Recommendations for a Reasonable Call Handling Fee (CHF) associated with the Emergency Call Answering Services (ECAS)

Non-confidential report

ComReg

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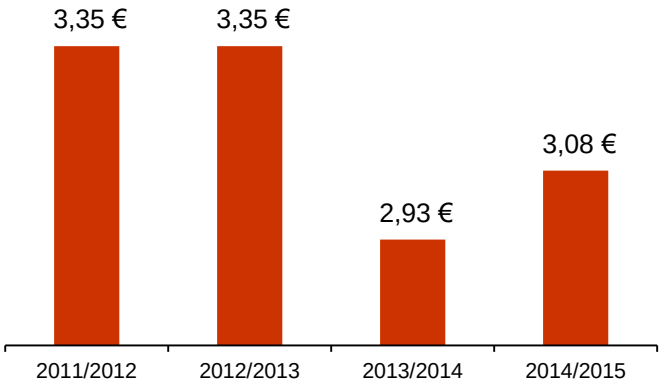
Summary

0 Executive summary

The Department of Communications, Energy and Natural Resources (DCENR), selected BT Ireland in 2008 as the provider of Emergency Call Answering Service ("ECAS") in Ireland for a period of 5 years. The service by BT started in July 2010. In order to recover the cost of running the ECAS operation, BT Ireland charges a Call Handling Fee ("CHF") to operators for emergency calls which originate on their networks.

Section 58D of the 2007 Act requires ComReg to review the CHF and to ensure that the CHF enables BT to recover its costs that are deemed reasonable for the ECAS operation. As such, every year since 2010, ComReg analyses the operation and expense by ECAS and evaluates the level CHF required for BT to recoup its reasonable costs. Figure 1 below illustrates the changes in the level of CHF determined after each review since the beginning of the ECAS operation by BT.

Figure 1 – CHF levels since the beginning of the ECAS operation by BT



Source: ComReg, TERA Consultants analysis

The CHF has been adjusted each year based on the review of costs incurred during the year prior to each review and the newly calculated CHF takes effect on 12 February the following year. The CHF is indeed set to ensure that BT recovers its costs and any under or over-recovery over the period of the contract, which includes past and future years.

Due to the accelerated reduction in call volumes in recent months, the associated revenues have decreased significantly and have not matched the level of total costs incurred by the ECAS operations. BT has therefore been under-recovering and, given that the CHF is fixed at €3.08 until February 2015, will very likely to continue to under-recover until then. The new CHF therefore needs to be

adjusted in order to take into account the under-recovery as well as the new rate of call volume decline for the rest of the Concession Agreement.

This review has been conducted, as with last year's review, with the requirement to assess what costs have been incurred and if they are deemed to be reasonable.

In order to verify that BT's ECAS costs during last year's operations are reasonable and to determine the level of the CHF that will take effect on 12 February 2015, it is necessary to thoroughly understand the types of costs incurred by BT for the provision of ECAS, in order to compare them with available best practices and to assess how they will evolve. Based on the previous and current reviews, BT's cost base, excluding the under-recovery, has remained relatively the same and even declining. BT's ECAS cost base consists of:

- Operator costs: BT pays a fixed charge per hour worked by Operators to its sub-contractor,
- BT pay costs: for the management of ECAS operation,
- BT non pay costs: which include accommodation costs, facilities management, maintenance of fixed assets, network services, etc.,
- Depreciation charges: for fixed assets and set-up costs.
- Financial costs: which include costs for the Guaranteed Rate of Return, the Section 58D fund (or the Sinking Fund) and past under-recovered costs.

This year, the review gives a particular focus on BT's request of an additional expense for an IT upgrade that was found to be necessary by TERA Consultants and Orbita and was approved by ComReg.

Otherwise, the costs allowed from this year's review do not deviate significantly from what BT submitted, since BT has kept to their committed level of reasonable costs following previous reviews.

It should also be recognised that the efficiency of ECAS operation has considerably been consistent. The call centre operational review reveals that ECAS is run effectively against the service targets and quality requirements and overall is approaching 'leading practice' from a performance perspective.

Nevertheless, some observations on possible improvement to the ECAS operations have been made and listed below:

- Operator satisfaction can be affected by periods of inactivity when contact centre capacity far exceeds actual demand. This is attenuated by the diligence and attentiveness of the workforce.

- Recent, high staff turnover rates, equating to an annual rate of over 60%, fall substantially short of 'leading or good practice' and would at best be classified as 'adequate'. It can be a sign of an underlying issue with the working conditions such as no pay rises in the last 3 years and coincides with the fact that alternative job opportunities for call operators have arisen recently elsewhere.

- FLMs and Service Coordinators are good practitioners, but the joint roles in operational aspects of team management is not 'leading practice' from a purist contact centre perspective

- Operational management would be enhanced by more frequent historic Management Information (MI) presented in the required format in order to remove the need for manual manipulation

Between January 2014 and September 2014, there have been fewer calls to the emergency services than expected, mainly through a reduction in the number of '112 Silent' and 'Cleared without Speech' calls (e.g. inadvertent dialling of mobile phones) which in turn can be said to be associated with the increase in the use of smartphones. In particular, the period between January and September 2014 represents an annual decline of around 19% compared to the same period in 2013. The decrease rate of call volumes has proved therefore to be higher than forecasted in last year's review. TERA Consultants has adjusted the forecasts for the following years accordingly, -15.2% per annum instead of -3%.

Considering these main changes, a specific calculation is carried out to set a CHF value that enables BT to recover its costs for the provision of ECAS over the full contract period (including interests and past under/over recoveries). Using this approach, and considering the reasonable costs identified in this report, **TERA Consultants proposes a CHF of €4.63 per call to be applied from February 2015 to February 2016. This rate would apply until the end of the Concession Agreement if call volumes and costs do not change materially from those forecasts to the end of the contract.**

It is important to note that the calculated level of CHF enables the ECAS provider to recover its costs, and that the total costs of the ECAS operations have been slightly declining despite a significant amount of fixed costs and is forecasted to decline further towards the end of the Concession Agreement. Therefore, even though the level of CHF will increase, the total financial contributions from the electronic communications operators over the lifetime of the Concession Agreement follow this pattern, excluding compensation for BT's under-recovery. Any fluctuations in operators' financial contributions only reflect the over or under-recovery of the previous period.

1 Introduction

The Emergency Call Answering Service ("ECAS") receives all emergency calls (999/112) that are made in Ireland. The ECAS centres are responsible for forwarding every genuine call to the responsible emergency service, as quickly and effectively as possible.

All emergency calls are free of charge to the caller as required by European Union legislation. In Ireland, ECAS is funded through the Call Handling Fee ("CHF") payable by telephone network operators present in the country and/or the telephone call service provider. In order to recover the cost of running the ECAS operation, the provider of emergency call answering services charges the CHF to operators for calls which originate on their network.

In 2008, the Department of Communications, Energy and Natural Resources (DCENR) chose BT Ireland through a public procurement process to provide emergency call answering services on behalf of the state of Ireland. The Concession Agreement was initially planning that BT Ireland would operate the service until mid-2015 but it was extended for at least one year.

BT has since developed and made fully functional three ECAS centres, in Navan in Co. Meath, Ballyshannon in Co. Donegal, and EastPoint in Dublin 3. These centres are also known as Public Safety Answering Points ("PSAP").

Under Section 58D of the Communications Regulation (Amendment) Act 2007, each year, ComReg is required to review the maximum CHF that may be charged. ComReg may confirm the existing maximum CHF or, following consultation with the ECAS provider, ComReg may raise or lower the existing maximum CHF. Section 58D states that, when reviewing the CHF ComReg "*shall have regard to – the need for the ECAS operator to cover the reasonable costs likely to be incurred by it in operating the service*." ComReg has clarified the meaning of "reasonable costs" and stated that "*in assessing whether costs are reasonable, ComReg will have regard to similar operations in other countries and international best practice. Incurred costs which are clearly unnecessary, excessive or avoidable may not be deemed reasonable, and may have an impact on the 'Call Handling Fee' for the period following any review".* ComReg already reviewed several times the CHF. The last review occurred in 2013: the CHF for the ECAS operations between February 2014 and February 2015 is currently set at €3.08 per call.

This year, ComReg has appointed TERA Consultants to conduct a review of the current CHF. The present study focuses mainly on:

- The review of ECAS operations;
- The review of the usual costs incurred by ECAS operations and the CHF;
- The review of BT's request for additional CAPEX expense for a critical IT upgrade;
- The review of KPIs currently undertaken by BT and recommendations for improvement of the service target and quality measurement system.

Since last year's review, call volumes have declined more than expected, reaching around -26.1% in July 2014 compared to July 2013. This has an important implication on the revenues recovered by BT through the calculated CHF for 2014/2015. Therefore, this year's review also investigates why a decline has taken place in order to give a confident forecast of call volumes for the upcoming periods.

Following this review and if deemed necessary by ComReg, the CHF can be adjusted with the adjustment taking effect on 12 February 2015 for the following 12 months.

For the review of the usual costs incurred by ECAS operations, the approach followed by TERA Consultants consists of assessing whether past costs incurred were reasonable and to understand the cost drivers in order to produce forecasts. For the review of BT's request for an IT upgrade and KPIs, Orbita Consultancy has been involved in the project. Orbita's consultants have considerable expertise in reviewing and operating call handling centres and rostering operators and reviewing and developing call forecasts and capacity plans; having done this extensively for emergency call handling centres (such as Yorkshire Ambulance Service, North West Ambulance Service, NHS Direct, Strathclyde Constabulary, Cambridgeshire Constabulary, etc.). PSAP site visits to East Point and Navan were made by Orbita consultants on 9th, 10th and 11th September 2014 and included:

- Discussions with ComReg;
- Presentations and meetings with ECAS representatives from BT and Conduit. Attendees included Head of operations, First Line Managers (FLM), Service Co-ordinators, Scheduling and Planning Managers, Technical Architects / Managers;

- Side by side listening to live 999 / 112 emergency calls;
- Observation of a PSAP operator briefing session.

An important amount of data was gathered for the reviews and can be classified in the following categories:

- Volumetric:
    - Historical and forecast call volumes by type and categorisation;
    - Service performance;
- Staffing and activity:
    - Organisational structure;
    - 'Not ready' code data and other off phone activities;
    - Sickness and other absences;
    - Attrition and recruitment;
- Commercial:
    - Contract and schedules;
    - Service levels and volumes;
- Workforce planning:
    - Forecasts and forecast performance;
    - Forecast models and capacity plan;
    - Schedules and schedule metrics;
    - Shrinkages and allowances;
- Management information:
    - Reporting suites and OLA for production;
- Relationship and service management:
    - Processes;
    - Incidents, activities and improvements;

- Costs incurred by BT:
    - CAPEX and OPEX;
    - Fixed costs and variable costs.

