturers of the equipment if objectivity can be assured.

2.5 Effect on productivity

Contact centre productivity can be measured in terms of operational efficiency and business performance. The former considers agent productivity, the latter what the agent actually delivers (sales collections etc). Generally there is a link between the two: the more productive an agent the more they will sell/collect, but there is a growing view in the sales sector that AMD technology interferes with sales business performance even as it increases productivity.

We have considered both factors:

Operational Performance

Given a high AMD Rate (i.e. AMD equipment is picking most AMs and not passing them to agents as False Negatives "FNs")), it is generally accepted that AMD technology delivers the following optimal operational savings. As AMD Rate decreases the benefit will decrease pro rata.

	Answer Machine Rate			
	20%	30%	40%	50%
Live Talk Time AMD On (1)	75%	75%	74%	73%
Live Talk Time AMD Off	73%	71%	68%	60%
Variance (%age)	2%	4%	6%	13%
Variance (Minutes)	1 min	2min	4min	8min

To any contact centre this is a significant operational benefit all other things being equal.

Business performance

A number of sales operations (and manufacturers) claim that the use of AMD is detrimental to sales rates. The argument is based on the pause at the start of the conversation either: upsetting the agent's sales pitch, putting the Consumer on guard, or allowing the Consumer to hang up. We are convinced by the argument that some sales Operators have seen an increase in sales rates when they have switched off AMD. However most operators still claim that AMD aids their sales performance.

On the other hand all collections businesses that we interviewed believed that switching AMD off would negatively impact their business to a greater or lesser extent (or where AMD was already switched off, already had had a negative impact). Many claimed significant detriment, upto a 33% increase in costbase.

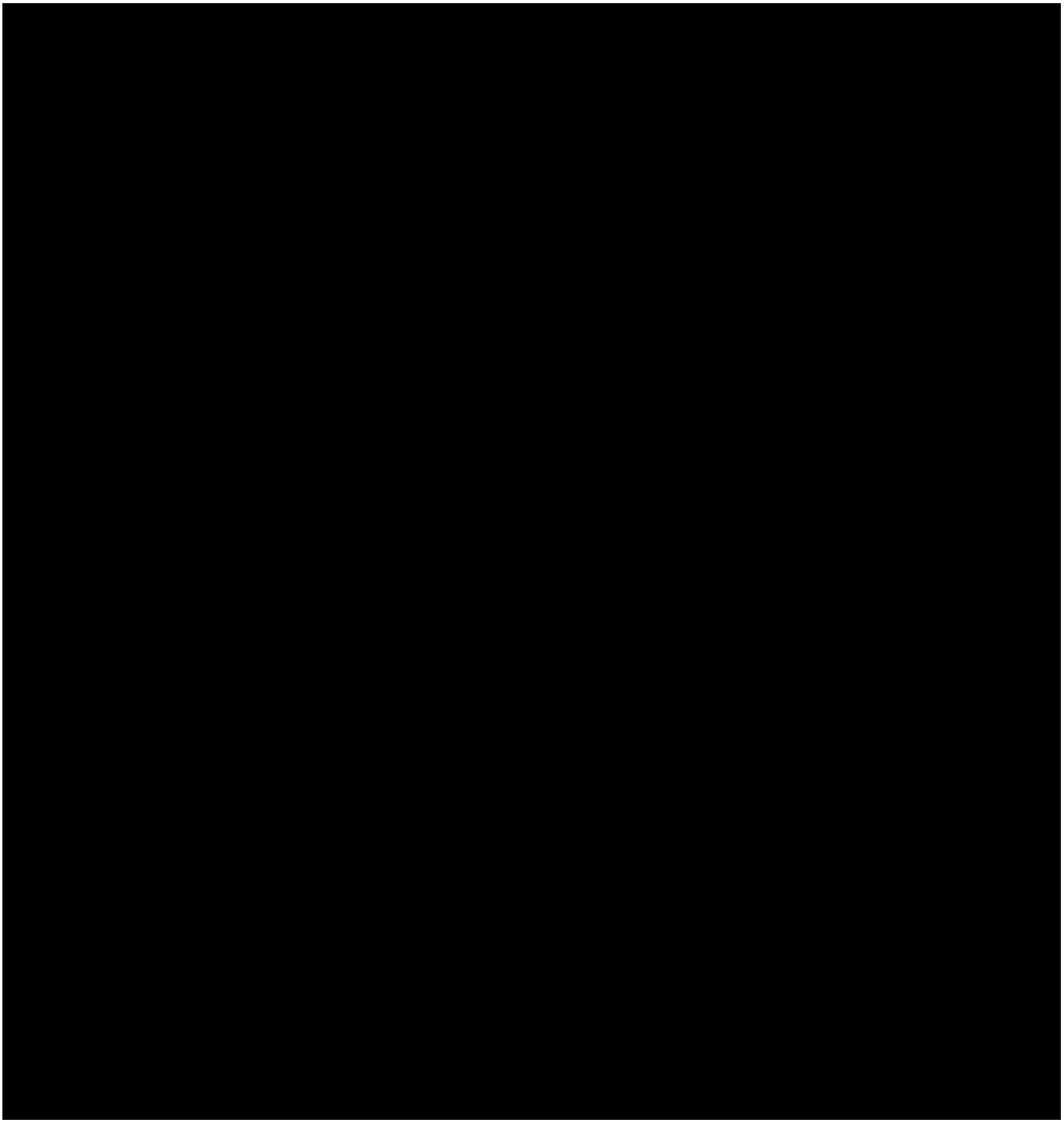
2.6 Conclusion

Our research has shown that there is a high degree of uncertainty surrounding the use of AMD – both in terms of how to quantify the levels of FPs, how to turn this into a measure of Abandon Rate and what is expected of organisations in terms of monitoring. This report provides clarity around these issues.

AMD technology provides significant operational benefits (and arguably drawbacks as well) and there remains a strong commercial imperative to protect those benefits.

We believe that a significant number of Operators are using AMD non-compliantly to The 3 Percent Rule and indeed cannot be compliant given the limitations of their solutions. At the same time we believe some Operators are compliant to the 3 Percent Rule and will continue to be so.

3 Methodology



4 Background

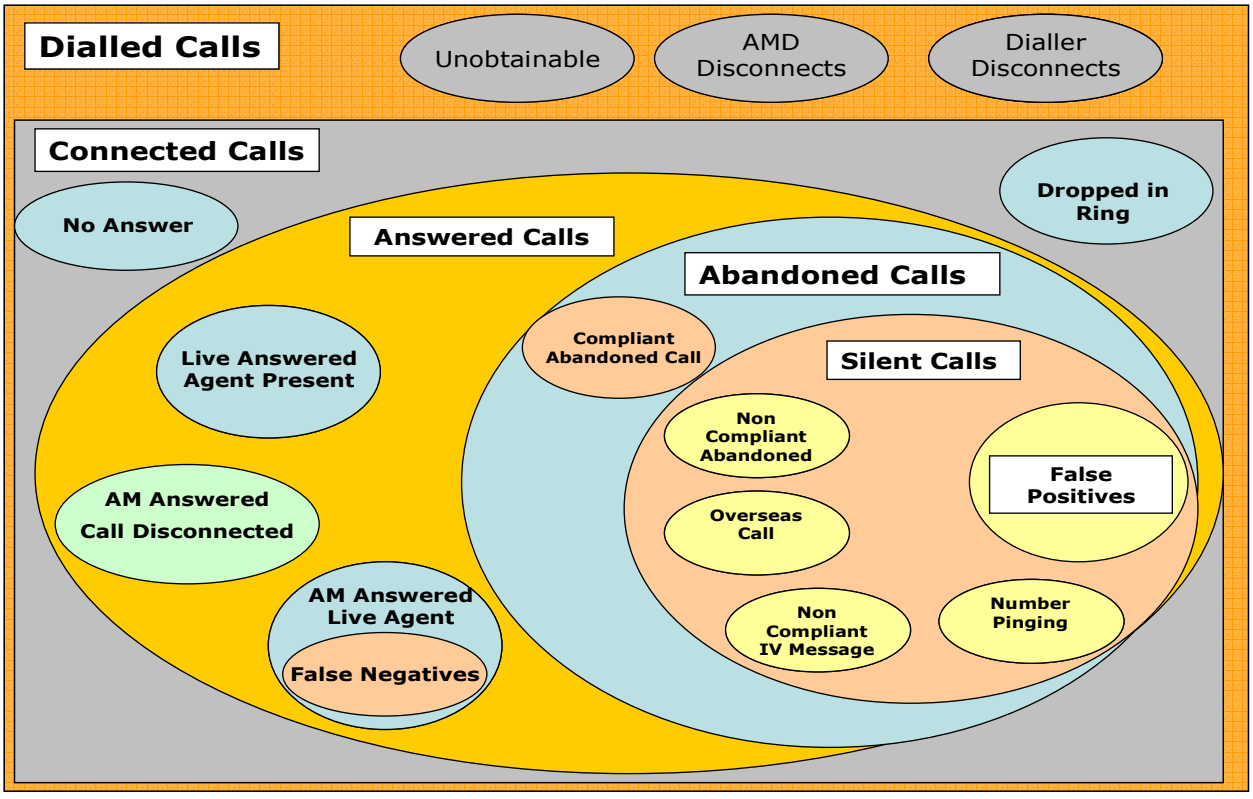
4.1 Call Definitions

During this research project we have been made aware of some confusion about call type definitions. This section of our report intends to provide clarity and outlines our view of the call types in existence.

4.1.1 Call Types

AMD equipment can only be used in tandem with a dialler and is only ever used, in our experience, when the predictive element of a dialler is turned on. We have limited our analysis to this scenario and have excluded manual dialling and power dialling scenarios[1]. We believe these will not rely on AMD technology and therefore will not generate FPs. Diagram 1 below summarises the populations of calls that are considered in this report.

Diagram1 – Call Types



[1] See section 5.1 for brief explanation of dialler technology. It is out of the scope of this report to provide a detailed analysis of diallers.

4.1.2 Detailed Call Definitions

The table below sets out our understanding of call types in more detail. The effects of variations in the volumes of each call type are considered in section 6 below.

Table 2 – Call Type Definitions

Call Type	Definition	Potential Nuisance
Dialled Calls	- Calls dialled by the system at a volume set by the dialler equipment to predefined levels of productivity and risk of overdialling. (Note: overdialling is where calls are placed and no agent is available leading to Abandoned Calls).	N/A - See Sub Groups
- Unobtainable	- Calls that cannot be connected either due to reasons such as a fault on the network, the number having been disconnected or an invalid number on the database.	No
- AMD Disconnects	- It is claimed new AMD technology can detect likely AM calls during the network connection period pre ringing. (see section 5 below)	No
- Dialler Disconnects	- Diallers may disconnect calls during connection if it calculates less agents than expected will be available	No
Connected Calls	- Sub group of dialled calls – all calls that are connected and ring/go to immediate AM at the other end	N/A - See Sub Groups
- No Answer	- Call rings out as no one answers calls. Dialler will disconnect anyway after a certain period of time (see Dropped in Ringing definition below).	Potential if persistent. Out of scope of this report
- Dropped In Ring	- Calls that are disconnected from the contact centre during ringing due to technical fault/lack of available agents or estimate that there will be no answer. - Post 15 seconds - Allowed by Guidelines (4.16.3) - Pre 15 seconds - Breach of Guidelines	Potential if persistent. Out of scope of this report
Answered Calls	- Sub group of Connected Calls – all calls answered at the other end	N/A - See Sub Groups
- Agent Present	- The perfect call – consumer answers and agent is present to make call	No
- AM Answered Live agent	- Calls answered by AM and agent present. Message left or agent disconnects.	No
- False Negatives	- Sub set of AM answered calls. AMD equipment wrongly calculates that consumer is live and passes call to agent. Agent identifies AM and either disconnects or leaves message	No

Call Type	Definition	Potential Nuisance
- AM answered call Disconnected	- Calls that are answered by AM and automatically disconnected. - If AMD is on this category includes Correct Positives as calculated by AMD equipment. - It also includes Abandoned Calls that happen to be answered by AM – these may have a message if compliant operation - NB - Not included in calculation of Abandoned Calls for 3 percent rule.	No
Abandoned Calls	- Sub group of Answered Calls – calls live answered at the other end but no agent present.	N/A - See Sub Groups
- Compliant Abandoned	- Call Answered live by Consumer with no agent present. Message played within 2 seconds of pickup.	Mitigated nuisance per guidelines
Silent Calls	- Sub Group of Abandoned Calls – calls answered live by consumer with no message or means of identification	N/A - See Sub Groups
- Non compliant Abandoned	- Calls that are abandoned as above without mitigating message.	Yes, but out of scope of this report
- Overseas Abandoned	- Call made from overseas by non UK companies and not adhering to Ofcom guidelines.	Yes - but out of scope of Ofcom
- Non Compliant IV Message	- Electronic message service calls that have failed.	Yes, but out of scope of this report
- Number Pinging	- Calls made to identify whether consumer is present /test line – no chance of answering	Yes, but out of scope of this report
False Positives	- AMD falsely calculates presence of AM post answer and disconnects. - Message unlikely to be left as system believes they are AM answered calls.	Yes

There is also an Abandoned Call where the customer answers, hears silence for a second or so, and hangs up. This is a call terminated by the consumer. If this hang up occurs within the 2 second limit for messaging on an Abandoned Call we are unclear if this is defined as an Abandoned Call or a Silent Call or neither.

Some key findings to be drawn from this analysis are:

- **False Positives are currently almost certain to be Silent Calls.**
  - The only way to eliminate this would be to have a message played on each identified AM call (correct and false) within 2 seconds of pick up. If the AMD equipment is working well this would result in a significant number of messages played to real AMs as well as to the FP live consumer.
  - Furthermore it is likely that the record phase of the consumer's AM would only pick up part of this message and further it is likely that multiple messages might be left as the number is re-called during the course of a campaign to try and connect to the Consumer. The frequency of these redials depends upon the redial rate set for the campaign.
  - We believe this process would cause considerable nuisance in its own right and as far as we are aware is not being utilised.
  - This matter is further discussed in section 6 below.