The analysis used specific techniques designed by Orbita, industry knowledge and benchmarking data. Special attention was also dedicated to the workforce management review due to the particular characteristics of ECAS operations. Accounting information was also provided by BT.

All this enables TERA Consultants to establish a recommendation to ComReg for the CHF from 12 February 2015 to 11 February 2016 for this year's review.

The rest of the report is structured as following:

- An operational review of ECAS call centres (see section 2);
- The number of calls to ECAS (see section 3); and
- The various costs incurred through the ECAS provision and the recommendation of the CHF for the period between February 2015 and February 2016 (see section 4).

In general, these three parts can be read independently, bearing in mind that the analyses in sections 2 and 3 also have an impact on the level of CHF (section 4).

2 PSAP operational review and findings

A refresh of the findings of the 2012 operational review[1] was carried out by Orbita in order to assess whether the centres were still being run effectively. Information was collected during visits to the contact centres at East Point and Navan on 9th, 10th and 11th September 2014.

A full review of the operation was not deemed necessary given the continuing stability in the operations activity and procedures. Key findings from the 2012 and 2013 review were confirmed during the visit and the assertion made that there is no material change in the methodology and performance of the centres. Therefore the conclusions drawn during the 2012/13 reviews are still applicable. These are summarised below.

ECAS still remains predominantly a call handling service. However, a number of initiatives are underway to investigate and introduce alternative media / channels, e.g. text messaging services to meet some diversity requirements. Therefore, our terminology of 'contact centres' includes telephony and other media.

2.1 Organisational structure

The ECAS operation is delivered by three contact centres at Eastpoint, Navan and Ballyshannon.

BT is responsible for service performance. Its ECAS core management team consists of

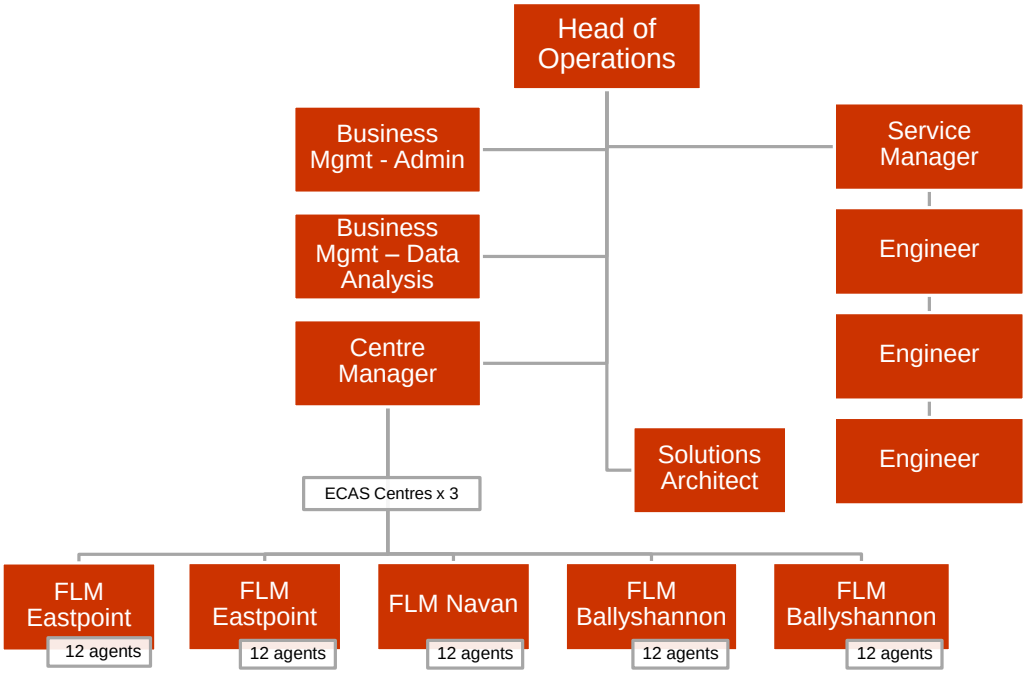
- A Head of Operations[2];
- Two Business Administrators;
- A Centre Manager;

[1] See TERA Consultants/Orbita consultancy, "Recommendations for a Reasonable Call Handling Fee (CHF) associated with the Emergency Call Answering Services (ECAS) - Final non-confidential report", 19 October 2012 (http://www.comreg.ie/_fileupload/publications/ComReg12112a.pdf)

[2] Since April 2014, the Head of ECAS Operations started working 80% FTE and a new position of a Centre Manager was created to manage the day to day operations of the ECAS Operator Centres. A Centre Manager, previously an FLM, was appointed, reducing the FLM team from six to five and leaving the overall headcount at management level unchanged.

- A Solutions Architect;
- A Service Manager;
- Three Engineers; and
- 5 First Line Managers (FLMs).

Figure 2 - Organisational chart of BT ECAS Management team



Source: BT

Each FLM is responsible for a dedicated centre. FLM rotas are organised so as to provide coordinated FLM cover within and across the three contact centres. The two Administrators from BT are based in Navan.

BT employs a third party contractor, Conduit, to provide the necessary contact handling capacity as identified by BT for each period of the day. Conduit in turn employs approximately ✂ staff who constitute the contact handlers (Operators) across the three sites. Conduit manages its Operator resource by providing a Service Coordinator at each site.

Roles and responsibilities are split as follows:

- Conduit's Service Coordinators manage core Human Resources (HR) aspects: recruitment, training for call handling, exit interviews, holiday bookings, absence, shift issues;

- BT's FLMs look after operational performance management: training, coaching, quality, contact handling service levels, team meetings, one-2-ones;

- Suitable Operators become Lead Operators who, periodically and when required, take on key aspects of the FLM role when the on duty FLM has to attend to other work commitments.

2.2 Observations and findings

By reference to our leading industry practice guidelines and where possible, findings have been graded as follows: exhibits / is consistent with 'leading practice', indicates 'good practice', is just 'adequate practice', falls short and is 'poor practice'. Our assessments did not fall completely into any categories of 'adequate' or 'poor practice'.

2.2.1 Team management

- The ratio of one FLM to 12 Operators is appropriate in the ECAS environment and consistent with 'leading practice'.

- FLMs have clearly defined roles and responsibilities, and demonstrate a good understanding of them. They described their day-to-day activities and interactions with their teams in a way that indicates 'good practice' in so far as their role allows.

- As FLMs share individual and team management with Service Coordinators, their role is not complete when compared with contact centre 'leading practice'.

- Our impression was that FLMs and Service Coordinators do work closely together to aim for a seamless management regime.

2.2.2 Lead Operators

- Most if not all Operators with sufficient tenure do become Lead Operators. FLMs assign the Lead Operator role carefully in order to share the associated salary uplift among those who are eligible.

2.2.3 Training, coaching and feedback

- Conduit delivers induction courses and training on fundamental call handling. Conduit supplies ECAS training for new recruits whereas BT is responsible for ongoing refresher training.

- FLMs monitor at least 10 calls per week per team member, and are required to provide weekly feedback. The feedback may only take a few minutes when the Operator's service and quality requirements are met.

- FLMs also provide quarterly feedback to each of their team members. Quarterly feedback sessions last approximately 30 min.

- Training, coaching and feedback sessions are not scheduled because flexibility can be compromised. Instead, these sessions are done when there is surplus capacity; and FLMs liaise to ensure all are aware when Operators are taken off the phone for these purposes.

- The time allocated to training as an initial duration and subsequently through shrinkage needs checking against what is fit for purpose and what actually happens.

2.2.4 Resource planning

- In our 2011 and 2012 review, a perceived arbitrary allocation of additional resource during the workforce planning process was highlighted. While the creditable motives can be acknowledged, it was recommended that BT should adopt a more scientific approach. Following this year's review, some changes in line with the recommendations have been undertaken. However, there are still routine practices to ensure a surplus of Operators, which can be linked to BT contractual obligations under the Concession Agreement.

- In other, non-emergency, customer service environments, this would be 'poor practice' because of the additional costs and the impact on reducing Operator workload and employee satisfaction. However, given the critical nature of ECAS, the current approach can be categorised as 'adequate practice'.

- It is the approach to capacity planning that gets this grading; not the intentions to ensure adequate capacity in all circumstances.

2.2.5 Historic Management Information (MI)

- FLMs have weekly historic MI. Information may be transferred manually into spreadsheets for individual use. The periodicity and manual involvement is not consistent with 'best practice', and our grading for an MI set-up of this type would be 'adequate' to 'good practice'. However, day-to-day operational management, resource levels and team interactions appear to be ensuring adherence to service targets and quality requirements.

2.2.6 Staff turnover

- Operator attrition was discussed. Operators were said to be in two groups (split 50:50 in terms of overall Operator population): a stable group with little or no change and a more transient set, where churn is high.

- From information supplied by BT and Conduit, from Sept-13 to Aug-14 monthly attrition averaged 4.8%. For the year this equates to a >60% turnover of total staff numbers.

- This is above contact centre industry averages and is often an indicator of a potential underlying issue, such as rates of pay, job satisfaction, etc. BT has already brought to ComReg's attention the fact that there are more alternative contact centre work opportunities and has initiated the approvals process for a recommended pay rise for Operators (see section 4.1.1.1).

2.2.7 Conclusions

On the basis of visits to Navan and East Point and on information supplied during meetings and by BT and Conduit, it was concluded that:

- ECAS is run effectively against the service targets and quality requirements and overall is approaching 'leading practice' from a performance perspective;

- FLMs and Service Coordinators are good practitioners, but the joint roles in operational aspects of team management is not 'leading practice' from a purist contact centre perspective.

- Operator satisfaction can be affected by periods of inactivity when contact centre capacity far exceeds actual demand. This is attenuated by the diligence and attentiveness of the workforce.

- Operational management would be enhanced by more frequent historic MI presented in the required format in order to remove the need for manual manipulation.

- Recent, high staff turnover rates, equating to an annual rate of over 60%, fall substantially short of ‘leading or good practice’ and would at best be classified as ‘adequate’.

3 Volumes of calls

This section analyses the past trend in volumes of calls made to ECAS and the possible trend of development during the remaining time of the contract.

The CHF is calculated as the ratio between the total costs of ECAS provision and the total number of calls to ECAS. Since a considerable proportion of the relevant costs is fixed, the total number of calls to ECAS has therefore the most important impact on the level of CHF.

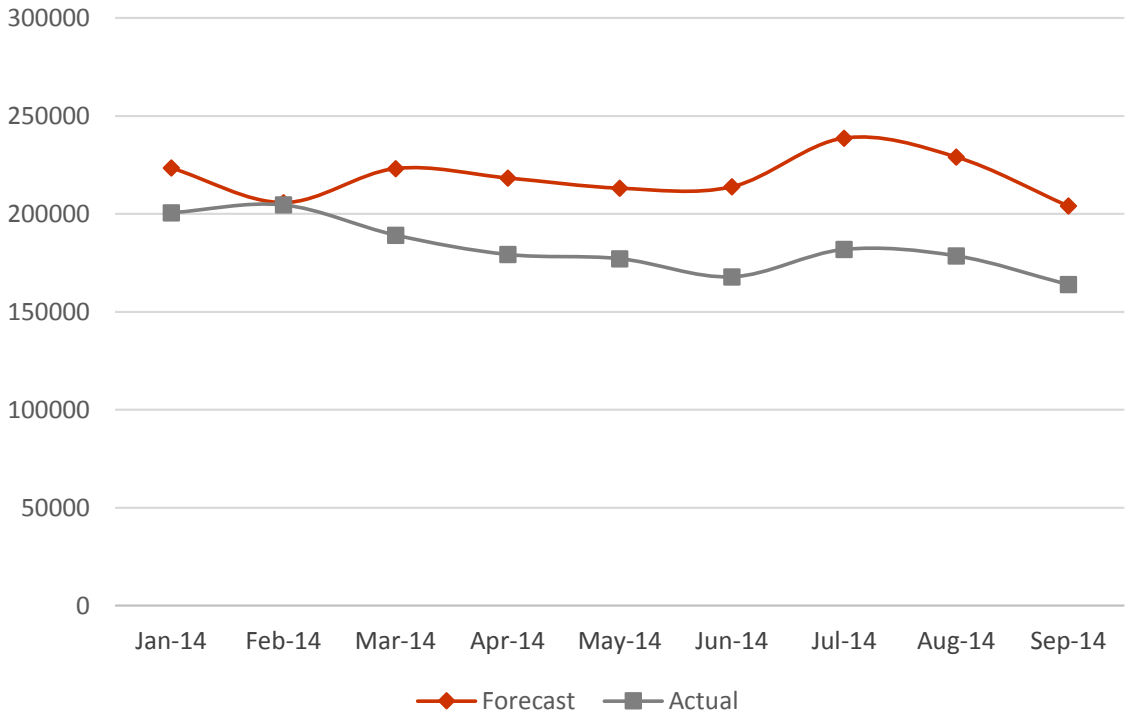
This section reports on the investigation into decreasing call volumes throughout 2014 and the implications on CHF between February 2015 and February 2016.

3.1 Actual versus forecast call volumes for 2014

In September 2013, the annual ECAS Review considered the historic trends in emergency call volumes and determined that the forecast for 2014 should be positioned at -3% of the calls that had been forecast for 2013. This was based on the actual calls received in the year 2013 to date which at the time (using available data to August 2013) were -2.9% of the forecast for 2013. Consequently, the total number of calls for 2014 was forecast to be 2,684,317. The historic seasonal trends and experience of effects of special events were applied to the annual forecast to provide the expected monthly, daily and intra-day volumes.

However, the actual calls received have deviated significantly from the forecast, as illustrated in Figure 3.

Figure 3 - Actual vs Forecast call volumes in 2014 - Year to date

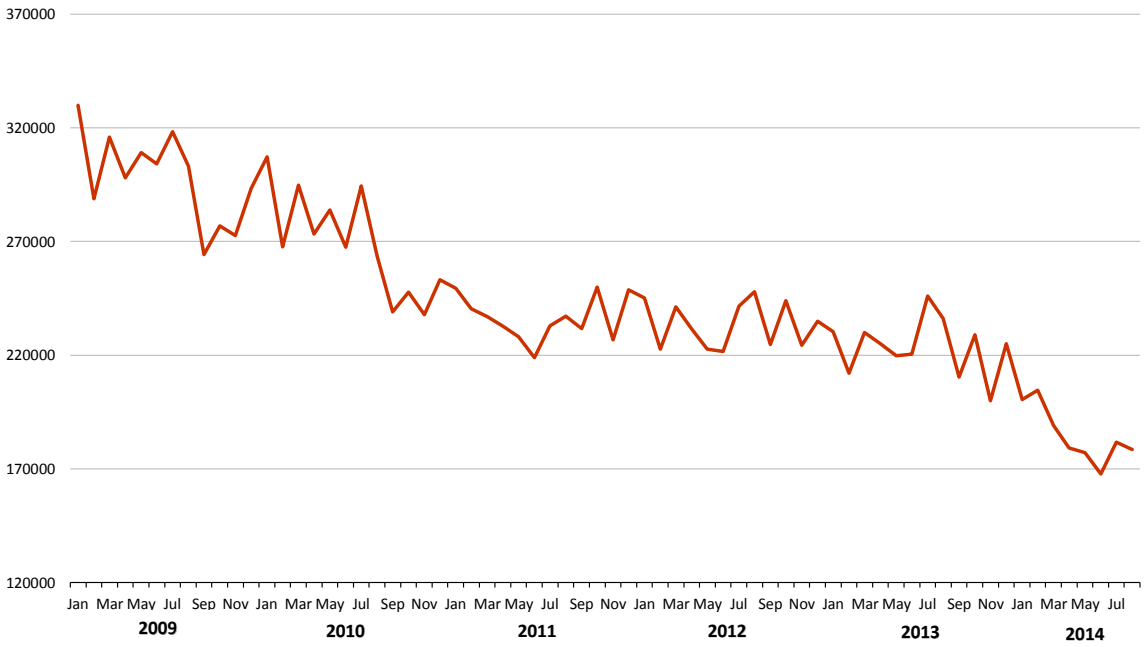


Source: Orbita analysis

From early 2014, a trend emerged of actual call volumes that were at variance from the forecast, reaching -26.1% with respect to the previous level for July 2013.

This trend is plainly illustrated in Figure 4 below which shows the monthly call volumes from January 2009 to August 2014. There is a clear change in gradient from around November 2013 onwards.

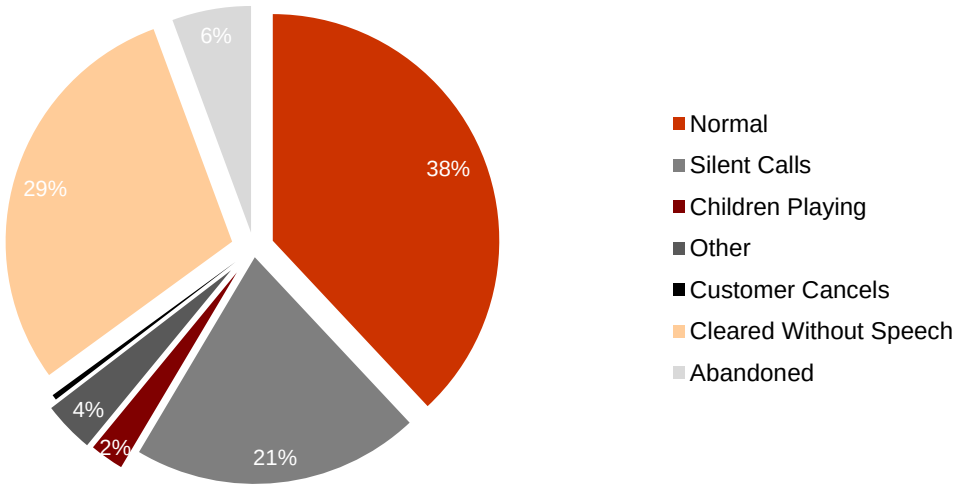
Figure 4 - Monthly call volumes 2009 to 2014



Source: BT Ireland, Orbita analysis

ComReg and BT realised immediately that the cause should be established and various insightful investigations have taken place throughout the year and at the request of the 2014 ECAS Review Team. The starting point was to determine if the overall reduction was due to volume changes in specific call types. Figure 5 shows how ECAS categorises key call types and their percentage contribution to the total number of calls – the chart was produced using data from July 2014 and is representative of the breakdown of calls for most months.

Figure 5 - Key call types and indicative percentages



Source: BT Ireland

Table 1 lists the definitions of the key call types. In addition, there are numerous spurious calls due to interference within the Eircom network, and these are classified separately as '112 Noisy'.

Table 1 - Definitions of call types

Call Classification	Definition	Speech Present?
Normal	A normal call where a person makes a service reqest and the call is transferred to an Emergency Service	Y
Cleared Without Speech	A call where the caller clears the call without making a service request	N
Silent Calls	A call which remains open without the caller speaking. These calls are triaged according to the "Silent Call" procedures	N
Children Playing	Calls from children that are triaged in accordance with the Young/Old Child/ Adult Playing procedures	Y
Abusive	A call from members of the public that are Abusive to the Operator where no request for an Emergency Service is made	Y
Non ES Help	A call where the caller makes a request for a service outside of the four named Emergency Service	Y
Misdials	A call where the caller indicates that they have made an error in calling the ECAS	Y
Customer Cancels	A call where the customer speaks and cancels the call	Y
Abandoned	A call that terminates before it can be presented to the next available Operator	N
Text Devices & Relay Services	Calls that present to the Operator via the Text Relay interface or are received by the ECAS Operator as a phone call from a registered Relay Service	N

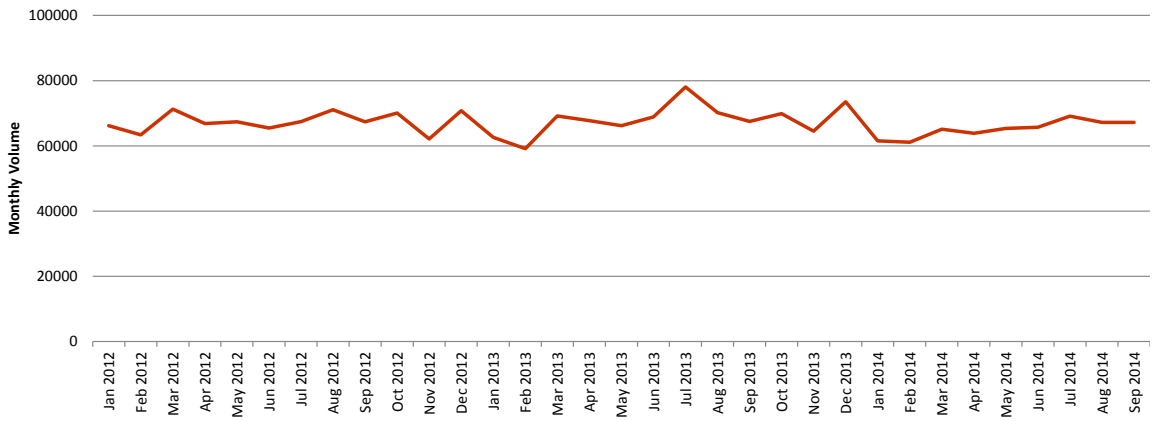
Source: BT Ireland

3.2 Reasons for forecast discrepancies

3.2.1 'Normal' calls

Firstly, it is important to understand if there have been significant changes in the number of genuine calls; and Figure 6 shows monthly levels of 'genuine' calls since 2012.