- **Compounding effect of False Positives**.
  - As defined above FP's are 'unknown' by the call centre. They therefore don't fall into the 72 hour rule for call backs. And will often be re-called very soon after first attempt.
  - Operators generally apply some degree of logic and may call back in, say, 2-4 hours or even not until the next day. These redial rules are defined by the operations and can vary by campaign.
  - If a FP occurred in the first instance it is likely to occur again. Therefore even if it is only a few campaign 'subjects' that cause FP's, they are likely to be wrongly identified each time and may then report having a string of multiple Silent Calls in close succession.

- **Calls that are answered by AMs but do not have an agent present** ("AM answered call disconnected" above), do not fit neatly into any definition. Per the definitions in the Guidelines they are not Abandoned Calls (as they are not "in circumstances where the call is answered by a live individual." (Revised Guidelines Clause 4.8) and neither are they Live Answered. Per recent Ofcom clarification they are not included in the calculation for the 3 Percent Rule.

4.2 Guideline Definitions

There has been some degree of confusion between the Original Guidelines and the Revised Guidelines.

Section 6.11 of the original Guidelines states that the term "*"Silent Call" is a generic description for all those types of calls where the person called hears nothing on answering the phone and has no means of establishing whether any one is at the other end. A specific type of Silent Call is the "Abandoned Call", where a connection is established but terminated by its originator, either on answer or before the called person has had time to answer* ".

The revised Guidelines state (section 4.8/9) "*An Abandoned Call is where a connection is established but terminated by its originator in circumstances where the call is answered by a live individual……..The term 'Silent Call' is a description for all those types of Abandoned Calls where the person called hears nothing on answering the phone and has no means of establishing whether anyone is at the other end."*

We have followed the definitions of the Revised Guidelines and we believe they more accurately describe the reality. It is out of scope of this report but we believe worth mentioning that discounted from the Silent and Abandoned Calls definitions are calls that are abandoned pre answer. These calls have in part been addressed by the 15 Second Rule, but non compliant, pre-15-second dropped calls remain undefined as neither Abandoned nor Silent Calls. These calls are likely to create nuisance.

4.3 Benefit of AMD Equipment

AMD equipment has been attractive to outbound campaigns because it aims to increase the productivity of agents. Generally it is the aim of outbound campaigns to speak to live Consumers rather than leave a message on an answer machine.

Typically if an agent handles an AM answered call they will listen to the first part of the message to verify it is an AM and then disconnect. Having agents handle calls that are answered by an AM is therefore wasted time for that agent and reduces the operational productivity of the operation as a whole. More agents will be required to deliver the same number of live contacts.

AMD equipment delivers increased productivity by eliminating AM calls from the agent queues and saves the agent the time of verifying and disconnecting. This subject, and counter arguments to it, is covered in more detail in section 8 below.

5 Draw conclusions on the reliability of AMD, including identifying the factors which may influence the occurrence of AMD False Positives, and if practical, providing estimates of the reliability of AMD

5.1 Factors that influence the Occurrence of AMD False Positives

This section looks at the factors that influence FP rates at a given moment in time. It does not consider tactics or strategies that operators could employ to manage AMD rates over a period of time; this is considered in section 6 of the report.

5.1.1 Technical Factors

5.1.1.1 Overview

Before considering the reliability of AMD equipment it is important to gain an overview of how the technology works. Our report is not intended to provide a detailed technical specification (and indeed given the variety of solutions on the market this would not be possible). This section should be seen as a summary only. If detailed information is required we suggest approaches be made to the manufacturers individually.

5.1.1.2 Diallers

AMD equipment works in conjunction with Diallers. Diallers are equipment that attempt to remove unproductive time from outbound agents. To explain this we must first consider he stages in making an outbound call. They are as follows:

- Select the Consumer record to be called and provide the relevant information,
- Validate that the Consumer can be called,
- Dial the number,
- Wait for the call to be answered,
- Note calls that are not connected and decide follow up actions,
- Talk to the Consumer,
- After call work.

All but the last 2 elements are generally considered “non productive” in terms of agent time and the more that the action can be automated the better. Diallers provide this automation.

In increasing levels of complexity the dialling options available are:

Preview Dialling – call records are selected and relevant information presented to the agent when requested. The agent then authorises the call to be placed. This saves the agent the time of finding the record. Typically 35-45% talk time can be derived.

Power/Progressive Dialling – calls are automatically dialled when an agent becomes free. This saves the agent the time of finding a record and dialling the number, but not the time of waiting for an answer/result. Typically 45-55% talk time can be derived.

Predictive Dialling – attempts to provide answered calls as and when agents become free. This is achieved by utilising complex algorithms that estimate when agents will become available and matches agents to answered calls. This eliminates all pre ring activity and also some (and in a perfect scenario, all) of the time of waiting for an answer/result. It is this functionality that we are considering in this report. Typically 75-85% talk time can be derived.

A variety of technology platforms are used to deliver predictive dialling based on the use of algorithms described above. It is not within the scope of this report to describe these solutions as the complexity of the subject would require a long and detailed report in its own right. If this information is required we are happy to guide Ofcom to the most suitable sources. However whilst there are obviously similarities in solution design, each manufacturer has their own developed technology each delivering its own unique performance.

The choice of dialler manufacturer and dialler version has a direct impact on the AMD solution available in all installations.

This decision is a key element in defining the reliability of an AMD application.

5.1.1.3 AMD Equipment

In this section we have attempted to summarise how AMD detection works and confirm that the solution chosen has a significant effect on the reliability of AMD.

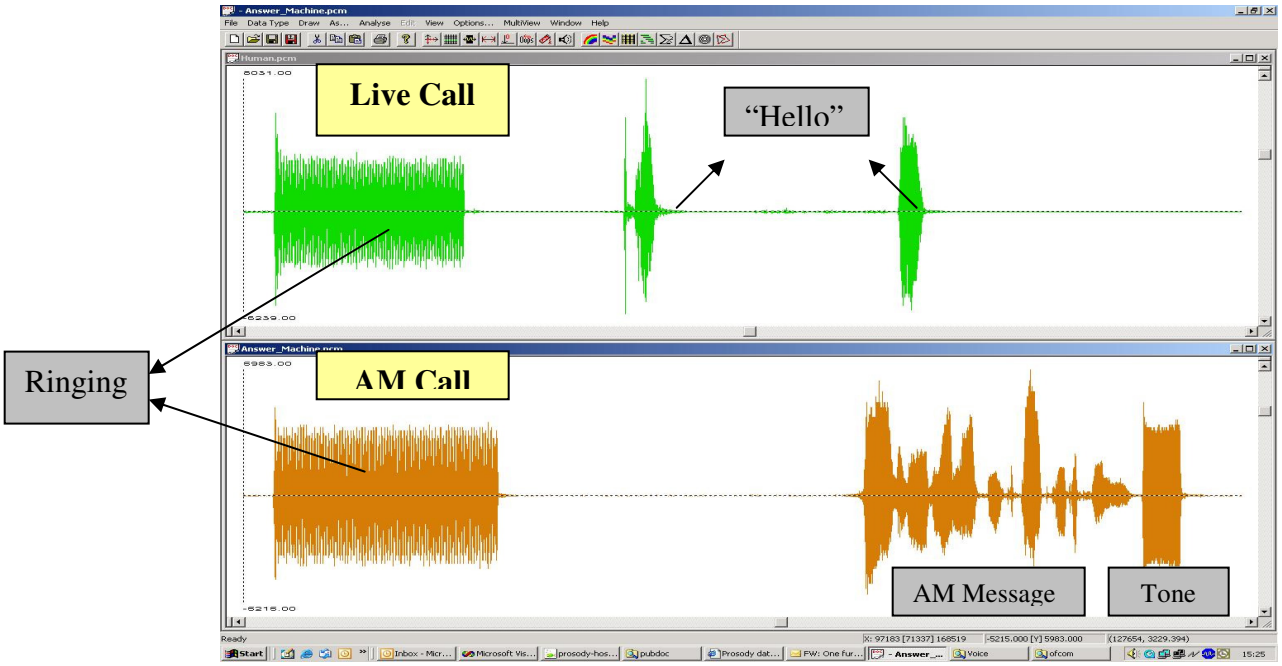
We have been hampered by the understandable reluctance of manufacturers to divulge too much about their solutions and underlying technology. This description is therefore high level and solutions may vary by manufacturer and indeed by individual solution.

The lifecycle of a call can be summarised as follows:

1. **Call Routing** – Call is routed through the network to the Consumers telephone. During this phase calls may be terminated if analysis of network data suggests AM will be used (see below).
2. **Call Ringing** – Call rings at Consumer end – minimum of 15 seconds before termination.
3. **Call Answer –** Live Consumer or AM.
4. **AMD Analysis** – AMD equipment analyses Consumer end communication to assess whether AM is being used. This can last no longer than 2 seconds post Revised Guidelines.
5. **Call Assessment and Action** – After the analysis period, the call is either assessed as an AM and terminated (immediate effect with no message left) or is transferred to an agent. Agent pickup will be immediate or call will be abandoned with message if no agent available (a standard Abandoned call).

Diagram 2 below shows the sound patterns on typical phone calls.

Diagram 2 – Typical Sound Waves



Prior to the audible activity represented above activity will have occurred during the dialling and connection process. Data is exchanged across the network to allow the telephony system to work. This pre ringing communication can also be assessed to understand the likely nature of the call outcome.

The ***entire*** process can be investigated to a greater or lesser extent by AMD equipment as described below.

Standard Detection

In most current installations in the UK what we have defined as Standard Detection processes are used. These are applied **post call pickup** and rely on an analysis of activity occurring at the Consumer end of the line. It must be stressed that however accurate this analysis is, it can only ever be estimation rather than a definitive assessment and cannot be guaranteed to be correct.

The analysis occurs in 3 distinct ways

Stage 1 - **Assessing the time to answer**
Generally landline AMs kick in after 15-20 seconds (BT 1571 generally answers after 18-21 seconds). Any call answered before a pre defined time in line with an identified average AM answer pattern should not be defined as an AM.

This method is less useful when calling mobile phones as a large percentage of calls will be directed straight to the network AM if the phone is switched off or on divert.

This stage should not drive FPs as it should be used only to classify calls as likely non AMs and pass them to live agents.

Stage 2 - Assessing the Consumer end salutation

This is stage that is most commonly identified with AMD. Most live salutations differ significantly from recorded AM salutations. AMD works in this stage by attempting to analyse the salutations against known patterns of response.

In short the equipment breaks the start of the call into small parcels of time and assesses the energy (or sound) on the line during that period. Once energy levels break a certain threshold, the length of time before a pause is measured. This time is then compared against predefined rules (the algorithm). The basic rule generally applied is that a pause of greater than a set amount (e.g. 600ms) within the analysis period (2 seconds) is deemed to represent a live call.

This analysis is finessed to a greater or lesser extent by adding extra layers of analysis e.g. removal of obvious “glitches”, known standard greetings etc.

Therefore the analysis can include some or all of the following factors:

- **Length** – A live salutation is likely to be shorter (e.g. "hello", Jo Bloggs speaking") than a recorded salutation (e.g. "hello thank you for calling, I am afraid I am not in……"). AMD equipment listens for the first long pause.
- **Tone** – Live speech will have different intonation than recorded messages, providing a different pattern. Some AMD equipment will listen for the differences.
- **Known Voice Messages** – AMD equipment can identify known and pre-programmed greetings from AMs and assess the call on these. This is particularly relevant for network AMs such as mobiles and 1571 where the standard greeting is used.
- **Hiss and Click**– Where analogue AMs are used there is likely to be a hiss on the line and a series of clicks as the tape connects. AMD equipment is adept at identifying this background noise. This has become less relevant and useful as the majority of landline AMs are now digital either network or homebased and 100% of mobile AMs are obviously digital.

As is discussed below, this analysis can be effected by external factors at the Consumer end e.g. background noise, length of live greeting, environment of call.

Stage 3 - Beeps

AMD equipment listens for the electronic beep made by the AM.

If a beep happens at the start of the recorded message this is a useful and potentially very reliable analysis. However whilst this may be the case for some older machines, modern digital AMs tend not to beep until the "please leave your message after the tone…" element of the call. This is unlikely to be heard within 2 seconds of pick up, as the greeting message must be played first. Therefore this analysis cannot be used on most calls as detection must occur within 2 seconds to be within the 2 second Guideline.

It is clear therefore that this analysis of call types is based on a series of machine based estimations and calculations as to whether the Consumer end is live or recorded. The machine will get this wrong to a greater or lesser extent and this will drive either FPs or FNs and almost certainly both.

Early Detection

We have been informed by a number of manufacturers that their newest AMD equipment (or soon to be launched AMD equipment) includes new analysis techniques based on the analysis of network communications both before and after connection. We have defined this as Early Detection.

We have not as yet been offered a site on which to test this functionality, nor seen test data from a site with the solution in situ and we are relying on information supplied by the manufacturers. They have expressed a willingness to speak directly to Ofcom to substantiate their claims.

Early Detection works by analysing communications made between the dialling parties and between a dialling party and the network both before and after connection. (Conceptually it is similar to the process that allows an outbound dialling system to be told by the network that it is dialling a deadline.) This is done through an element of the network called a Data or D Channel that runs parallel to the voice channel and is part of the ISDN network. Analysis is based on the following factors:

- Mobile Diverts – Calls diverted to mobile phone AMs or other destinations will send this information down the D channel. This can be picked up by the AMD equipment and the call disconnected pre live connection

- Landline Diverts (1571) - Landline call diverted, including we believe the 1571 service from BT; will send this information down the D channel. This can be picked up by the AMD equipment and the call disconnected pre live connection.

- Immediate Connect – AMD equipment identifies that the call has been picked up immediately e.g. mobile phone switched off, and understands that this cannot be a live answer and therefore must be an AM.