Figure 6 - Monthly 'genuine' call volumes Jan-12 to Sep-14



Source: BT Ireland

Clearly, there has been relatively little change in the volumes of these calls which are generally within a small tolerance of respective forecasts. Their relatively stable frequency and therefore predictability are similar to emergency call service experience elsewhere, for example in England the same observation can be said about the proportion of 'genuine' calls to 999 and 112 numbers as evidenced by routine 6-monthly studies that are carried out on behalf of the NHS[3].

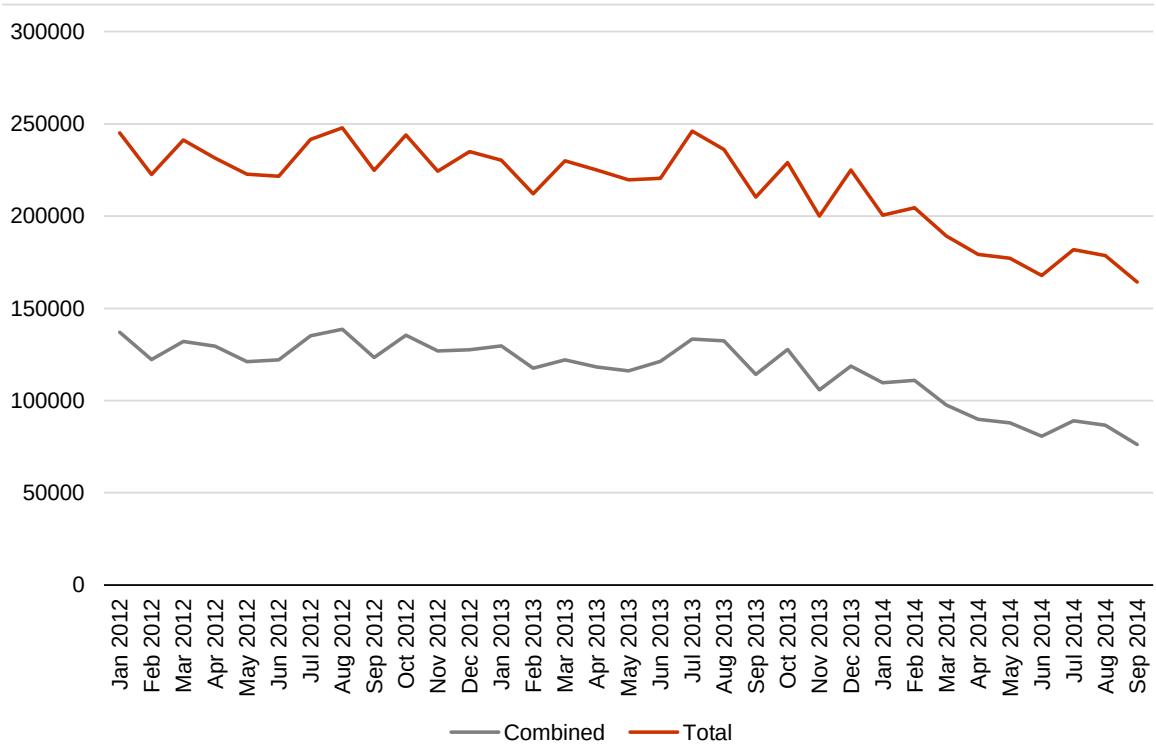
3.2.2 Reducing calls

Therefore, the unforeseen reduction in calls is due to decreasing volumes of some of the non-genuine calls.

Trends and fluctuations in the various non-genuine call types have been investigated and compared with the total monthly calls for the period January 2012 to August 2014. The analysis indicates that a group of three call types appear to contribute most to the reduction in calls, and this is demonstrated in Figure 7 below.

[3] *An analysis of data on the number and handling of 999 and 112 calls*, Simon Beresford, March 2014.

Figure 7 - Monthly call volumes: total and contributory call types



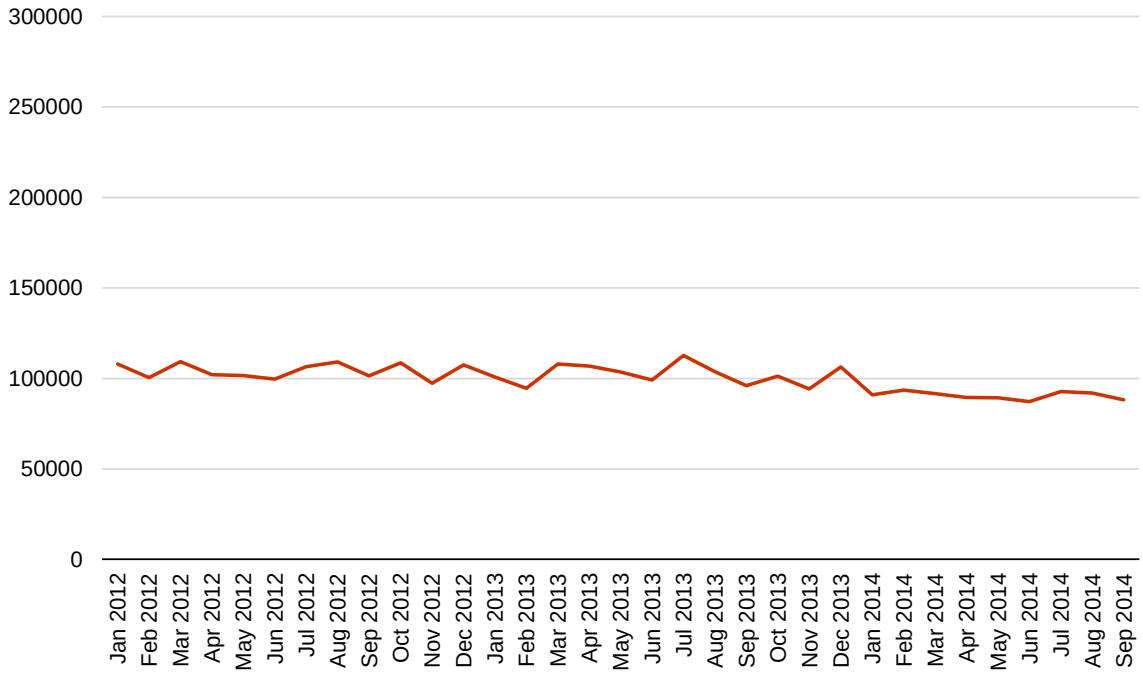
Source: BT Ireland, Orbita analysis

The 'Combined' line in Figure 7 is the sum of the following call types:

- '112 Noisy';
- '112 Silent';
- 'Cleared without Speech'.

Figure 8 shows the difference between the total volume of calls and the 'Combined' line. The difference is fairly constant over the measurement period and this illustrates how well the trend is explained by the changes in volumes of the contributory call types.

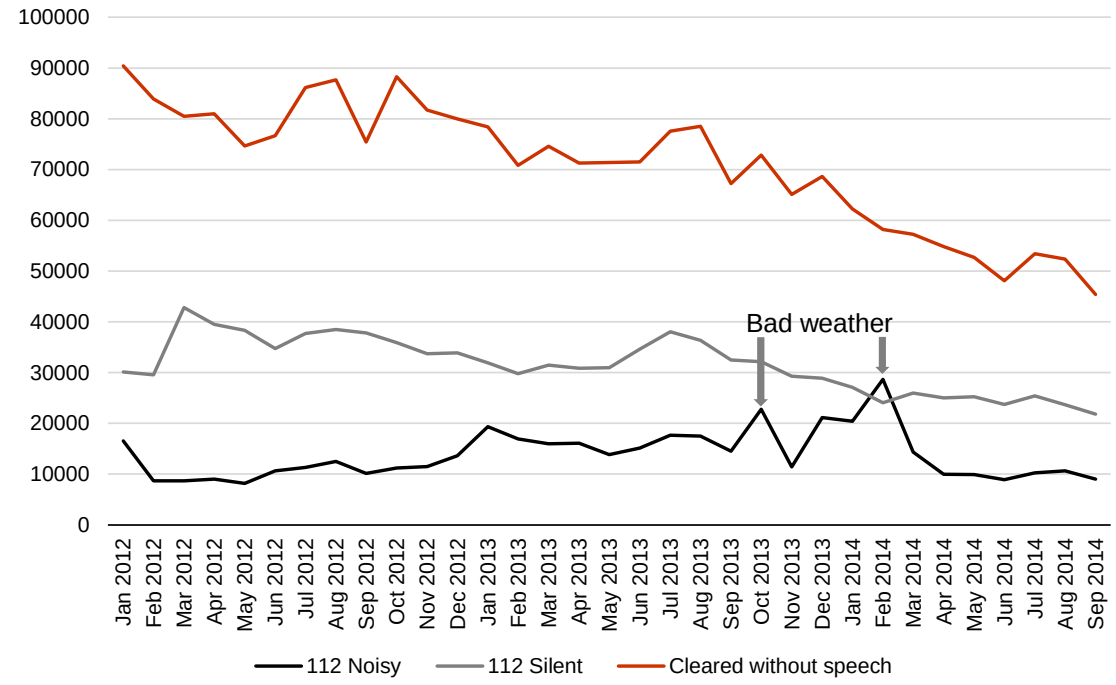
Figure 8 - Difference between total volume and trend contributors



Source: Orbita analysis

Figure 9 shows these call types separately.

Figure 9 - '112 Noisy', '112 Silent' and 'Cleared without Speech'



Source: Orbita analysis

3.2.3 'Noisy' Lines

Although Figure 7 illustrates that '112 Noisy' calls do not contribute specifically to the overall reduction in call volumes, some of the fluctuations are significant and introduce additional unplanned demand on the ECAS contact centres. The cause and effect are explained below.

Spurious calls due to 'Noisy' lines have been prevalent throughout BT's tenure as ECAS provider. They are caused by intermittent faults in the Eircom fixed line network which occur more frequently during adverse weather when wind and heavy rain are likely to shake the telephone lines and when water may ingress the infrastructure. The chart in Figure 9 above shows the incidence of these calls since January 2012; and the spikes in October 2013 and February 2014 coincide with the severe weather that occurred at these times.

Eircom has been aware of the problem since the cause was established, and each week BT supplies information to Eircom identifying the telephone lines that have generated more than 10 spurious calls. Although BT is not provided with specific details on Eircom's rectification work, the subsequent reduction in spurious calls from the identified lines indicates that an improvement program / scheduled maintenance is having a beneficial effect. An overall reduction in 'Noisy' lines does not happen – presumably because previously stable lines become 'Noisy' for various reasons, e.g. deterioration over time and weather-related.

It can be observed that there is a noticeable increase that often occurs during bad weather in 'Noisy' lines and then a decrease that occurs after bad weather, which suggests that this improvement results from subsequent necessary repairs to the network.

Of interest is the recent reduction in the incidence of 'Noisy' line calls since the 'bad weather' peak in February 2014, as this has partially influenced the shape of the recent trend in call reduction.

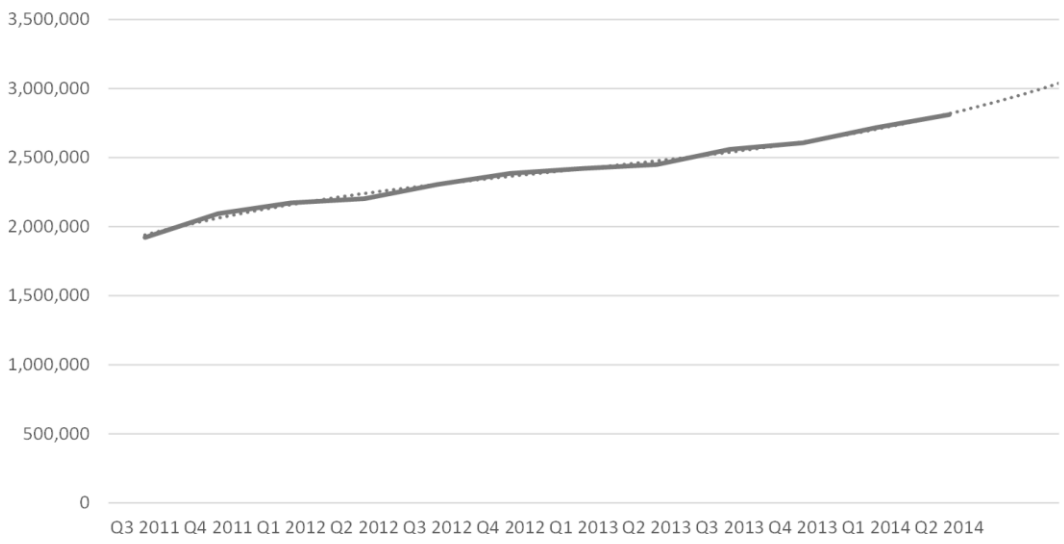
3.2.4 '112 Silent' and 'Cleared without Speech'

Inadvertent dialling of mobile phones is the main cause of '112 Silent' and 'Cleared without Speech' calls. This problem is predominantly associated with older mobile phones with keypads that are not locked – automatically leaving their buttons susceptible to being pressed when the devices are in pockets or handbags. These 'pocket dials' do not usually occur with smartphones because their screens and keypads usually need to be activated before each call.

Calls are classified 'Cleared without Speech' when the caller realises and cancels the call without any dialogue. Sometimes the mobile user is not aware that a call has been connected to ECAS and the operator must go through a prescribed procedure in order to be absolutely sure that the caller is not suffering from a problem that prevents speech. On concluding the procedure without a response from the user, the operator closes the call and enters the classification '112 Silent'. Consequently, the Call Handling Time (CHT) for 'Cleared without Speech' is just a few seconds whereas the procedure for dealing with silent calls results in a CHT of circa 30 sec.

As smartphones are progressively replacing older-style mobile phones, it can be hypothesised that the incidence of 'inadvertent dials' should reduce proportionately. Figure 10 is an extract from ComReg's quarterly Key Data Report on the Irish Communications Market showing the take-up of Smartphones in Ireland.

Figure 10 - Smartphone take-up in Ireland

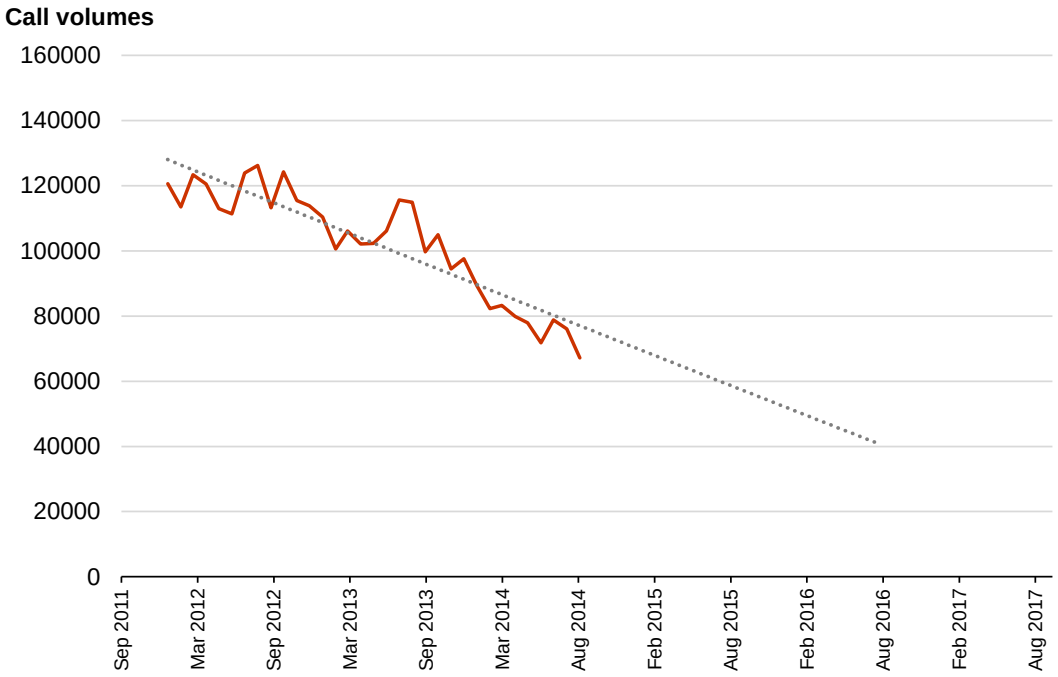


Source: ComReg

A regression analysis has been used to extrapolate the data to the end of 2014, indicating an increase of approximately 500,000 smartphones over the year, or 20%, from 2.5m to 3m. The Key Data Report also records the number of active SIM cards, and this was circa 5.4m over the period. This could indicate that in January 2014 there were 2.9m older style mobile phones, reducing to 2.4m by December 2014, or the equivalent of a 17% decrease.

Figure 11 indicates the profile of call volumes for those classified 'Silent' and 'Cleared without Speech'.

Figure 11 - Projected reduction in 'Silent' and 'Cleared without Speech' call volumes



Source: Orbita analysis

If all 'Silent' and 'Cleared without Speech' calls are assumed to be pocket dials or 'dials in error', then in January 2014, approximately 90,000 'inadvertent dials' occurred which is 3.1% of the 2.9m older style mobile phones that are expected to be in use at the time.

Using this percentage with the 2.4m older-style phones in December 2014, suggests that there should be approximately 74,500 'inadvertent dials' in December 2014, and this is close to the extrapolated estimate in Figure 9.

Although the above analysis is very tentative, it does support the hypothesis that increasing use of smartphones and corresponding reduction in 'inadvertent' dials is a key contributor to the reduction in call volumes.

That said, the move to smartphones has been occurring at a similar rate since Q3 2011, so why ECAS has not noticed an earlier decrease in 'Silent' and 'Cleared without Speech' calls? Figure 9 does show that these calls have been reducing, but in earlier years it is likely that other factors were changing the volumes of other call types and masking this trend. Also, over these earlier periods BT will have improved call handling procedures and call classifications enabling greater insights into the reasons for fluctuations and trends in call volumes. The investigation into noisy lines is a good example of the progress made to understand the call types and reasons for their occurrence.

3.2.5 Reducing non-genuine calls is good news

Although the dramatic decrease in call volumes since November 2013 and throughout 2014 was not forecast, available information on the reasons demonstrates a collective effort to make improvements and reduce the non-genuine calls. This is therefore good news. Demand forecasting and capacity planning can focus more on the genuine call volumes and with a greater granularity on the other call types – resulting in a more streamlined operation with less wasted effort on spurious calls.

3.3 Forecast call volumes for 2015 and 2016

There is a plausible explanation for the lower than forecast call volumes during 2014. The lower volumes are due to:

- A corresponding reduction in 'Silent' and 'Cleared without Speech' calls;
    - Which can be explained by the progressive take-up of Smartphones;
    - With an equivalent reduction in the use of older-style mobile phones;
    - And a proportionate decrease in 'pocket dials' and 'dials in error';
- Action taken by the mobile service providers to stop inadvertent connection to ECAS if pocket dials include additional key presses beyond 112;
- Ongoing repair and maintenance work to the fixed line network which reduces calls due to noisy lines.

The forecast for 2015 and for 2016 takes account of the continuing downward trend in these call volumes.

- The actual annual call volume for 2013 was 2,684,324;
- The 2013 ECAS review forecast 3% fewer calls in 2014, giving an expected annual call volume of 2,603,794.

Three scenarios are defined below for 2015 and 2016.