Due to network protocols it appears that this functionality is not available to some types of switch/dialler and in any event only a few suppliers appear to have developed the technology. As stated above we have not been able to test the veracity of the claims.

The analysis is not possible or is very limited for calls made over VOIP. This is due to the voice element of the call requiring all or most of the limited bandwidth currently available for calls. This factor will become increasingly important if and when more Consumers utilise VOIP technology. Currently it is not a standard for VOIP or SIP to define the equivalent of the D channel. Therefore this 'Early Detection' whilst an opportunity, may be short lived if VOIP continues to increase without a data standard being agreed.

Early Detection is currently presented as part of an integrated solution including Standard Detection and it is claimed, greatly increases the reliability of AMD. However if pre connection

analysis alone is used, it does present the possibility of risk free detection all be it at a less comprehensive level than with post connection Standard Detection included.

Summary

Each manufacturer has a different methodology and equipment for AMD and in most cases this will vary from dialler version to dialler version and often from installation to installation as various elements are tweaked to suit client needs.

In summary the specification of the AMD equipment used, and the configuration of it, is a significant underlying contributor to the reliability of AMD.

5.1.1.4 Sensitivity

Diallers can be set to have a more aggressive or passive estimation of the presence of AMs. In simple terms the equipment often will not be certain that a connection is to an AM and it needs to make a decision. It can be programmed to be more or less aggressive in that decision making process. If it is more aggressive it will assume that less certain identifications are AMs, and conversely if it is more passive, it will assume that less certain identifications are live.

The equipment often has this function in the way of pre-set 'levels' of detection or settings at which it can operate. 'Safe' being that if there is any doubt in the AM detection it goes through to an agent whilst other settings reduce the degree of certainty. Functionally this change in sensitivity is often achieved by changing the length of first speech looked for (see 5.1.1.3 above).

We believe that this flexibility is not available to operators using all diallers. Some diallers will have unchangeable "factory settings", although even here we assume this setting can be amended by the manufacturer as required. However on the more advanced and modern diallers, this functionality is available to operators. For instance one of the more popular diallers used has 3 settings of AMD that can be adjusted by the operator on site with relative ease.

A dialler set more 'aggressively' is likely to drive more FPs. It is in effect taking a greater chance with its classification of positives and as such more are likely to be false. Conversely a dialler set to a more passive configuration is likely to drive more FNs as more of the uncertain calls are transferred to live agents and some of these will be AM answered calls. The underlying reason an operation may desire to use the more 'aggressive' setting is that the lower the number of AMs put through to agents, the higher the agent productivity.

In this respect there is likely to be a broad inverse correlation between FPs and FNs i.e. as FPs drop in the more passive environment FNs will rise and vice versa. This effect is considered further in section 6 below.

However care must be taken as this correlation may be contradicted by other factors. For instance, a well set up dialler will have less FPs ***AND*** FNs than a badly set up dialler and a change of campaign may have the effect of changing both either positively or negatively.

However it is clear that how aggressively a dialler is set will have an effect on how many FPs it produces.

5.1.1.5 AMD Analysis Time and the Effect of the Revised Statement Guideline on Abandoned Call Messaging ("The 2 second guideline")

The traditional element of AMD requires an analysis of the first speech of either live Consumer or AM to provide its classification (see section 5.1.1.3 above). It is generally accepted that the more time the analysis can be given the more accurate the detection will be.[1]

The consensus in the industry, from those whom we have consulted, is that 3-4 seconds is the time required to deliver accurate AMD analysis before the law of diminishing returns sets in and increased accuracy tails off. It is worth pointing out that there are dissenting opinions and some manufacturers have made it clear that all the analysis they could do is undertaken in the first 2 seconds.

The Original Statement included a guideline that Abandoned Calls should have a message played *within two seconds of the call being answered*" (cl 6.16). This was further clarified in the Revised Statement to say that a *"….. recorded information message is played no later than two seconds after the telephone has been picked up*" (cl 4.16.2). Inter alia, this guideline has had the effect of reducing the time available for AMD analysis for compliant companies.

Operationally this has resulted in a significant drop in the AMs detected by AMD technology. One operation we have interviewed has seen AMD rates drop from 65% to 30% (i.e. 65% of AM calls used to be detected by AMD technology, now only 35% are). Another operation is running at AMD rates of c5%. The effect of this is twofold:

- The agent productivity benefits of using AMD are reduced as more FNs are generated. This has been so significant to some operations that they have turned off AMD as a result as the benefit was no longer material.
- Total numbers of FPs should be reduced as less automated AM detections are being made, although the FP rate as a percentage of automated AM detects may or may not change.

Conversely the revised 2 Second Rule has undoubtedly had the unintentional effect of increasing FPs for some, less compliant operations. This is the case where for operational efficiency reasons, the same AMD equipment was expected to deliver the same number of FNs (i.e. the same level of agent productivity) with a shorter analysis time. This can only be achieved by being more

[1] This pressure for an extension of the evaluation period has always been balanced against quality issues, particularly in the sales market and generally less so in the Collections market. Consumers are more likely to be more annoyed or put on guard by a long pause. They are also more likely to hang up during a longer pause. This specific matter is more widely considered in section 8 of our report but it is worth pointing out at this stage that there is a belief by some that the reduction in call quality by having any pause at all at the start of the call outweighs any productivity gains driven by having AMD switched on.

aggressive in its detection decision making and hence drive more FPs. The only way that analysis time could be shortened and FPs remain at the same level would be an increase in FNs (and related reduction in efficiency as more agent time is taken up by AM calls).[1]

It has also been stated to us that some dialling solutions are not able to support AMD and play a message within 2 seconds. We understand that this is due to an inability to limit AMD process in time: if AMD is on it takes as long as it takes. We believe that this issue is being addressed in most instances, but has led to a number of manufacturers advising that AMD equipment be switched off.

The time made available for AMD analysis (whether by regulatory of operational decisions) has an effect on its accuracy.

[1] It is of note however that the converse argument has also been made to us that the 2 second guideline has reduced nuisance to the consumer by reducing the pause time at the start of calls.

5.1.2 Telephone Type (Mobile/Landline)

The case has been made to us that there will be significant differences in the reliability of AMD depending on the ratio of landline and mobile calls made. However there is disagreement about which is more reliable. The arguments run as follows:

AMD to Mobile Phones is less reliable
Standard Detection works best when there is no background noise as this tends to blur the live greeting. Mobiles create more background noise for 2 basic reasons:

- Mobile users are more likely to be in situations with significant background noise. Examples provided to us are Consumers standing on railway platforms or on trains during the day and in the pub during the evening.
- Mobile reception is more likely to be poorer than on a landline, creating on-call background noise.

Therefore AMD used on mobile calls is less reliable because live answers are harder to detect.

AMD to Mobile Phones is more reliable
Mobile AM solutions are more standard than home based AM. These are therefore easier to identify. This is clearly true for operators using Early Detection solutions (as described in section 5.1.1.3 above) but is also true for Standard Detection where the analysis can be set to look out for standard network message voice patterns.

Therefore AMD used on mobile calls is more reliable because AMs are easier to detect.

We cannot assess which of these factors is of more weight, and indeed the weighting will probably vary from installation to installation. However it is clear that mobile/landline call ratios have an impact on the reliability of AMD.

It is also worth noting the use of VOIP functionality (e.g. Skype) will have an effect on the reliability of AMD. This is a factor that is likely to become much more important in the future as its use increases.

5.1.3. Callers Situation – background noise

This factor is tangential to the mobile/landline argument made above. In many circumstances a significant part of the mobile / landline AMD variation is not down to the device per se but the situation the holder is in at the time. The greater the background noise the less reliable the AMD equipment and as a result the variation in mobile/landline.

This can be extrapolated into a wider point that says that background noise does have a significant impact on AMD accuracy. It can be assumed for example that in different circumstances or at

different times both mobile and landline background environments are likely to have different background noise patterns.

5.1.4 AM Used

The type of AM used by the Consumer will have an impact on the reliability of AMD.

In general analogue AMs are easier to detect than Digital using Standard Detection techniques. In some cases network digital AMs can be detected early and with a great degree of certainty.

It is believed that the proportion of 'in-house' AM has reduced rapidly with the availability of network based solutions which typically have greater functionality and are provided at a low monthly cost.

It might be expected that over the length of a campaign ratios of AM types will even out to the national average and this factor would be smoothed out. However we believe that whilst this is true of campaigns of a similar nature, demographic factors (see below) will influence the ratio of AM types in the calling pool and this will become a variable factor across campaigns.

Typically towards the end of a calling list or dataset, the proportion of AMs versus Live Calls answered increases, putting more pressure on the AMD equipment.

5.1.4 Demographics

Campaigns are likely to concentrate on a particular section of the community. In sales campaigns this will be driven by marketing and product analysis targeting demographic segments. Similarly collections operations will be led by the underlying demographic of the Consumer base (be it a corporate or public sector operation) as well as the demographic instance of non/late payment.

The argument has been made to us that this demographic variation will have an impact on the reliability of AMD. Again no definitive analysis was presented to us but the following points were made:

- Older Populations – tend to make AMD less reliable. This was explained by a variety of factors as follows:
    - Longer salutations provided by a live consumer making the difference between live and recorded calls less,
    - Longer time to speak post pickup giving AMD equipment less time to analyse the salutation,
    - Fewer AMs in the population. This argument is only valid if one assumes that relatively more errors are made in the classification of Live Calls i.e. False Positives as opposed to AM calls (False Negatives).

- Lower Social Demographic – tend to make AMD less reliable. This was put down to the likelihood of more analogue AMs in this demographic sector and the higher likelihood of background noise.

We have not been able to validate these claims but it appears to be a commonly held belief that AMD accuracy varies by the demographic content of the calling list.

5.1.5 Calling Window

Outbound operations have a wide calling opportunity during the day and evening and throughout the week in which to call. This varies by calling type and regulation in place, but is also significantly flexed by the operations discretion. For instance campaigns targeting older consumers may be undertaken more during the day when they are relatively more likely to be at home, whilst working aged Consumers may be targeted during the evening.

Again these claims are unsubstantiated and vary significantly by campaign but it was commonly stated to us that time of day influences AMD reliability. We suspect this may be down to background noise and AM:live ratios.

5.1.4 - Summary of Effecting Factors

The table below summarises the factors we have identified that influence the reliability of AMD. Based on the analysis we have performed and the interviews undertaken we have also provided an estimate of their relative likely importance. This analysis is indicative only.

Table 3 – Summary of Influencing Factors on the Reliability of AMD

Factor	Summary	Estimated Effect
1 Technical		
1.1 Dialler Manufacturer	Type of dialler used in conjunction with AMD kit	High This defines the platform and functionality available
1.2 AMD equipment used	Type of AMD equipment selected	High This defines how (and how well) AMD can be used. (although some overlap with 1.1 above)
1.3 Sensitivity	Degree of aggression with which AMD is set to classify Answer Machine ("AM") pick ups	High This defines the confidence level at which AMD equipment can assume AM.
1.4 Analysis Time	The time allowed to analyse salutations	Low Assuming 2 second rule is adhered to a centre has no influence on this factor (i.e. only 2 seconds allowed for analysis). High for centres non compliant to 2 second rule (NB overlap with 1.3 above)
2.Telephone Type Called	Landline / Mobile / VOIP (e.g.Skype)	Medium Effect has been described to us as "significant" – but inconsistency as to which way it influences FP Rates and to what extent
3. Consumer Location	Where the consumer is likely to be at the time of the call and what is likely to be in the background	Medium A significant factor in the success of AMD but hard to quantify likely effect or predict variances. Likely to be relatively consistent across operations and campaigns.

Factor	Summary	Estimated Effect
3. AM Type Used	Analogue, digital home, digital network	Medium Significant for some operations and not others. Newer AMD solutions benefit from high network activity. Analogue AMs increasingly rare.
4. Demographics	Classification of Consumers called.	Medium Most interviewees raised it as an issue but most agreed "not the most important factor". However likely to be a true variance across campaigns.
5. Calling Window	When the calls are made.	Low Effect described as "noticeable but not significant" by some and important by others. Likely to balance out across campaigns

It is clear that many factors affect the reliability of AMD from the type of equipment used, how it is applied right through to who is called and at what time of day. Many of these factors interrelate as well making it impossible to derive an objective AMD rate and difficult to create an objective methodology of how it can be calculated.

5.2 Estimates of the Reliability of AMD

5.2.1 Methodology

As has been identified above there can be no definitive view as to the reliability of AMD. Its accuracy fluctuates significantly based on the factors outlined in section 5.1.

However we have attempted to provide some guidance and have concentrated our effort in 3 areas:

- Test Data – we will have tested 7 live sites as part of this project.
- Anecdotal operational statistics – how operations have attempted to calculate their reasoned estimates to date.
- Manufacturers claims – Some manufacturers have provided advice as to the reliability of their AMD equipment to customers and more widely. We have attempted to collate this information.

5.2.2 VC Testing

This section looks at the 7 tests conducted to better understand the actual levels of FPs occurring in contact centres. These tests were in a range of centres that were operating, as far as we could ascertain, to their usual operational practices. The results are intended to be indicative and were completed with the goodwill of the participating organisations.

5.2.2.1 Test Approach

Overview
The testing undertaken specifically for this project has been conducted in a live calling environment.

Organisations have undertaken the tests as outlined below and provided the results and data on the understanding that their identities remain confidential.

A number of separate test methodologies have been used. In each case we have selected the methodology believed to produce the most accurate and valid results with the time and resources available and with a view to validating different test methodologies as detailed in section 7 below. We believe they provide accurate data on the FP rates occurring at the time of testing, but to ensure absolute independent verification of this would require greater resources, timescales and planning than we had scope for in this report.

The default method for testing was to create 2 calling groups, one to operate with AMD turned on, the other with it turned off and the results compared in order to arrive at an estimate for the FP rate.