3.3.1 Baseline Scenario 1

- Scenario 1a:

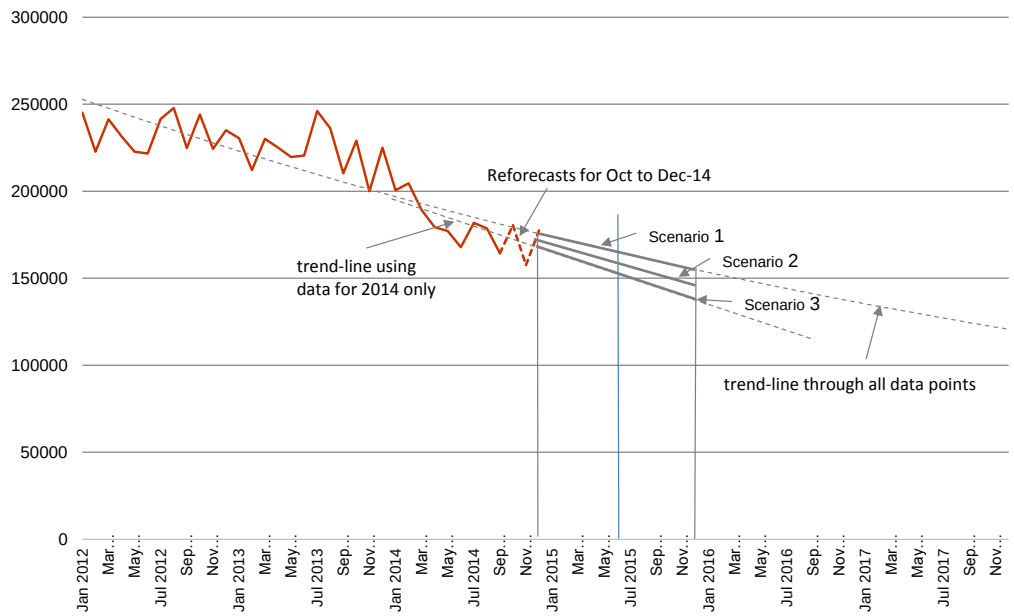
- Using the information currently available for the year to September 2014 the monthly call volumes are on average 18.9% lower than 2013;
- Assuming call volumes stay 18.9% lower than 2013 for the remainder of 2014 suggests an annual call volume of 2,176,987.

- Scenario 1b :
  - For June 14 to September 14 inclusive the monthly call volumes are 24.1% lower than the equivalent period in 2013;
  - Using actuals for January 14 to September 14 and assuming calls will be 24.1% lower than 2013 for October 14 to December 14, gives an annual call volume of 2,139,218.

Scenario 1 is built by taking a mid-point between scenarios 1a and 1b to provide a re-forecast of the annual call volume for 2014, giving 2,158,102. This is 19.6% lower than the actual call volume for 2013.

For 2015 and 2016, scenario 1 is built as follows. Figure 12 below shows an extrapolation of the monthly call volumes through 2015 and 2016 using all the data from January 2012 to December 2014.

Figure 12 - Extrapolation of call volumes through 2015 and 2016



Source: BT, Orbita analysis

On this basis:

- The forecast of annual call volume for 2015 would be 1,980,000. This is calculated by taking the mid-year monthly call volume 165,000 and multiplying by 12.
- This would be 8.2% lower than the re-forecast total for 2014.
- If the trend continues at -8.2%, then the forecast of annual call volumes for 2016 would be 1,819,000.

3.3.2 Scenario 3

Scenario 3 is built by assuming a continuation through 2015 of the latest downward trend in call volumes over January 14 to December 14 which is running at an average of -19.6% with respect to the same period in 2013.

- The forecast of annual call volume for 2015 would be 1,830,000. This is calculated by taking the mid-year monthly call volume (152,500) and multiplying by 12.
- This would be 15.2% lower than the re-forecast total for 2014.

This assumes that the 'Silent' and 'Cleared without Speech' calls will continue to decline in line with the more recent trend shown in Figure 11. This appears reasonable given the correlation of the decline with the take-up of smartphones which should continue through 2015 and 2016, at which time smartphones would still only be approximately 75% of the active SIM card total.

3.3.3 Scenario 2

Scenario 2 is placed mid-way between scenarios 1 and 3.

- The forecast of annual call volume for 2015 would be 1,905,000.
- This would be 11.7% lower than the re-forecast total for 2014.

3.3.4 Selecting the forecast for 2015

Scenario 1 is based on more data points (January 12 to December 14) and from a pure mathematical perspective the forecast should be more valid. However, the trend-line for Scenario 1 will be influenced by many other transient factors that have occurred over the longer period of time, and the associated forecast may be too conservative.

The latest decline in call volume cannot be ignored, and Scenario 3 is based on a more accurate trend that has become more noticeable in 2014. Can we

determine if this trend will continue throughout 2015? We know that the decreasing call volumes are due to reductions in 'Silent' and 'Cleared without Speech' calls (the majority of which are 'pocket dials') and we have linked this to the increasing take-up of smartphones and the proposition that they are less likely to produce 'pocket dials'. The increasing use of smartphones has continued at a relatively constant rate over recent years and looks set to continue. At some point in the future, the remaining users with older-style mobile phones will consist mainly of a group of reluctant adopters who may never move to smartphones. As this threshold approaches, the take-up rate should reduce and finally level-off.

However, even if take-up continues at the current rate then by the end of 2016, smartphone users would still be just approximately 75% of the active SIM card users. So, it is unlikely that the threshold of reluctant adopters would be reached in 2015.

The above argument – although lacking full objectivity – suggests that Scenario 3 represents a more accurate forecast of the call volume for 2015, and therefore, the CHF should be calculated using an annual call volume of 1,830,000. For the time-being this CHF could be considered to be nominal and confirmed before it becomes effective in February 15 by which time additional call volume data will be available for October to December 14.

In order to respond quickly to any significant deviation from the forecast for 2015, TERA – Orbita recommends that BT introduces a monthly forecasting process to learn from the experience of actuals v. forecast and to inform the capacity planning process. Thereby, resourcing can be adjusted promptly to ensure adequate cover with respect to any fluctuations in demand.

4 Financial analysis and CHF

This section reviews all the costs incurred by the ECAS operations since last year's review, i.e. between Q1 2013/2014 and Q1 2014/2015.

The costs can be categorised into two main types: in-life costs (see section 4.1) and financial costs (see section 4.2). In-life costs consist of operating and capital expenditure (OPEX and CAPEX respectively), the latter being depreciated over the lifetime of the contract.

Following the cost review, the new level of CHF is calculated and recommended for the period between February 2015 and February 2016 (see section 4.3).

4.1 In-life costs

This section details and analyses the operating and capital expenditures made by BT.

ECAS OPEX include

- Call centre staff costs (operator costs);
- Management and support costs from BT (BT pay);
- Non-pay costs such as accommodation and third-party costs.

ECAS CAPEX are depreciated over the lifetime of the contract.
As can be seen from Figure 13 below, as of Q1 2014/2015, call centre Operators and CAPEX depreciation account for more than ✂ of total costs.

Figure 13 - Breakdowns of BT ECAS in-life costs Q12014/2015

✂

Source: BT, TERA Consultants analysis

It should be noted that for the one-year extension of the Concession Agreement, quarterly depreciation costs would be much lowered as the majority of CAPEX has already been depreciated previously.

Figure 14 - Breakdowns of BT ECAS in-life costs Q12016/2017 (forecast)

✂*Source: TERA Consultants*

The primary source of information for the costs incurred by BT for the provision of ECAS is the Cost analysis Q1 2014/2015 produced by BT for ComReg, and the Quarterly Management Accounts, Q1 2014/2015. BT also provided other information as requested by ComReg during the review.

4.1.1 Operator costs

A sub-contractor provides BT with call centre Operators, which entails training and a lead operator with managerial responsibilities for all the Operators. BT pays a fixed charge per hour for each hour requested from the sub-contractor. The hours include those incurred by the Operators, the Lead Operator and training hours. The sum of costs incurred by the Operators, the training hours and the Lead Operators makes the total costs of the sub-contractor Operators.

Operator costs currently represent about one third of BT's ECAS costs (see Figure 13).

To assess whether the costs paid by BT to BT's operator sub-contractor for the supply of the call centre operator staff are reasonable, it is necessary to verify that the cost per hour and the number of operator hours paid by BT are reasonable. The review thus consists of:

- Review of the hourly rate paid by BT to its subcontractor;
- Review of the workforce management and number of operator hours.

4.1.1.1 Operator cost per hour

Different components of the hourly rate paid by BT to its contractor have been analysed. The hourly rate is made of the following elements:

- Basic rate (for wages to call Operators);
- Bonus;
- Employers Pay Related Social Insurance (PRSI);
- Churn;
- Uplift for unavailable hours;
- Resourcing;
- Call centre coordinators;

- Trainers;
- Recruiters;
- Agency and recruitment;
- Overhead;
- EBITDA margin.

In the first review in 2011, TERA and ComReg carried out a thorough and rigorous benchmark and analysis on each cost item, which led to a significant revision of the hourly cost from €34.72 to €28.07, the equivalent of a 19% reduction. This rate has prevailed since then.

Recently, BT has proposed to ComReg to increase the basic hourly rate to the call Operators from €✂/hour to €✂/hour, equivalent to a ✂% increase. This proposal is based mainly on two observations:

- According to an independent industry benchmark4, the pay to ECAS call Operators is not competitive compared to job opportunities elsewhere, which offer an annual salary between ✂ and ✂ against circa. €✂currently offered to ECAS Operators. Furthermore, the staff turnover rate among the Operators has recently increased reaching 60% annually (see section 2.2.6). This can partly be due to the low pay rate.
- Some Operators have worked for ECAS for a number of years and their pay does not reflect their long-term experience.

It was decided that the proposed increase to operator's hour is reasonable in light of the two observations above. A new total hourly cost is recalculated as shown in Table 2.

[4] CCMA Industry Research 2014

Table 2 - Operator cost per hour

Cost components	Previous reviews	This year's review
Basic	✂	✂
Bonus (✂)	✂	✂
Employers PRSI (10.75%)	✂	✂
Sub-total	✂	✂
Churn	✂	✂
Rate per paid hour	✂	✂
Uplift for unavailable hours	✂	✂
Resourcing	✂	✂
Call centre coordinators	✂	✂
Trainers	✂	✂
Recruiters	✂	✂
Agency and recruitment	✂	✂
Sub-total	✂	✂
Overhead	✂	✂
Sub-total	✂	✂
Rate of return	✂	✂
Sub-total	✂	✂
Contractual variance	✂	✂
Hourly rate	**28.07**	**29.34**

Source: BT

Given the independent industry benchmark that shows more competitive pay rate elsewhere and the fact that experienced call Operators have not received a pay rise for the last three years, TERA Consultants is of the view that the new hourly rate of €29.34 is reasonable.

4.1.1.2 Workforce management training and number of operator hours

The workforce planning (WFP) life cycle has the following elements, and for ECAS, responsibility is divided between BT and Conduit as follows:

- Forecasting (BT);
- Capacity plans (BT);
- Schedule production (Conduit);
- Schedule management (Conduit);
- Performance management (Shared);
- Intraday management (BT);
- MI & Reporting (BT).

Figure 15 - Work force planning life cycle

Source: Orbita

The accuracy, efficiency and effectiveness of WFP are key aspects of the review as they determine the level of resource deployed and hence the number of call handling staff hours charged by Conduit to BT. The associated cost is one of the main drivers of the call handling fee.

4.1.1.2.1 Forecasting

Demand forecasting is based on predictions of call volumes and average handling times, and for ECAS it is undertaken by BT. It is standard practice within the industry to perform long, medium and short-term forecasts.

BT's forecasts are produced using an Excel spreadsheet, which is suitable for an operation of this size with a single channel and single agent skill set. The model is user-driven – so requires manual updates of historical telephony data and to transfer staffing information to the scheduling system:

- Long-term Demand Forecasts are produced for the calendar year at a monthly granularity for inbound call volumes, the rate of increase/decline is agreed with ComReg at the beginning of the year and is not subject to review.

- Medium-term Demand Forecasts are produced approximately six weeks in advance for a calendar month. The period of the forecast will be four to five weeks (depending on the number of weeks that cover the calendar month). These forecasts are based on historical analysis of the corresponding period from the previous year to understand the day of month and intraday period profiles. They cover both call volumes and call

handling times at an intra-day (15-minute interval) level. The intra-day volumes are used to produce a smoothed profile called the Time of Day factor (TOD), which is combined with the long-term monthly volume forecast to produce the anticipated call demand.

- Short term daily or intra-day re-forecasts are not formally undertaken, though operations management will review and confirm the scheduled Operators either if the on day service levels are not being met or if expected resource levels are not attained due to sickness or other absence.

Exceptional events are identified in the historical analysis in case they impact on the forecast profile; in addition seasonal events such as Christmas are factored into the TOD for the corresponding period. However, there is no routine consideration of other influencing factors such as:

- Population demographic shifts;
- Impending operational process updates / changes;
- Other volume influencers (e.g. use of smart phones).

Call forecast accuracy is being monitored, though not formally reported. It is measured on a daily, weekly and monthly basis but does not include an intraday period analysis. The accuracy of the forecasts against actual volumes in this calendar year has not been as close as previous years:

- Average daily forecast accuracy -20.5%;
- Average weekly forecast accuracy -16.1%;
- Average monthly forecast accuracy -16.0%.

This drop in overall call volumes is explored in more detail in the call volume analysis (see section 3.2).

Staffing levels have remained relatively static during 2014 as they are calculated on the 2014 forecast, with the resultant drop in call volumes causing a low rate of staff utilisation. These conditions can lead to low staff morale and high churn rates. Health and safety directives require that at least two members of staff are in attendance at any time; and from an operational viewpoint, an additional operator is always scheduled to cover breaks. The occasions that lead to over-staffing across the three sites will increase if there is a continued reduction in call volumes.

4.1.1.2.2 Capacity plans

The responsibility for capacity planning is divided across BT and Conduit and is done in line with the medium term forecasts. It is focused purely on the level of staffing. The responsibility for each stage in the process is as follows:

- BT utilises a manual spreadsheet to undertake the capacity calculations. This is linked manually to the forecasting spreadsheet and employs industry standard formulae to calculate the level of call handling resource required by 15 minute intervals. It includes a number of constraints and uplifts to arrive at the required resource profile:
    - Minimum staffing considerations across the 3 sites (all must be at minimum 2 Operators available, Conduit then adds another operator to cover breaks, there is therefore always a minimum of 3 although BT does not pay directly for this additional resource);
    - ✂% increase for unscheduled breaks / screen rest (DSE);
    - Rounding to whole operator numbers.
- This gives the base hours, Conduit must provide available staff at this level to ensure required service levels are met;
- Conduit applies an agreed shrinkage factor (✂%) to the base hours required, that allows for the following off-phone activities:
    - Refresher training;
    - Coaching and feedback;
    - Meetings;
    - 1 to 1s;
    - Paid breaks;
- The resulting hours are chargeable to BT;
- Further shrinkage for sickness, annual leave, other absence, additional training, coaching and meetings are then implicitly built into the level of staffing passed to the scheduling process. These elements are accounted for in the calculation of the hourly rate charged for call taker time and are reported as equating to ✂%, that is to cover sickness/absence (✂%) and annual leave (✂%).

In line with the recommendations made in 2012, Conduit has removed the practise of adding an additional ✂ to the staffing figure where the requirement per 15 minute period is above 4.5 call takers in formulating the base hours.

Some areas and questions remain. They impact on the level of hours Conduit can bill to BT. For example, as all three sites are operational 24x7 there is a significant proportion of intraday periods where the minimum staffing requirement per site (two Operators) results in a planned level over and above the number needed to maintain services levels. However, it is recognised that BT is subject to contractual obligations under the Concession Agreement to have three sites operational 24x7 and therefore, little can be done to prevent this over resourcing.

4.1.1.2.3 Schedule production

The scheduling process is unchanged from the previous reviews, hence the key observations remain:

- The scheduling function is run by a dedicated Conduit resource.
- Although schedules are produced in Aspect WFM software, the available automation and optimisation is not being utilised. The Scheduler uses a less efficient manual process that is started from scratch each time. This could also result in an uneven allocation of shifts and days.
- Staff are grouped into three categories: Days, Nights and Part-time. Shifts are rotated within these parameters. This simplifies the process, but does reduce the flexibility available to the scheduler.
- There is an informal link to the training and recruitment function to inform requirements and activity.
- A rule of thumb is applied to increase the base hours' requirement by at least two Operators in any one period to cater for the shrinkage allowances (and potentially up to 6 more than requirement). This is a simplistic methodology and greater efficiency could be gained from understanding training and other off phone requirements in more detail to enable more specific planning.
- Leave is tracked and managed via a spreadsheet. Requests are presented to the Scheduler for approval. The decision is based on ability to maintain coverage.
- Weekly reviews take place between the Scheduler and the Service Coordinators to discuss the week ahead in terms of staff coverage against

the requirement at an intraday level and to understand the holiday requests / allowances. This is in line with expected practise for an operation of this size and complexity.

- No specific analysis is done to feed into the recruitment process in terms of hours of coverage etc. Recruitment tends to be like for like replacements e.g. night shift, part-time, etc. This means it is likely that the optimum mix of staffing is not known and the current model is perpetuated.

- The over allocation of resources leads to low utilisation levels, which is being compounded by the reduction in volumes.

In summary, the function is well established and creates consistent rosters that are in line with the current requirements for efficiency and effectiveness. There are however opportunities to streamline and formulise the build process and there are also steps that could be taken to improve the efficiency of resource deployment. These would enable a more efficient use of Operators, though the current three site operating model means that any improvement opportunities are limited.

4.1.1.2.4 Schedule management

The processes to manage schedules are unchanged from 2012 – they are the responsibility of Conduit and performed by the same scheduling function, with input from the Service Coordinators:

- Weekly reviews take place between the Scheduler and the Service Coordinators to discuss the week ahead in terms of staff coverage against the requirement at an intraday level and to understand the holiday requests / allowances. This is in line with expected practise for an operation of this size and complexity.

- The schedule is accessed at each site by a terminal that links to the eWFM system. Operators do not have access to the system; shifts and breaks are communicated via printouts to staff on a daily basis. The lack of direct access to the eWFM system means that the management of schedules is a far more manual process, but the reduced cost of licences may offset this activity. The relatively small size of the operation means that it is not too onerous to release and manage the schedules in this way.

- Late requests for absence, e.g. for holidays, training, etc. are considered, with a general rule in place that a reduction of one operator per shift, per centre, per day can be accommodated. Any requests that may exceed this

rule will be the responsibility of the local Service Co-ordinator to accept or decline.

- As agents are not directly logged into the workforce planning system, schedule adherence is manually recorded but is limited to significant events such as coaching and Lead Operator duties.

- Adherence to shift and break start and end times is not measured and therefore the true level of schedule adherence is not fully understood. It should be possible to link the Automatic Call Distributor (ACD) into the workforce planning system and therefore upload data on Operator activity which would allow automated adherence reporting down to timing of breaks, etc. Nevertheless, this should be done with consideration against the cost of the increased eWFM licences that may be required.

Currently the activity undertaken to manage schedules is in line with requirements, though the importance of more rigorous schedule management and adherence would increase if the level of latent operator capacity is reduced.

4.1.1.2.5 Summary of findings

Demand forecasting

- Forecasts are set in conjunction with ComReg during the annual ECAS Review which takes place in September using data up to August inclusive. In September 13, the year to date forecast was -2.9% below the equivalent volumes for 2012 and, in the absence of any evidence otherwise, it was assumed that the rate would continue throughout 2014. However, the monthly call volumes being experienced are lower than forecast to an extent that forecasting accuracy is outside leading practise expectations. This looks likely to continue for the remainder of 2014, until the annual ECAS review provides an updated set of forecast volumes.

- Some secondary inputs to long and medium term forecasts may be missing – from internal (BT) and external sources, for example; changes in the transfer process to ECAS by mobile operators – which reduces accuracy.

Capacity planning

The planning tools and methodology are in line with the operational requirements and efforts have been made where possible to align with recommendations made in previous reviews.

Scheduling

As with forecasting and planning, the current tools and processes are in line with the operational requirements for efficiency and effectiveness, but they do not meet best practice procedures. This means that scheduling performance metrics such as efficiency, staff utilisation and adherence are either not measured or below industry standards.

The practise of over resourcing to a minimum of 2 at all period means that, whilst service performance is not compromised, there is a systemic level of inefficiency built into all the schedules that is over and above the levels of shrinkage necessary.

The compound result of the planning and scheduling process plus the operational design is a very low utilisation rate of staff (circa ✂% of logged in time spent on calls) due to the following factors:

- Lower than forecast volumes;
- Three site operation;
- Minimum staffing levels by site;
- Significant levels of shrinkage in planning;
- Contingency in resource schedules;
- Inflexible staffing framework (shift lengths and flexibility of staff hours).