This section outlines the details surrounding the running of these tests, the data gathered and how this data was interpreted. Alternative test methods are also discussed and the rationales for selecting the above approach as the default method.

Primary Focus of Test Activity
There were many questions and data items that were interesting to review in respect to operating predictive diallers using AMD technology. The primary aim of these tests however was to better understand the number and proportion of FP detections made by the equipment that lead to Silent Calls occurring. Additional information on False Negatives, broader productivity and operational success rates were also helpful in providing additional context to the situation.

The testing was conducted with business to consumer calling or calling that was known to follow a similar pattern and the calls were received by an audience with similar attributes.

Test Methodology

The ideal testing method is to use Trunk Side Recording of all calls made. The effect of trunk-side recording means that the call recorder captures the call from the point the call starts ringing until the call is terminated. By comparison 'agent side' recording would start recording from the point when the call is started by the agent. The use of Trunk Side Recording allows reporting on all the calls made by the dialler. All those classified as answer machines can be replayed and reviewed post event using a live person to listen to these. This person or people can then assess the number that were classified as Answer Machines but were actually answered by live people. This can be summed up as counting the False Positives by listening to the call recordings.

Whilst this is the ideal method, it is rarely feasible. There are 2 main problems with this methodology; firstly it is only a minority of organisations that have such Trunk Side Recording, and secondly it is a very slow and labour intensive method of testing as all calls have to be reviewed. A refined version of this approach is to re-play just a random sample of the calls for manual classification; however this then, again, introduces the variations and accuracy issues associated with sampling methodologies.

The default method chosen was to operate a split test with a group of agents calling with the AMD in use versus a group calling without AMD in use.

Where a split test was used and 2 groups created the test was carefully constructed to ensure as many influencing factors as possible were controlled across both groups. These factors included:

- Group size – number of advisors in each group
- Calling window – time of day and day of week of calling to be identical or comparable between groups
- Target calling list – a single source list was split randomly between both calling groups. This tried to ensure factors such as; age, gender, employment status, socio economic group and other factors were as even as possible.
- Advisor skill levels – teams were of comparable skill and experience level
- Call purpose and proposition – the same position and call objectives applied to both calling groups
- 'Redial rules' and frequency were the same for both groups.

Multiple organisations were sought to participate in these tests with the aim to recruit organisations that span the following factors:

- Geographical reach – no bias to particular regions.
- Campaign diversity – a range of different campaigns with different 'calls to action' covered.
- Industry sectors – a variety in the number of business types and business functions covered.

- IT/ Telecoms technology – a range of equipment manufactures using both 'hard' and 'soft' diallers.

We are pleased to report that this diversity was achieved.

Participant Confidentiality
Participants were offered total confidentiality, partial confidentiality or full disclosure.

Partial confidentiality identifies participants by name, but no data collected is identified as coming from that participant organisation. Many of the data fields collected were required to demonstrate that a broad section of customer groups, operation types and regions participated although do not form a key part of the reporting herein

All participants opted for total confidentiality.

Data Collection Relating to each Test Group
A specification of the minimum data items that were sought from each group at each site is detailed in Appendix 2. Where there was additional data available this was also collected, conversely if data wasn't readily or easily accessible then the impact and validity of any test was reviewed on a case by case basis.

Onsite Authentication
A member of the project team supervised each of the tests within this activity in order to act as an independent auditor and certify that there was no known or apparent bias during the test. We also reviewed dialler reporting and AMD rates in the periods surrounding the test window to ensure consistency of activity.

It is acknowledged that this did not remove participants ability to skew or influence the results entirely, however based upon participants overall agreement to take part and manage the test to the best of their ability it was considered a small risk.

Test Group Size
Participating organisations were asked to provide 2 groups to operate at the same time during their calling hours. The team sizes sought for each group were at least:

- 10 advisors
- Operating for a duration of 4 hours or more

The test size was driven by a practical approach in order to provide results as reliable as possible, whilst not causing a prolonged or significant disruption to the contact centre operations and business performance.

Limitations to these Trials

There are inherent limitations to these trials and the test activities. It is acknowledged that whilst every effort has been made to apply as robust methodologies as possible, using solid quantitative research techniques, ultimately conclusions are qualitative in nature. The time frame, budget and ability to operate within the live contact centre environment all limited the scope and ultimately reliability of conclusions that can be drawn from the datasets.

It is for these reasons that whilst best practice has been pursued, the conclusions and range of results presented must be considered as indicative results rather than irrefutable.

The aim was to indicate the range of AMD accuracy with respect to FPs currently being achieved in the industry by taking a snap shot at a handful of operations believed to be fairly typical. We have not nor could not deliver a statistical analysis of its use.

5.2.2.2 Test Results

This summary and conclusions section of the report is intended to present key findings and conclusions from the tests undertaken at numerous sites. The details of each test site, the methodology selected and the results and conclusions for each are shown on a per site basis in Appendix 2.

It must be re-stated at this point that these tests were not designed to provide irrefutable evidence of the FPRs of specific operations, campaigns, companies, or manufacturers of equipment. Due to the nature of this project variations on test methodologies have been used in order to provide qualitative feedback on test feasibility, difficulties and preferences from a practical perspective.

Table 4: Site Description and Business Activity Summary

AMD Technology incorporated within these tests

Due to the potential linking of customer results with dialler manufacturers and broad brush inferences that may be incorrectly made as to the adequacy of dialler manufacturers' products we have not associated the equipment with the results obtained. The following equipment was included within these tests, listed in alphabetical order:

Summary False Positive Rates

We discovered numerous different methods of calculating and presenting the FP rate achieved by an operation. Whilst each has a role within understanding and managing an operation perhaps the 2 most useful here are expressing the False Positive rate as a percentage of system identified answer machines and as a percentage of Live Calls answered. These are further explained in Section 6 below.

Whilst the figure for the level of compliant Abandoned Calls is also shown in the table below, it is not suggested that this is related to the number or proportion of FPs. It is shown to easily understand and assess if the overall operation, once FPs have been considered along with compliant Abandoned Calls, is likely to breach the maximum allowable rate of 3%.

Table 5 – Summary of Results

Factor	Site 1	Site 2	Site 3	Site 4	Site 5	Site 6 A	Site 6 B	Site 6 C	Site 7
Answer Machine rate (AMD off)	27.6%	n/a	9.4%%	31.2%	19.8%	45.0%	38.2%	31.4%	24.68%
Answer Machine rate (AMD on)	29.0%	52.0%	13.2%	14.4%	28.8%	44.7%	38.6%	32.2	25.7%
AMD System Answering Machines (%)	10.3%	52%	8.4%	13.2%	19.9%	36.4%	34.1%	29.9%	10.5%
False Positive Rate with AMD (% of system identified AMs)	13.5%	0.58%	44.6%	20%	45%	0%	1.18%	2.79%	9.7%
Compliant abandonment rate (no AMD FP factored in)	1.56%	0.63%	1%	1.1%	4.14%	3.1%	0%	1.58%	2.34%
Total Abandonment Call Rate	4.75%	2.3%	10.6%	9.28%	33.2%	3.1%	1.19%	3.78%	3.6%
AMD increase in Decision Maker Contacts / hr	9%	-	17%	-	-	13%	-	12%	-
AMD increase in sales / hr	Nil	n/a	11%	3%	n/a	-	-	-	-

See Appendix 2 for calculations and further explanation

Summary Table Narrative

This brief narrative illustrates how to interpret the table above, using site one as an example.

Test site one experienced an answer machine rate of 27.6% when they were not using their answer machine detection technology. When they turned this on the apparent level of answer machines detected rose to 29.0%. The equipment did not identify all of these answer machines, it detected10.3% the remaining 18.7% were calls put through to agents which were actually answer machines (i.e. false negatives). Before any allowance for AMD false positive calls was made, this operation was operating with a 1.56% compliant abandonment rate. Our calculations showed that of all the system identified answer machines detected it is likely that 13.5% of these would be false positives (i.e. a live person answered the phone but the equipment wrongly identified them as an answer machine and terminated the call). The calculation for the total abandoned calls, which includes the 'compliant abandoned calls' and the estimate for false positive calls showed that the

operation was operating at a total abandonment level of 4.75% and thus exceeding the 3% maximum limit. With the AMD functionality turned on this operation spoke to 9% more decision makers per hour.

5.2.2.3 Test Conclusions

It is outside the scope of this report to make specific recommendations regarding the ongoing use or accuracy of AMD technology. A number of observations can be drawn together though which we believe will assist in the further consideration of how to address the use of AMD and any additional guidance form Ofcom.

At first inspection of the summary performance table data it is clear that there is an enormous range in the level of FPs being achieved from the different test sites. The range is from as little as half of one percent to as many as nearly 45%, or put another way as few as 1 in 200 to almost as many as 1 in 2.

These percentages allow us to draw conclusions as the accuracy of The AMD equipment; they cannot be used to assess compliancy. That is because the incidence of answer machines amongst the calling lists also varies dramatically as did the ratio AM calls passed to live Agents.

As mentioned later within this report, most operations welcomed the opportunity to comment upon and if possible participate within this project. We believe that this demonstrates the collective concern and appetite that many within the industry have to better understand the impact of AMD technology and the requirements from Ofcom for measuring and recording estimated FPRs.

We believe that a further clarification and discussion paper that presents in detail a number of methods for testing and then estimating the False Positive rates that will be acceptable to Ofcom will be very welcome and well received by the industry. This would need to discuss frequency of testing and scale of testing that is deemed to be required as well as the appropriate evidence required for audit purposes (see section 8 below).

5.2.3 Operator Statistics

Since the Revised Guidelines were published in September 2008 all operators have been required to include a reasoned estimate of FPs in their calculation of abandoned rates on a campaign and site basis.

This has driven a number of responses that can be summarised as follows:

Table 6: Operator Views of testing

	Strategy	Implication
1	Undertake on-site testing based on their campaigns and base decision of ongoing use on outcome of testing	▪ Ofcom's desired outcome – operators are finding a relevant and reliable FP rate and should incorporate it into Abandon Rate calculations. ▪ Risks are: - testing done inadequately and wrong result derived (see below), - Testing not done frequently enough- Ofcom's view on required testing frequency not clearly defined/understood.
2	Shut off AMD without testing	▪ The safest outcome – FP will disappear ▪ Risks are: - Operational efficiency is being reduced and viability of operations threatened unnecessarily - Operators feel bullied into action and view of Ofcom is diminished - Operators seek to find alternative means to improve productivity without AMD which has other consumer impact.
3	Prepare to rely on manufacturers claims (see section 5.2.4 below)	▪ As discussed below – we believe that most manufacturers' claims are not robust enough at this stage, or if they are very robust evidence of this is not apparent. ▪ Ofcom has publicly stated that it is unlikely that manufacturers' claims on their own will form an acceptable basis for a reasoned estimate.
4	Ignore the FP issue and hope the problem either goes away or does not manifest itself (the Revised Guidelines currently only become directly actionable if a site is investigated as there is no proactive requirement)	▪ The worst outcome and one that appears still to be reasonably prevalent. ▪ Some operators have taken the view that the cost of switching off AMD outweighs the possible fine and bad publicity of an investigation and are continuing to use AMD. ▪ Other operators appear not to have considered the matter and are continuing to use AMD as before.

Our interviewed sample of the market is not wide enough to provide an estimated percentage split across the strategies, but we do know that each of these strategies has been employed.

Tests Employed by Operations

This section summarises the tests types we have been told have been undertaken in the market. We have split the tests into the categories we have defined and discussed in section 7 below.

Table 7: Operator Tests Undertaken

	Frequency
1. Live Call Sampling	
Trunkside	Where functionality is available this has been used and we believe used effectively. However time and cost of set -p and assessment has meant that it has only been done once or very infrequently
Agent Validation	None undertaken
Side By Side	Used in a number of instances. Issues with ensuring comparability of data and recording of accurate levels of real AMs.
2. Staged Calling	
Live	Undertaken by a number of interviewees under a number of variations - Calls made to known numbers on site either answered by employee or known AMs - Wide variety of AMs set up and test called ("there's only one we can't identify") - Calls made externally to known AMs and live answer (e.g. employee at home)
Laboratory	None undertaken by operators. Much reliance on data from manufacturers
3. 100% Analysis	
Agent Listening	None undertaken
Technology	None undertaken – NB we believe this is not technically possible

Again our survey across the market does not allow us to make statistical estimates, but we can make the following broad conclusions:

- Some operators have undertaken testing of their FP rate in one off tests. In some cases this has led to AMD being switched off. We are unaware of any ongoing programmes of campaign testing.
- There is general confusion as to how much testing needs to be done and to what extent manufacturers claims can be relied upon
- Non compliant organisations are still ignoring the Guidelines and will not have tested their FP rate.

5.2.4 Manufacturers' Claims

Much of the feedback we have received in our research has been on and around the matter of manufacturers claims as to the reliability (or not) of their equipment. This section summarises our findings. We have been able to speak to a number of dialler manufacturers representing hundreds of installations in the UK.

Definition
In the term "Manufacturer" we include makers of hard and soft dialler solutions and suppliers of the underlying technology that makes AMD function.

5.2.4.1 Overview

In the current climate and due to the lack of an obvious alternative, operators have been pressing their manufacturers to provide a statement of reliability on which they can rely. This has provoked a variety of responses in manufacturers: some have obliged, some have remained silent and some have stated that their AMD technology does not comply.

The matter is further complicated by the complexity of the market where solutions are created with a variety of sub-contractor agreements and the Operator is often significantly distanced from the ultimate AMD manufacturer. This results in some confusion for the Operator and at times contradictory advice in the market.

During this study, the only manufacturers' test data that was available was from tests conducted in 'lab conditions'. For the reasons covered in section 7 of this report, and until evidence emerges to prove a link between manufacturers test data and live environments (see below), we do not believe such claims should be relied on.

One important fact to note is that manufacturers on both side of the argument have a commercial drive to promote their view in addition to their technological view. It is not our position to comment on the relative importance of each of these factors in the corporate views we have heard, but in most cases they are both likely to be present.

5.2.4.2 Summary of Manufacturers Views

There is a diversity of manufacturers' claims currently being made around FP and the 3 Percent Rule.

View 1

A number of manufacturers are stating that their AMD technology cannot be guaranteed to dial compliantly within the 3 Percent Rule. The maths for how FP rates can be incorporated into the 3 Percent Rule is discussed in section 6 below, but in effect manufacturers are saying that at expected AM rates and AMD rates, their FP rate is at such a level that the 3% Abandon Rate is likely to be breached either with or without additional Abandoned Calls delivered by the normal operation of the dialler.

Of the manufacturers we spoke to over half were of this view. Further stats provided were:

- Manufacturer A – of our 30 UK installations all but 4 have switched off AMD
- Manufacturer B – "As recommended by us, 80% of our clients are not currently using the technology"
- Manufacturer C – "[for this solution] ….at this time we recommend that AMD be switched off"

View 2

The second view held is that whilst old technology may not allow compliant dialling, new versions now on the market do allow it and that AMD equipment has been tested and delivers FP rates that allow this to occur (i.e. well within the 3% allowed). The ability to be compliant is further increased when you consider the reduction in AMD rates described in section 6 below.

We believe that the tests undertaken have predominantly been staged calls or laboratory tests. If this is the case and as discussed in section 7, we believe this test methodology is flawed and would need to be substantiated by test analysis in a live call environment. We are aware that some manufacturers are currently undertaking live testing with their clients and hope that this data is made public.

It may well be the case that manufacturers are best placed to undertake tests for their clients. If these are undertaken objectively they are just as reliable as any other test. Furthermore if over time a consistency of FP rates can be established across a given application (as we suspect may be the case) it may be that this empirically proven manufacturer claim could be relied upon.

View 3
We have been unable to identify any manufacturer that claims all their equipment regardless of vintage can be used compliantly.

5.2.4.3 Actual rates Quoted

The following rates have been quoted to us as test results:

Table 8: Manufacturer Quoted Accuracy Rates

	Statement of Accuracy	Implied FP rate
1	Solution accuracy of 98.9%, live answered accuracy 99.9% AM – 94.3%	This implies a FP rate of 0.1%
2	Accuracy of 95%	This implies FP and FN account for 5% of calls, it was undisclosed how this was split
3	Detection of Human voice: 90-92% Detection of AM – 88%-90%	This implies a FP rate of 8-10%
4	Overall correctness 96%	This implies FP and FN account for 4% of calls, it was undisclosed how this was split
5	2.5% FP rate in unofficial tests	2.5% FP rate
6	Live voice accuracy of 98%	2% FP rate

In addition a number of manufacturers stated that their solutions could not be compliant without providing numbers.

No manufacturer claimed that their solutions could be guaranteed to deliver zero FPs. This has relevance when considering the 2 Second Guideline.

5.2.4.4 The 2 Second Rule

We challenged manufacturers on how AMD equipment could comply with the 2 second rule given the certain creation of at least some FPs[1].

Without exception they stated that the technology is in place to ensure all AM calls could have a message played on them, but none was aware that this was occurring.

[1] The argument is detailed in section 6 below, but in short is as follows: the Revised Guidelines state that all abandoned calls must have a message played within 2 seconds of pickup. A FP is not identified by the system as an abandoned call and so will not have a message played unless all AM calls have such a message. This will drive repeat part messages left on AMs and create its own nuisance.

5.3 Conclusions on Reliability

It is apparent that the accuracy of AMD technology and the volume of FPs created are subject to numerous variables. We would further argue that even within campaigns, rates may vary when certain factors are changed. These may include changes to equipment used, dialler settings, operational factors and data called.

It is likely that similar dialler/AMD products will drive similar results for similar campaigns but there is no certainty yet given the number of variables in play and the lack of live testing.

FPs are created by a mistake that by its nature goes undetected and all equipment will always treat FPs as correct positives and record them as such. As a result, and as discussed in section 7 below, the AMD FP rate is impossible to assess on a real time basis and so cannot be managed by anything other than broad brush actions. Moreover the success of these actions cannot be assessed until long after the moment has passed. This is in stark contrast to the techniques open to dialler managers to micromanage and control other Abandoned Calls. It is difficult for operators to assess and react to changes in the variables we have discussed above.

It is this effect of not knowing how large the problem is and how to manage it down, coupled with the complexity of the issue, that we believe has encouraged the industry to largely ignore the problem up until last September. The Revised Guidelines have thus thrown a stone into previously artificially calm waters and hence the confusion now.

We have undertaken some testing in the market utilising a variety of methodologies. We believe that operations should be able to undertake acceptable testing processes at a reasonable cost to establish their FP rates. How regularly retesting will need to be undertaken will be driven by the variance in results delivered (see section 7 below).

Our findings are indicative only and should not be relied on to form policy or judge the market. However they do indicate a wide range of FP rates occurring in the market delivering compliant and non compliant results. Our testing has shown FP rates from 0.5% to 45% delivering an Abandon Rate Contribution (FPC) from 1.5% to 29%.

The impact this has on businesses operating within the Guidelines laid down in the revised Statement are considered in the next section of our report.

6 Examine the scenarios which might affect the likelihood of a call centre utilising AMD being able to comply with the Abandoned Call rate as set out in Ofcom's *Revised Persistent Misuse Statement*

6.1 Overview

This section considers the following matters:

- Analysis of how FP rates interrelate with The 3 percent Rule given relevant variables and assuming certain FP rates.
- Strategies that might be employed to ensure compliance.
- Further consideration of the 2 second rule and compliance/non compliance of FPs.

6.2. Analysis of how FP rates interrelate with The 3 percent Rule given relevant variables (AM:live ratios).

This section shows how the basic FP rate as provided by a "reasoned estimate" transforms into a contribution to the overall Abandoned Rate.

The Abandoned Rate is primarily the rate of calls over-dialled by an operation using a predictive dialler. This is done to increase agent productivity by ensuring calls are available as agents become available. It has been effectively capped at 3% by the Guidelines.

Out of scope of the report is a detailed calculation of how operations might calculate this percentage from available operational data and the creation of a detailed arithmetical formula needed if operations are to create a measurement protocol. We are aware that this is being worked on by other agencies and believe it will be made available to Ofcom.[1]

[1] The pertinent issue is that some of the variables assumed in our calculation, and acceptable for illustrative purposes and scenario modelling, cannot be derived from data available to an operation e.g. actual Live Ratio or AM ratio. These would have to be calculated from other data.

6.2.1 Variables and Formula

The variables that effect the transformation of FP Rate to Contribution to Abandoned Rate ("FPC") is as follows:

- Dials Made ("DM") — The number of dial attempts made.
- AM Ratio ("AMR") — The percentage of records that are answered by an Answer Machine (Am calls).[1]
- Live Ratio ("LR") — The percentage of records that are answered by a live Consumer.
- AMD Rate ("AMDR") — The percentage of AM calls detected by AMD equipment (including FPs). The opposite of this percentage is False Negatives i.e. AM calls passed on to live agents. (NB this is the rate has been reduced for many operations by the introduction of the 2 Second rule.)

In short to become the correct percentage, The FPR has to be adjusted for 2 factors:

- To reflect and be reduced by the ratio of AM calls sent to agents (False Negatives)
- To be expressed as a percentage of the same denominator as the Abandoned Rate (calls passed to live Consumers whether abandoned or not)

In Formulaic terms the calculation can be expressed as:

$$\mathbf{FPC} = \frac{\mathbf{(DM \times AMR \times AMDR \times FPR)}}{\mathbf{((DM \times LR) + (DM \times AMR \times AMDR \times FPR))}}$$

[1] It is worth noting that whilst in reality live rate and AM rates may move equally and oppositely this is not definite as there is a balancing figure of non connects. As a result the two variables must be included.

6.2.2. Analysis

We have modelled various scenarios based on the variables described above. Our detailed analysis is provided in Appendix 3 and summarised below.

6.2.2.1 Base Model

Our base model assumed the values in the table below. These have been derived from what we understand to be typical values in the industry for contact rates and what is a high AMD rate post the 2 Second Rule.

Table 10 – Base Data Summary

Total Calls	10000
AM rate	40%
Live Rate	40%
Non connect	20%
AMD rate	70%

The results for various FPRs are as follows.

Table 11 – Base Scenario Outcome

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

For ease of understanding we have colour coded FPC as follows:

Green: less than 1% - likely to allow ongoing effective predictive dialling and remain compliant.
Amber: 1% -3% - likely to make the value of predictive dialling marginal as over dialling will have to be significantly curtailed/removed to ensure compliance.
Red: Greater than 3 % - defined non compliance to The 3 percent Rule by FPs alone.

It is clear that only very low levels of FPR drive an acceptable FPC in this scenario. Any rate above c4.5% would create immediate non compliance and we would suggest that rates much above 1% would have such a detrimental effect on the effectiveness of predictive dialling (due to related required reduction in over-dialling) that it makes compliant AMD use marginal.

6.2.2.2 Amending the AM Rate and Live Rate

A reduction in the AM Rate increases the tolerance around FPR. The table below reflects a 20% AM rate as opposed to our base of 40%.

Table 12
AM Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.35%	0.70%	1.38%	1.72%	3.38%	4.99%
Percentage change from base	-49.8%	-49.7%	-49.3%	-49.1%	-48.3%	-47.5%

In this scenario what we have defined as an acceptable FPC is now derived from a 2% FPR and red performance only starts at c9%. However it is of note that this increase in tolerance is created by less AMs being available for detection and as such the value of AMD technology is reduced i.e. the absolute number of AM detects will be less.

Conversely if the AM Rate is increased, the compliant FPR is reduced significantly. In our scenario, at 60% AMD rate – all FPR rates are non compliant above 2%.

Amending the Live rate

This works in the opposite direction to the AM rate. As the Live Rate increases so the FPC derived reduces and as the Live Rate reduces so the FPC increases. This is due to changes in the denominator of the Abandon Rate equation.

The table below shows the change in FPC if the live rate is reduced to 20% with no change in other variables.

Table 13
Live Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	1.38%	2.72%	5.30%	6.54%	12.28%	17.36%
Percentage change from base	98.6%	97.3%	94.7%	93.5%	87.7%	82.6%

Table 14
Live Rate Reduced/ AM rate increased

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	60%	60%	60%	60%	60%	60%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	2.06%	4.03%	7.75%	9.50%	17.36%	23.95%
Percentage change from base	195.9%	191.9%	184.5%	181.0%	165.3%	152.1%

This last scenario represents a situation where AMD would potentially be of most benefit to an operation: where AM calls are high and Live Calls are low. Without AMD agents will spend significant amounts of time dealing with AM calls. However it is the scenario where AMD will contribute most to the Abandon Rate and would be very difficult to run compliantly at any significant level of AMD rate.

6.2.2.3 AMD Rate

The other variable to the equation is the AMD rate. This is the percentage of AMs identified as such by the technology (including FPs) and not passed to agents as False Negatives. As might be expected, as this percentage reduces so more tolerance is allowed on the FPR. Two scenarios are modelled in the tables below and the base model is restated.

Table 15 – AMD Rate Scenarios

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

AMD Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	35%	35%	35%	35%	35%	35%
FP Contribution to abandon rate	0.35%	0.70%	1.38%	1.72%	3.38%	4.99%
Percentage change from base	-49.8%	-49.7%	-49.3%	-49.1%	-48.3%	-47.5%

AMD Rate Significantly Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	5%	5%	5%	5%	5%	5%
FP Contribution to abandon rate	0.05%	0.10%	0.20%	0.25%	0.50%	0.74%
Percentage change from base	-92.8%	-92.8%	-92.7%	-92.6%	-92.4%	-92.2%

It is clear, perhaps obviously, that at low values of AMD rate the technology can be used compliantly to much higher levels of FPR. It appears that due to the restrictions of the 2 Second Rule operators trying to be compliant are running at low AMD rates. We have seen AMD rates as low as 5% and they appear to be averaging at c50% (see section 8). At such a level the operational benefits of AMD would have to be questioned, but equally operators are very unlikely to be breaching the 3 Percent Rule due to FPs.

6.2.3. Conclusion

The maths behind the Abandon Rate calculation means there are 3 key variables in converting a False Positive Rate into a Contribution to the Abandon rate. These are the ratio of Answer Machine Calls, the ratio of Live Calls and the ratio of Answer Machine calls detected by the technology.

In our base model of 40% AM, 40% live and 70% AM identification any FPR above 4.5% will create non compliance and we would argue that a rate above 1% would be of marginal benefit for a compliant organisation.

In a scenario of high AM calls and low Live Calls (the most attractive operational scenario for AMD), FP rates must be lower to ensure compliance.

The situation changes significantly when the AMD rate is reduced and a greater level of FPR is allowed. We believe that compliant organisations have seen a reduction in AMD rate as a result of trying to become compliant to the 2 Second Rule that has reduced the analysis time available. At the low end of AMD rates we have come across, any practical level of FPR will allow compliance although the benefit of AMD at those levels is very limited.

6.3. Strategies that might be employed to ensure compliance

So far we have considered variables and operational processes as static throughout a campaign. This section briefly considers strategies that might be employed during a campaign to reduce the overall FPC rate.

Time Limited Use
Operators may wish to have AMD switched on only for a pre defined ratio of the calling day selected at random. Over time this would have the effect of linearly reducing the overall FPC for the campaign e.g. if AMD is switched on for only 50% of the time the overall FPC would be halved.

This has the benefit, if done at random, of being simple and delivering a known outcome, assuming the base FPR is known. It has the disadvantage of not targeting either AMD use in the times when it would be most productive nor at the times when it would deliver the highest compliance benefit.

Calling Period Use
Operators may wish to limit AMD use at specific times of the day when they know that AMD is likely to be delivering higher levels of FPC to Abandon Rates. As discussed above these periods will be when live answers are lowest and where AM answers are highest.

The advantages of this are that the FPC rate can be reduced in a targeted way allowing wider use of AMD at other times. The disadvantage is that the periods where it would be switched off are very likely (if not certain) to be the periods where AMD would deliver most operational efficiency benefit.

Campaign Maturity
Operators may wish to limit AMD use over the course of a campaign. It is generally true that at the start of a campaign/data file live answers tend to be higher and AM lower than average. As the campaign progresses and live answered calls drop out of the calling file AM rates increase. Under this option the operator would use AMD towards the start of a campaign and would curtail its use towards the end.

As for the calling window option described above, the advantages of this is that the FPC rate can be reduced in a targeted way allowing wider use of AMD at other times. The disadvantage is that the periods where it would be switched off are very likely (if not certain) to be the periods where AMD would deliver most operational efficiency benefit.

6.4. Compliance to the 2 Second Rule

Whilst strictly out of scope of our report, this factor has a significant bearing on many of the issues in our report. It has been considered throughout our report and we wanted to summarise all the factors in one place.

There are two factors considered in the following sections.

6.4.1 Effect of the 2 Second Rule on FPR and AMD rates

It has been represented to us by Operators that the application of the 2 Second Rule, particularly given the new definition of "2 seconds from pickup" in the Revised Guidelines, has had one of the following contrary effects on their operations. Either:

1) Increase in False Positive Rates – As the technology has less time to assess the call type, it is guessing more for the same levels of productivity and as such is delivering more FPs. The veracity and impact of this outcome is hard to quantify. Or;
2) Increase in False Negatives (reduction in AMD rate) - As the technology has less time to assess the call type a less certain estimation can be made and therefore more False Negatives will be created. We have witnessed AMD rate fall as low as 5% i.e. 95% of all answer machine calls have been passed to agents.

In essence the difference in outcome can be explained as follows: organisations experiencing the former are demanding the same level of AM detects with less certainty, the latter are demanding the same level of certainty of diagnosis with less evidence to go on. It appears to us that the first outcome is created by operations wishing to maintain operational efficiency and are less interested in compliance. The second is the outcome from organisations wishing to remain compliant who have reduced the aggressiveness of their AMD technology in an attempt to remain compliant.

Anecdotally we have been told that the resulting reduction in agent productivity as a direct consequence of trying to undertake diagnosis within 2 seconds and remain complaint has been upto 10%. This reduction is manifested in an increased number of AM calls being passed to agents (False Negatives) per scenario 2 above.

It is also of note that a number of manufactures are struggling to produce equipment that ensures compliance to this aspect of the 2 Second Rule i.e. producing AMD equipment that can be stopped after 2 seconds from pick up to ensure a message can be played at that point or transfer to an agent made. We suspect this, rather than concerns over the 3 Percent Rule is why a number of them have advised clients to turn AMD off.

It is clear that operating AMD technology and remaining compliant to the 2 Second Rule has created significant issues for a lot of operators.

6.4.2 FP Compliance to the 2 second Rule

The Issue
Section 2.8 of the revised Guidelines state:

> "In Ofcom's view, calls abandoned as a result of AMD False Positives are unlikely to be accompanied by an information message, so these abandoned calls will also be silent calls."

We would fully concur with this statement. As stated in section 5 of our report no manufacturer or operator has claimed that AMD technology will deliver zero FPs. At the same time messages cannot be left on FPs without leaving messages on all AM calls, something that is not done for obvious reasons and would likely create significant nuisance to Consumers.

Section 4.16.2 of the Revised Guidelines outlines the details of the message to be played in the event of an Abandoned Call. Unlike 4.16.1 where a tolerance level of 3% is provided, 4.16.2 provides no tolerance level and the conclusion has to be that all Abandoned Calls should have a message played in line with 4.16.2 or be non compliant.

Finally Section 4.17 states:

> "Ofcom considers that non-compliance with the guidance at paragraphs 4.16.1 [the 3 percent Rule] and 4.16.2 constitute serious acts of persistent misuse in particular."

It has been pointed out to us by numerous operators and manufacturers that they do not understand how they can be complaint using a technology that everyone admits is guaranteed to deliver some silent calls.

The Effect

We believe the effect of this Revised Guideline is to make all AMD technology users non compliant. Whilst they can attempt to minimize the non compliance by reducing FPs, if they continue to use AMD technology they will be non compliant as they will inevitably make some Silent Calls.

6.4.3 Threat of "Voiceblast"

It is of note that The Guidelines are applied to calls that are intended to have a live agent present. Some companies have expressed a view that the harder it becomes to comply with The Guidelines, the greater the attractiveness of using 'voiceblast': 100% automated outbound that plays an outgoing message. In their view this would become a nuisance significantly greater than current levels of Abandoned and Silent Calls, but currently would fall outside the Guidelines.

7 Identify types and sources of information available to contact centres which may be used by them to make a reasonable estimate of AMD False Positives.

7.1. Background

The Revised Guidelines (clause 4.16.1) state that:

"*the 'Abandoned Call' rate shall be no more than three per cent of 'Live Calls', calculated per campaign (i.e. across call centres) or per call centre (i.e. across campaigns) over any 24 hour period, and shall include a reasoned estimate of AM Detection (AMD) False Positives"*

Footnote 16 goes on to provide more detail around how an estimate of False Positives may be calculated as follows:

"*Providers may wish to actually test their equipment in order to provide an actual False Positives figure to Ofcom in the course of an investigation. Accuracy of AMD could be tested by comparing the differing connection rates when it is on and off or by making test calls to a range of numbers where the actual presence of an answering machine is known in advance. Providers could listen to a range of calls where AMD is being used. Calls where an AM is detected could also be passed to live operators for a limited period and this may help to quantify numbers of False Positives. Alternatively, where testing is not carried out, providers may supply Ofcom with their own reasoned estimate (as a percentage of total calls identified as being answered by an AM) of the extent of False Positives incurred where AMD is being used. Ofcom will then determine whether such an estimate is in fact reasonable, based on evidence provided to it by a provider to substantiate its estimate.*"

In summary the Guidelines suggest that methods of testing may include:

- Comparing detection rates when on and off
- Making test calls to known outcomes
- Listening in to calls when AMD is on
- Passing AM detected calls to live operator to assess accuracy of classification
- Supply a reasoned estimate from other sources.

This section attempts to provide a more detailed framework for testing, based on the following criteria

- Best practice testing and sampling methodologies;
- What we believe is practical in the industry;
- What is currently being undertaken by operators as a result of the Revised Guidelines (see section 5);
- Our experiences of undertaking tests (see section 5);

7.2. Test Framework

7.2.1. Best Practice Theory

We have assessed the data and test methodologies available against the following principles.

Table 16 – Testing Methodology Principles

Live Data	▪ Testing on Live data is always preferable to scenario calling. ▪ Given the variables that influence AMD accuracy rates (see section 5 above), we would be wary of accepting any conclusions from non live scenarios.
Relevant Data	▪ The guidelines imply that reasoned estimates should be calculated on a campaign or a per centre basis. ▪ We believe best practice would be to provide reasoned estimates whenever campaign data changed to the extent that it materially changes AMD reliability rates. ▪ As discussed above (section 5) this could be for a variety of reasons.
Operational Metrics	▪ The reasoned estimate should be calculated in an operational environment the same or materially the same as that in which regular calling occurs. ▪ This means that all operational variables should remain unchanged for the length of the test and should be equivalent to non test environments. ▪ For instance AMD sensitivity, calling windows and other operational metrics should remain unchanged
If sample testing is to be undertaken, the following principles should be applied.	
Actual Event Analysis	▪ Where possible actual AMD classifications should be analysed rather than side by side comparisons
Observer Interference	▪ The test should not be allowed to interfere with the process being tested
Sampling	▪ Should be robust enough to give high confidence levels across the population being tested. ▪ This is likely to include different times of day, days of the week.

7.3. Tests Available

Based on our research and assessment of the market we have identified the following methodologies for arriving at a "Reasoned Estimate".

7.3.1 100% Analysis

The ideal solution to identifying the FP rate would be to have every dial that has been identified as an AM checked to identify whether it was a FP or a correct positive. Theoretically this could be undertaken in 2 ways:

- **Agent Listening**
  Staff could be set up to listen to live dials or, if Trunkside[1] Recording is available, recorded dials, and assess which AM calls were FPs. Human error aside this would give a complete and accurate calculation of FPs.

  However we believe this solution is impractical. If the listening is done live the number of people needed to be rostered to listen in would be guaranteed to make the operation uneconomic. If the calls were recorded and listened to subsequently the cost could be reduced, but we believe would still be prohibitive.

- **Technology**
  It has been suggested to us that a technology solution might be put in place to assess all AM calls to identify FPs. This would involve a more in-depth assessment of these calls than is allowed by the 2 second rule and is applied by standard AMD processes.

  We do not believe this is practical. FPs are by definition errors in the technology used to classify calls as AM or not. Any retrospective assessment of FPs would be based on the same technology and would be likely to make similar errors. Some FPs might be identified but it could not be guaranteed that all would. Therefore the FP rate would be unreliable.

In summary we do not believe that a process can be put in place that accurately calculates FP rates on an absolute basis. This is acknowledged by Ofcom in that they have asked for a "Reasoned ***Estimate***".

[1] Call recording applications work in one of two ways – either Trunk side or Agents Side. Trunk Side records all dials made from the centre. Agent Side records only calls connected to an agent. Therefore only Trunk Side recording would be able to record AM Detected calls (and within that, FPs) as they are disconnected before they reach an agent. However Trunkside recording is more expensive than Agent Side recording as a significantly higher number of lines would need to be recorded for, this issue aside, very little benefit. As a result few centres have trunk side recording functionality.

7.3.2 Staged Calling

This is a methodology used by a number of operators we have talked to and is the basis for most, if not all, manufacturers' claims. A Reasoned Estimate is calculated by test-calling to known outcome numbers. This occurs in one of 2 ways:

- Scenario Testing -
  The test is undertaken by the operator or manufacturer using a live operational environment. Typically a variety of AMs with varying messages will be put on known numbers and live consumers will be put on other numbers. The dialler will call these numbers as defined within the testing rules and the accuracy of AMD technology will be assessed.

- Laboratory Testing
  The test is undertaken by the dialler manufacturer in laboratory conditions i.e. the AMD technology is used to communicate with known-outcomes within the test facility.

The fundamental weakness with this test type is that it is not testing a real live environment. Whilst the analysis of the test data may accurately reflect real life scenarios, this cannot be guaranteed. Section 5 above outlines all the variables that affect the accuracy of AMD – it is not possible to guarantee that all of these will be covered off by a sample of staged calls regardless of the size of that sample. Indeed it is likely that on a campaign by campaign basis some of this variable will vary significantly and a fixed sample of test calls will not be able to represent them all.

This test methodology becomes more attractive if one assumes that FP rates do not fluctuate significantly due to external factors. At present this argument cannot be made. Furthermore in all conversations we have had with manufacturers and in their literature we have viewed, the argument is made that results will fluctuate based on external factors.

7.3.3 Live Sampling

This is a methodology that has been used by the majority of operators to whom we have spoken. It is based on sampling real AM detected calls and quantifying what the technology has defined as FP rate against the reality or the likely reality.

The following sub methodologies can be used:

- **Trunkside Recording Test**
  Where trunkside recording is available all dials will be recorded. Where an AM has been identified by the AMD this should be recorded on the system. These dials can then be retrieved and sample tested by replaying to identify the rate of FPs.

Human error and a few "unsures" aside, this should give an absolute measure of the FP rate for the sample being tested. If the sampling methodology is accurate enough this should in turn give confidence as to the population of AM calls in its entirety.

The disadvantages of this methodology are technical availability and cost. Most contact centres have agent side recording as this is cheaper (less trunks to record) and, prior to the AMD issue, fulfilled all monitoring requirements. A lot of operations will not be able to install trunkside recording onto their existing systems.

In order to get a clear estimate of the FP rate a large number of AM detects are going to have to be listened to. This is labour intensive and therefore expensive.

- **Agent Validation**
  This methodology involves AMD equipment running in series with agent verification. AMD equipment is used as normal and all positives are passed to an agent rather than being disconnected. The agent can then verify if the AM detected call is valid or is in fact an FP.

  This methodology has the benefit of testing the validity of actual AMD technology decisions, as per the trunkside recording methodology. Hence if sampling is undertaken properly and again, human error aside, an accurate estimation of the FP rate as identified by the agent should be achievable.

  The weakness of the methodology is that the observer (the agent) is interfering in the process they wish to observe and this has the potential to skew the result. As discussed above this a key factor to involve in any testing regime.

  For example – AMD technology might wrongly classify a Consumer as an AM (a FP). In theory this would get spotted under the testing regime when the call is transferred to a live agent. However it is possible that in the period that this call is transferred to an agent (and given contact centre resourcing factors there is likely to be a delay at times) the consumer may hang up. When the agent comes to validate the AM classification all they hear is a deadline which they will be unable to classify.

- **Side By Side Comparison**
  This methodology relies on a statistically robust comparison of 2 scenarios: one where AMD is switched on and one where it is switched off. From the "AMD on" scenario, the AM rate is recorded net of False Negatives. This is then compared to the AM rate recorded in the "AMD off" scenario i.e. the rate defined by agents listening to all calls. The difference will be the FP rate.

The weakness of this methodology is that there is no guarantee that equivalent data is being called and that the AMD control is valid compared to the data dialled in the "AMD on" dataset. This risk can be mitigated by ensuring proper sampling as follows:

- **Datafile** – Records to be called in each group are randomly selected from the same data file.
- **Timing** – Calling is undertaken at exactly the same time.
- **Sample Size** – needs to be large enough to derive a high confidence level.
- **Teams** – Teams are changed regularly to ensure procedures followed are the same.

However uncertainty can only be removed to a limited degree (typically 93% - 95% confidence level) and the risk remains that any flaw in the sampling will skew the result.

7.4 Assessment of Methodologies

The table below summarizes our assessment of each of the testing methodologies.

Table 18 – Testing Methodology Assessment

	Practical Hurdles		Data Considerations			Sampling Considerations		
	Technically Feasible	**Realistic Cost**	**Live Data**	**Relevant Data**	**Operational metrics**	**Actual Event**	**Observer Interference**	**Sampling Validity**
1. Live Call Sampling								
Trunkside	Possible Technology is universally installable, although many/most do not have it currently	Possible For some technology is in situ, for others could be prohibitively expensive	Yes	Yes	Yes	Yes	Yes	Possible If sample undertaken thoroughly
Agent Validation	Yes	Yes Cost is reduced productivity for length of test	Yes	Yes	Yes	Yes	No Unavoidable interference	Possible If sample undertaken thoroughly
Side By Side	Yes	Yes Cost is reduced productivity for length of test	Yes	Yes	Yes	No Testing against a control	Yes	Possible If sample undertaken thoroughly
2. Staged Calling								
Live	Yes	Yes	No	No	Possible If test is undertaken as metrics change	N/A	N/A	N/A
Laboratory	Yes	Yes	No	No	No	N/A	N/A	N/A
3. 100% Analysis								
Agent Listening	Yes	No Any solution will be prohibitively expensive	Ruled out by failure to hit financial hurdle					
Technology	No	N/A	Ruled out by failure to hit technology hurdle					

In summary our research suggests:

- Any 100% review of FPs is impractical from a technology or a cost point of view.
- Staged Calling may not give reliable data for the equipment under test compared to a real environment and we believe cannot be used to opine on a specific campaign. This may be mitigated over time if it can be shown that such test results are consistent between themselves and versus other live campaign test data for the same equipment. We are not aware that such a calibration has been undertaken.
- Sampling appears to be the best practical solution to derive a reasoned estimate. Further considerations are:
    - Where available and not ruled out by cost, objectively sampling and testing trunk side recorded AM calls is the best solution available
    - Side by side testing removes observer interference and is preferred to agent validation so long as a robust sampling methodology is implied
    - Agent validation is not preferred due to the unquantifiable nature of potential observer interference.

- Our preferred ranking of practical test methodologies is:

    6. Trunkside recording testing
    7. Side by Side testing (split testing)
    8. Agent Validation testing
    9. Live call scenario testing
    10. Laboratory calls scenario testing.

7.4 Ofcom Regime

Sections 7.1-3 above have assessed the type of information and methodologies available to operators. This section reviews what considerations will need to be taken into account for Ofcom to assess the validity of a testing regime.

In providing more guidance to operators on what constitutes a reasonable test, Ofcom will have to consider the following factors

7.4.1 Testing methodology

As discussed above Ofcom might consider including a more definitive and detailed list of suitable testing methodologies and possibly rank them by preference. We believe the Guidance provided so far is flawed. Care will need to be taken to ensure any guidance is technology and supplier agnostic.

7.4.2 Testing Accuracy

Linked to the choice of methodology is the wider concept of accuracy. As we have established any acceptable and feasible methodology will rely on sampling and statistical analysis to a greater or lesser extent. This will create a level of uncertainty in any finding (a confidence level) and if the sampling is not done properly may deliver an erroneous result. Ofcom will need to consider what tolerances of error they are willing to allow in the regime. The lesser the tolerance the harder and more expensive it will be to complete the test.

7.4.3 Testing Proactivity

Currently operators are required to produce a substantiated reasoned estimate when investigated by Ofcom.

Alternatively Ofcom could be more proactive in monitoring this area if they believe that systematic abuse is occurring. Options could be, on an increasingly onerous level:

- To require all users of AMD to confirm periodically that they are using the technology to allow for a more focused investigation.
- To require all users of AMD to confirm on a regular basis that they are testing for FPs.
- To require all users of AMD to provide evidence of their testing for FPs on a regular basis in line with an agreed testing regime.
- To require all users of AMD to report their tested FP rates on a regular basis in line with an agreed testing regime.

7.4.4 Regularity of Testing

There is currently confusion as to how often testing should occur. Given the variables affecting the FP rate we do not believe that, until proven otherwise, one test is enough to give a reliable estimate across different campaigns and indeed across one campaign if certain variables change.

We suspect that the same solution will deliver similar FP rates across campaigns. If this can be established then it may well be the case that a FP rate can be relied upon on a wider basis than campaign by campaign i.e. on a solution basis (or solution and settings basis). This would reduce the requirement for ongoing testing. However in the absence of empirical data this cannot at present be assumed. It may well be the case that manufacturers could lead the way in establishing this empirical evidence (see section 5 above).

Ofcom may wish to proscribe or give guidance on the regularity and arrangement of tests to be completed. Factors to be considered would include:

- Proof required to indicate consistency of FP rates across campaigns,
- Re- testing when a campaign materially changes,
- Definition of campaign in this context,
- Testing spread across calling window and different campaign data,
- Level of consistency required before a general FP rate might be assumed.

7.4.5 Objectivity

It is clearly preferable to have testing undertaken by an objective third party. Ofcom may wish to consider making this mandatory or stating their preference for it. This could be done in the form of a preferred list of testing organisations or a requirement that the test be independently signed off before being accepted.

7.5.6 Two second Rule

As discussed above Ofcom also need to address the issue of the Two Second Rule.

7.5.7 FPR to FPC

As discussed in section 6 above, the False Positive Rate on its own is of little consequence. It needs to be turned into a False Positive Contribution to Abandoned Rate. Ofcom might want to provide guidance on how this is to calculated. More work will be required in this area.

8 Comment on the likely efficiencies or productivity gains that can be attributed to the use of AMD in call centres.

8.1 Operational Productivity

8.1.1. Overview

The analysis of contact centre performance is not an easy subject. In the simplest analysis it is the aim of contact centres to maximise the amount of time agents are talking to Consumers (operational productivity). All other things being equal this will allow more conversations to be had and more positive outcomes (e.g. collection or sale) to be achieved. Layered on top of this base metric is the quality of conversations those agents are having and the business outcomes they drive. There is some debate in some quarters as to the relationship between these two definitions. In this section we consider both, starting with operational productivity.

The most widely used unit of measurement for productivity is talk time per hour i.e. the percentage or minutes an agent is on average able to be on a live call in an hour when that agent is available for work (i.e. excluding holiday, sick, lunch etc). We have based our analysis on this unit.

How increased productivity is achieved crosses the whole spectrum of operational management from recruitment, training, management procedures to data analysis and of course, technology.

8.1.2. Dialler Technology

We have briefly outlined the types of dialler available and the productivity benefits that can be ascribed to their use in section 5.1.1 above. It is not within the scope of this report to provide a detailed review of dialler use and benefits. But in short, the attraction of diallers is that they remove from the agent non productive tasks and allow the agent to spend more time on Live Calls.

On average a well run dialler on a campaign of sufficient size may deliver the following increase in talk time:

Table 19 Dialler Productivity Gains

Dialler Type	Talk Time percentage	Talk Time (Minutes)
Manual	30%	18
Preview	35%-45%	21-27
Power	45%-55%	27-33
Predictive	75%-80%	45-48

Removing from the agent the need to find a record, dial it and wait for an answer greatly increases the time that agent can be talking to Consumers.

The effectiveness of predictive dialling is also subject to the volume of Abandoned Calls that are allowed. If more Abandoned Calls are allowed the dialler can increase productivity by ensuring a call is available for an agent with the inevitable downside of getting it wrong, over dialling and having a Consumer on the line with no agent to talk to (an Abandoned Call). N.B. The figures quoted above factor in a 3% Abandoned Rate per the Revised Guidelines.

8.1.3 AMD Effect on Productivity

AMD equipment has been attractive to outbound campaigns because it aims to increase the productivity of agents. Generally it is the aim of outbound campaigns to speak to live Consumers rather than leave a message on an answer machine.

Typically if an agent handles an AM answered call they will listen to the first part of the message to verify it is an AM and then disconnect. Having agents handle calls that are answered by an AM is therefore wasted time for that agent and reduces the operational productivity of the operation as a whole. More agents will be required to deliver the same number of live contacts.

AMD equipment delivers increased productivity by eliminating AM calls from the agent queues and saves the agent the time of verifying and disconnecting. It also saves the time of the wait for that call to have been delivered.

We have received various estimates of the benefit that AMD technology can deliver. The benefit moves with the ratio of AM calls to total calls. An average indication of the increase in live talk time delivered by efficient AMD equipment on a campaign of sufficient size working to a 3% Abandoned Call Rate is as follows:

Table 20 Talk Time as Function of AMR

	Answer Machine Rate			
	20%	30%	40%	50%
Live Talk Time AMD On (1)	75%	75%	74%	73%
Live Talk Time AMD Off	73%	71%	68%	60%
Variance (%age)	2%	4%	6%	13%
Variance (Minutes)	1 min	2min	4min	8min

(1) – There is a small drop off in productivity rates even with AMD on as AM rate increases.

All other things being equal (see below) this percentage increase in productivity can be more or less assumed to be transferred into an equal performance increase or equal and opposite cost saving for the same performance level.

Compliant organisations need to factor their FP rate into the 3% allowed for Abandoned Calls. This inevitably means they have less of a tolerance for normal Abandoned Calls generated by over-dialling. For instance a centre assuming 1.5% FPC will be able to allow only 1.5% Abandoned Calls rather than 3% and this will reduce the productivity the dialler can deliver. The general consensus is the reduction in over-dialling does not outweigh the benefits of AMD *in most scenarios* but it does clearly reduce the benefit to some extent.

8.2 Wider Performance Factors

8.2.1 Overview

A more sophisticated way of considering outbound contact centre performance is to look at outcomes. Whilst agent productivity is the most direct form of performance analysis it does not tell the whole picture. Ultimately what is of interest to an organisation is the business outcomes its contact centre produces - for a sales operation this will be based around number of sales attained, for a collections business it will be based on value collected.

This wider performance analysis metric is influenced by operational productivity but it is a function of other operational considerations as well, such as quality of the conversation and skill of the operator. It is also a function of wider factors beyond the control of the operation (e.g. quality of data, wider PR events, macroeconomic factors etc) and as such is harder to tie directly to contact centre performance compared to the more directly focused operational productivity metrics.

In this section we consider the effect of AMD on this wider performance measure and, given their differing nature, we have split the analysis of sales and collections operations.

8.2.2 Sales

With respect to sales operations we have been provided with the following arguments:

Table 21 Pros and Cons of AMD - Sales

AMD as a Benefit to Sales Performance	
Operational productivity	▪ As discussed in section 8.1 above AMD allows agents to be talking longer to Consumers, this provides them with a greater window in which to be selling
Agent Enthusiasm	▪ Repeatedly listening to an AM and disconnecting, sometimes many times over before reaching a live Consumer, can blunt the sales preparedness of an agent. AMD removes some/all of these calls allowing the agent to stay prepared knowing that all/most calls will be an opportunity to sell.
AMD as a Detriment to Sales Performance	
Agent Preparedness	Conventional AMD requires a pause at the start of the telephone connection to allow for the analysis to occur. It is argued that this pause starts any sales conversation on the wrong foot - in many instances the agent is unsure if a

	consumer is present as their salutation will be over and this stilted start reduces sales conversion rates.
Hang Ups	The pause at the start of the call allows savvy Consumers to identify the call as a contact centre and hang up before a conversation even begins.
Consumer Identification	Even if the Consumer does not hang up, they may be annoyed by having to wait for someone who has called them to come on the line and may be "on their guard" knowing it is a contact centre calling. This attitudinal change may reduce the likelihood of a sale

These latter effects have convinced some sales operations that they are better off without AMD and have been happy to disconnect. Hard evidence is difficult to come by but we have spoken to a number of contact centres who have recently switched off AMD and have seen sales performance increases that outweigh the reduction in productivity.

On the other hand we have spoken to a number of operators who have seen no increase in sales performance and have suffered with AMD off due to the productivity decline. It is safe to say the industry is split on this point.

It is also worth noting that some of the reasons given to us for increased performance when AMD was switched off have no direct link to AMD itself. For instance one operator claims post AMD their conversion rates per hour increased. On closer analysis it became apparent that the reason for this was down to changes to operational procedures that had been considered as a result of switching off AMD (and a fear of a resulting drop in performance), but not directly related to it e.g. shortening the time of disconnect to be post 15 seconds BUT within the standard pick up times for 1571 and network answer systems. Clearly this change could have been implemented with or without AMD on.

8.2.2 Collections

With respect to collections operations the argument appears to be much clearer cut, with the downside of AMD turn-off much more accepted. Again we have been provided with the following arguments:

Table 22 Pros and Cons of AMD -Collections

AMD as a Benefit to Collections Performance	
Operational productivity	▪ As discussed in section 8.1 above AMD allows agents to be talking longer to Consumers, this provides them with a greater window in which to be selling
Agent Disillusionment	▪ Repeatedly listening to an AM and disconnecting, sometimes many times over before reaching a live Consumer, can blunt the sales preparedness of an agent. AMD removes some/all of these calls allowing the agent to stay prepared knowing that all/most calls will be an opportunity to sell
AMD as a Detriment to Collections Performance	
Leaving Messages	▪ For some collections businesses leaving a message on an answer machine is an acceptable call outcome. This drives inbound activity (the best collections channel) and was often explained to us as being better than not talking to the Consumer at all.
Agent Preparedness	▪ As explained above for Sales operations. This factor was stated as being present, but its importance for collections businesses is less. The subject matter of a collections call and Consumer reaction to it is less likely to be effected by the opening of the conversation; the agent is relying much less on the goodwill of the consumer
Hang Ups	▪ The pause at the start of the call allows savvy Consumers to identify it is a contact centre and hang up before a conversation can be had. ▪ Conversely this has less effect than for sales operations as Collections businesses do leave messages more often.
Consumer Identification	▪ Even if the Consumer does not hang up they may be annoyed by having to wait for someone who has called them to come on the line and may be "on their guard" knowing it is a contact centre calling. This attitudinal change may reduce the likelihood of a sale. ▪ Again less of a factor for a collections business where the subject matter means that Consumer attitude is of less relevance.

We did not interview one collections business who believed that switching AMD off had positively impacted their business and many who claimed significant detriment (upto a 33% increase in costbase).

8.3. Conclusion

The use of AMD technology does increase agent productivity. This varies depending on the ratio of AM Calls to Live Calls, the over dial setting of the dialler and the sensitivity setting of the AMD equipment. Typical values we were given were 5%-10% (3-6 minute) increase in talk time per hour and this is borne out by our findings from our tests.

It is clear therefore that removing AMD has a negative impact on the most direct measure of contact centre productivity.

However when wider business performance is considered, the picture becomes less clear.

Switching AMD off appears to give some sales operations an increase sales performance for the Live Calls undertaken. Some operators are convinced this outweighs the loss of productivity and we are persuaded by their findings for their individual circumstances. Whether this can be extended to a more general conclusion remains to be seen.

We are not convinced that a similar case has been, or indeed can be made, for collections businesses. Nothing we have seen suggests that switching off AMD can benefit the performance of a collections business.

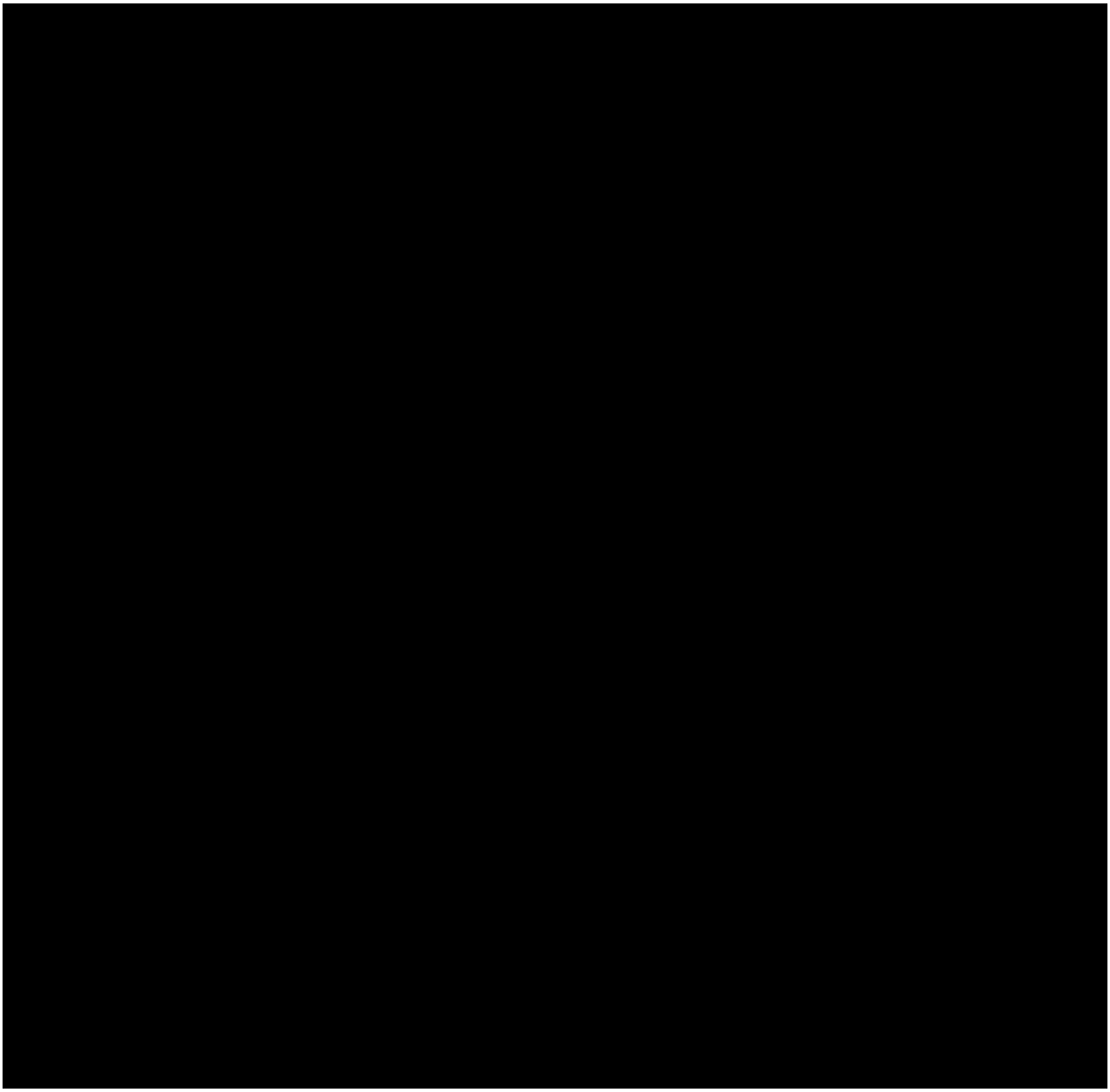
APPENDIX 1 – Glossary

Also please note Call Type definitions are included in Section 4.

Term	Description
Agent	Person working in contact centre making outbound calls.
Agent Side Recording	The process that records calls once an agent is made live on the call – as opposed to Trunk Side Recording.
AM	Answer Machine – utilised by a Consumer to answer calls made to them. They may be analogue or digital and home or network based.
AM rate	The ratio of AM calls to Live Calls in a campaign.
AMD	Answer Machine Detection – use of technology to identify outbound calls that are answered by an Answer Machine (see section 5.1.).
AMD rates	The ratio of AM calls being defined as such by AMD equipment
Abandoned Call	A call made where a connection is made with a live individual and then terminated.
Consumer	Person to which calls are made – for simplicity we have used this term in all campaign scenarios relevant to the Guidelines where strictly speaking it may not be the correct term.
DMC	Decision Maker Contact – The number of decision makers reached. A decision maker will be defined per campaign and might be, for example, the policyholder or the householder.
False Positive Contribution to Abandon rate ("FPC"	Addition to overall Abandon Rate made by False Positives i.e. once Am rates and AMD Rates are factored in.
Dialler	Equipment used in a contact centre to make outbound calls (see section 4.1)
Dials Made	Total number of dial attempts made in a given operational situation.
Early Detection	AMD technology used to identify AMs during the connection period or at point of divert.
Fifteen Second Rule	4.16.3 of the Revised Guidelines – all calls must ring for a minimum of 15 seconds before disconnection by the contact centre
FN	False Negatives – A call where a connection is made to an AM that AMD equipment has incorrectly identified as being a live Consumer
FP	False Positives – A call where a connection is made with a live individual and then terminated because technology wrongly identifies the counterparty as an AM.
FPR	False Positive Rate –percentage of calls identified as Answer Machines by AMD technology that are in fact live answered.
Live ratio	The ratio of live consumer answered calls to total dialled calls.

Term	Description
Operator	Used as generic term for operator of outbound call centres – whether inhouse or outsourced.
Original Statement	Statement of policy on the persistent misuse of an electronic communications network or service (Mar 2006)
Over-dialling	An effect produced by predictive diallers. Overdialling is the process by which diallers call more numbers than they have agents available on the assumption that some calls will not be answered, agents will become available during the ringing period etc. Overdialling leads directly to Abandoned Calls when the equipment gets it wrong and too many calls are made.
Revised Statement	Revised statement of policy on the persistent misuse of an electronic communications network or service (Sep 2008)
RPC	Right Party Contact. This denotes that the call has been made and the advisor has spoken to the named individual from the calling list.
Silent Call	A type of Abandoned Call where the called party hears nothing on the line and has no way of determining whether anyone is there.
Standard Detection	AMD technology that analyses a call immediately post pickup.
The 2 second guideline	Guideline in the Revised Statement of Policy (Sep 08) clause 4.16.2 stating that Abandoned Calls should play a message with company details within 2 seconds of consumer end pickup.
The 3 percent Guideline	Guideline in the Revised Statement of Policy (Sep 08) clause 4.16.1 stating that Abandoned Calls should be no more than3% of Live Calls by campaign and should include a reasoned estimate of FPs..
Trunk-side recording	The process of recording all connected dials - this would include the recording of FPs – as opposed to Agent Side Recording.
VC	Verint Consulting
VOIP	Voice Over Internet protocol e.g. Skype.

APPENDIX 2 - Test site results, site by site.



APPENDIX 3 – Compliance Analysis

The tables below show a series of modelled FPR scenarios as summarised in section 6 above.

The variables that effect the transformation of FP Rate to Contribution to Abandoned Rate ("FPC") is as follows:

- Dials Made ("DM") — The number of dial attempts made.
- AM Ratio ("AMR") — The percentage of records that are answered by an Answer Machine (Am calls).[1]
- Live Ratio ("LR") — The percentage of records that are answered by a live Consumer.
- MD Rate ("AMDR") — The percentage of AM calls detected by AMD equipment (including FPs).

The opposite of this percentage is False Negatives i.e. AM calls passed on to live agents. (NB this is the rate has been reduced for many operations by the introduction of the 2 Second rule.)

The tables below vary these factors and indicate how they interrelate to each other and show the effect on compliancy to The Three Percent Rule.

[1] It is worth noting that whilst in reality live rate and AM rates may move equally and oppositely this is not definite as there is a balancing figure of non connects. As a result the two variables must be included.

Varying Live and AM Ratios

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

AM Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.35%	0.70%	1.38%	1.72%	3.38%	4.99%
Percentage change from base	-49.8%	-49.7%	-49.3%	-49.1%	-48.3%	-47.5%

Live Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	1.38%	2.72%	5.30%	6.54%	12.28%	17.36%
Percentage change from base	98.6%	97.3%	94.7%	93.5%	87.7%	82.6%

Live Rate and AM Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	60%	60%	60%	60%	60%	60%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%
Percentage change from base	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

AM Rate Increased

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	60%	60%	60%	60%	60%	60%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	0%	0%	0%	0%	0%	0%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	1.04%	2.06%	4.03%	4.99%	9.50%	13.61%
Percentage change from base	49.5%	49.0%	48.0%	47.5%	45.2%	43.2%

Live Rate Increased

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	60%	60%	60%	60%	60%	60%
Non connect	0%	0%	0%	0%	0%	0%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.46%	0.92%	1.83%	2.28%	4.46%	6.54%
Percentage change from base	-33.2%	-33.0%	-32.7%	-32.6%	-31.8%	-31.2%

Live Rate Reduced/ AM rate increased

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	60%	60%	60%	60%	60%	60%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	2.06%	4.03%	7.75%	9.50%	17.36%	23.95%
Percentage change from base	195.9%	191.9%	184.5%	181.0%	165.3%	152.1%

Varying AMD Rate

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

AMD Rate Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	35%	35%	35%	35%	35%	35%
FP Contribution to abandon rate	0.35%	0.70%	1.38%	1.72%	3.38%	4.99%
Percentage change from base	-49.8%	-49.7%	-49.3%	-49.1%	-48.3%	-47.5%

AMD Rate Significantly Reduced

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	5%	5%	5%	5%	5%	5%
FP Contribution to abandon rate	0.05%	0.10%	0.20%	0.25%	0.50%	0.74%
Percentage change from base	-92.8%	-92.8%	-92.7%	-92.6%	-92.4%	-92.2%

AMD Rate 100%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	100%	100%	100%	100%	100%	100%
FP Contribution to abandon rate	0.99%	1.96%	3.85%	4.76%	9.09%	13.04%
Percentage change from base	42.4%	42.0%	41.2%	40.8%	39.0%	37.3%

Varying AMD Rate with reduced Live Rate

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

AMD Rate 100%, Live rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	100%	100%	100%	100%	100%	100%
FP Contribution to abandon rate	1.96%	3.85%	7.41%	9.09%	16.67%	23.08%
Percentage change from base	182.1%	178.6%	172.0%	168.8%	154.8%	142.9%

AMD Rate 5%, Live rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	5%	5%	5%	5%	5%	5%
FP Contribution to abandon rate	0.10%	0.20%	0.40%	0.50%	0.99%	1.48%
Percentage change from base	-85.6%	-85.5%	-85.4%	-85.3%	-84.9%	-84.4%

AMD Rate 35%, Live rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	20%	20%	20%	20%	20%	20%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	35%	35%	35%	35%	35%	35%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%
Percentage change from base	0.0%	0.0%	0.0%	0.0%	0.0%	0.0%

Varying AMD Rate with reduced AM Rate

Base

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	40%	40%	40%	40%	40%	40%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	20%	20%	20%	20%	20%	20%
AMD rate	70%	70%	70%	70%	70%	70%
FP Contribution to abandon rate	0.70%	1.38%	2.72%	3.38%	6.54%	9.50%

AMD Rate 100%, AM Rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	100%	100%	100%	100%	100%	100%
FP Contribution to abandon rate	0.50%	0.99%	1.96%	2.44%	4.76%	6.98%
Percentage change from base	-28.4%	-28.3%	-28.0%	-27.9%	-27.2%	-26.6%

AMD Rate 5%, AM Rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	5%	5%	5%	5%	5%	5%
FP Contribution to abandon rate	0.02%	0.05%	0.10%	0.12%	0.25%	0.37%
Percentage change from base	-96.4%	-96.4%	-96.3%	-96.3%	-96.2%	-96.1%

AMD Rate 35%, AM Rate 20%

False positive rate	1%	2%	4%	5%	10%	15%
Total Calls	10000	10000	10000	10000	10000	10000
AM rate	20%	20%	20%	20%	20%	20%
Live Rate	40%	40%	40%	40%	40%	40%
Non connect	40%	40%	40%	40%	40%	40%
AMD rate	35%	35%	35%	35%	35%	35%
FP Contribution to abandon rate	0.17%	0.35%	0.70%	0.87%	1.72%	2.56%
Percentage change from base	-74.9%	-74.7%	-74.5%	-74.3%	-73.7%	-73.1%