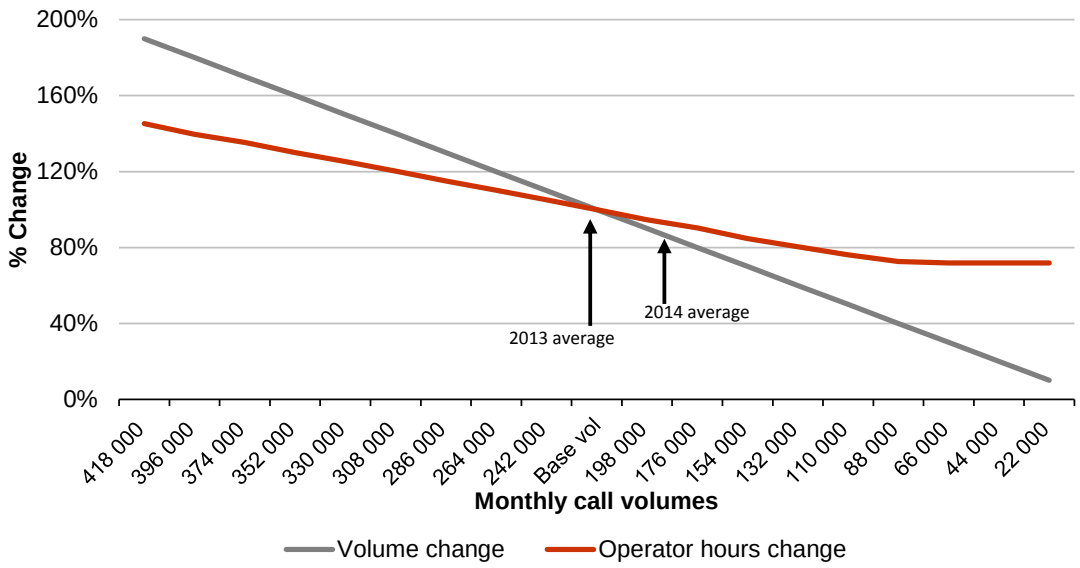
It is accepted that a number of these factors are constrained by the contractual arrangements, it is also understood that the criticality of the service means that adherence to service levels is paramount.

Sensitivity analysis

Given the various uplifts to staffing being applied in both the planning and scheduling processes, a non-linear relationship between volume variation and staffing is created. This is to be expected in a call handling environment, but the resourcing constraints within the ECAS process have accentuated this. It means that there is a higher than expected minimum staffing threshold, this is a minimum level of resource that would be employed regardless of how low call volumes become. The recent reductions in call volume mean that the minimum staffing threshold is being reached at certain points in the day on a more regular basis than before.

Given the observed trend of reducing call volumes, sensitivity analysis was carried out using the planning model to demonstrate the relationship between volume change and staffing hours required.

Figure 16 - Call volume change and staffing: sensitivity analysis



Source: Orbita analysis

Figure 16 shows variations in call volumes around a baseline of 220,000 calls per month – with call handling time and other staffing parameters remaining the same. The change in volumes does not cause a corresponding percentage change in operator hours required. The current deployment of staff and associated chargeable hours has not followed this reduction profile, as the basis for the calculation of operator hours is the annual call forecast, which did not anticipate the volume reduction being experienced in 2014. There are also additional considerations on the 3rd party provider and their ability to resource to the lower levels, given the current three site model and employment framework needed to retain staff.

Table 3 - Call volume change vs operator hour change

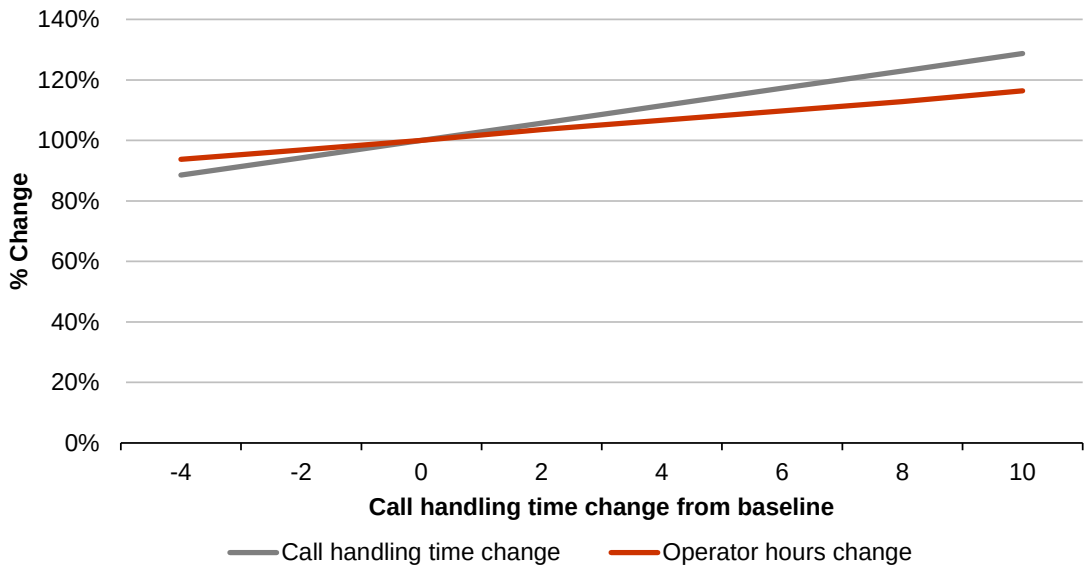
Monthly call volume	% step change in volume from baseline	% step change in Operator hours from baseline
418,000	+10%	+5.6%
396,000	+10%	+4.2%
374,000	+10%	+5.3%
352,000	+10%	+4.7%
330,000	+10%	+5.1%

308,000	+10%	+5.2%
286,000	+10%	+4.9%
264,000	+10%	+5.0%
242,000	+10%	+5.2%
220,000 (baseline)	0%	0%
198,000	-10%	-4.3%
176,000	-10%	-5.5%
154,000	-10%	-4.4%
132,000	-10%	-4.2%
110,000	-10%	-3.6%
88,000	-10%	-0.7%
66,000	-10%	0%

Source: Orbita analysis

From the volume analysis it has been deduced that the unexpected decrease is due to a reduction in 'Silent' and 'Cleared without Speech' calls which have a lower call handling time (CHT) than 'Normal' (or genuine) calls that require transfer to an emergency service (see section 3). The volume of genuine calls has remained static in this period of overall volume reduction, therefore it follows that the overall CHT average will be increasing. A similar sensitivity analysis process shows the relationship between CHT change and the staffing hours (see Figure 17).

Figure 17 - Call handling time change and staffing: sensitivity analysis



Source: Orbita analysis

As with volumes, a percentage change in CHT is not mirrored by the percentage change in Operator staffing hours, the operating and staffing model of ECAS provides a damping effect.

Recent monthly reporting by the ECAS operation has shown this expected trend of an increase in the call handling time is due to the increasing absence of non-genuine calls that have lower CHT ('Silent' and 'Cleared without Speech'). The overall CHT has risen from a consistent monthly average of around 32s in 2013, to between 33s and 34s. Should non-genuine call volumes continue to decline further (which is anticipated as explained in section 3, further increases in the overall CHT will occur as the average duration will move closer to that of genuine calls which is circa 55s based on data provided by BT. The call volume analysis has provided three forecast scenarios based around a further decrease of the silent call types. Using this analysis and applying the current CHT figures by call type (as per August 2014), a new overall CHT can be predicted for 2015 based on a weighted average.

Table 4 - Call volume change and associated CHT change

Call volume change	Associated CHT change
-8.2%	+1.5 s
-11.7%	+2s
-15.2%	+3s

Source: Orbita

The predicted CHT increases are used in conjunction with the volume forecasts for the CHF calculations.

4.1.2 BT pay costs

BT pay costs result from BT's responsibility for the overall service performance. There is a management team present at each PSAP to coordinate the call centre Operators and to ensure a smooth functioning of the day-to-day ECAS operations.

The pay costs for the provision of ECAS fall within three categories:

- BT Direct Labour Cost: this corresponds to the costs of the core managerial and technical team responsible for ECAS, including for example First Line Managers and 24*7 service engineers (see section 2.1 for more details);
- BT Direct Support costs: this corresponds to the costs of the legal, regulatory and finance teams;
- BT Other support function costs: including logistic functions, network management centre, field transmission team, time recording management function, management function, conference call, project delivery management function dedicated to ensure the successful delivery of the setup of the ECAS.

The breakdown of different BT pay costs in Q1 2014/2015 is given in Figure 18 below. ✂

Figure 18 - Breakdowns of BT pay costs in Q4 2014/2015

✂

Source: TERA Consultants' analysis of BT's data

TERA Consultants has reviewed all items of each type of cost to verify whether these costs were reasonable. For this year's review in particular, a review was also undertaken on how the time spent on ECAS by BT staff was recorded and verified.

The staff time spent on ECAS is monitored by the ECAS Finance Manager who keeps a record ECAS Cost analysis on a monthly and quarterly basis. There are two systems of time record among BT ECAS staff:

- BT core management staff such as the Head of Operations, the Service Manager and the Engineers have daily historic time records that they book on an IT platform called 'Clarity'. Each staff needs to record the number of

hours they have spent on ECAS each day on a weekly basis at minimum. The Clarity platform on which the hours are recorded is not dedicated to ECAS only and is also used by all BT staff to book their time for all services run by BT. The number of hours spent therefore is verified twice: firstly by the Line Manager (within the BT organisational structure) of the staff in question and secondly by the ECAS Finance Manager who gets a report of the time spent by the ECAS management team at the end of each month and who integrates the reports into the ECAS Cost analysis.

- Other support staff involved in the provision of ECAS also have a daily historic time records. Information of time spent on ECAS is recorded in a timesheet system by individual staff. The timesheet is then reviewed by the corresponding Line Manager of the staff, for example the Head of the Legal team reviews the timesheet of a Solicitor who has recorded her time in the Solicitor Time and Information system. At the end of each month, the staff send their respective timesheets to the ECAS Finance Manager who then integrates these into the ECAS Cost analysis.

Based on a spot check and discussions and information received during the Clarity and timesheet system review, there is no reason to question the authenticity of the recorded time spent on ECAS by BT staff that are involved in the ECAS operations. Furthermore, both timesheet systems are also reviewed by an independent auditing firm as part of the annual audit of BT operations.

As for the cost review, TERA Consultants notes the following elements:

- For BT Direct Support, TERA Consultants notes that since April 2014, the Head of ECAS Operations started working 80% Full Time Equivalent (FTE) and a new position of a Centre Manager was created to manage the day to day operations of the ECAS Operator Centres. A Centre Manager, previously an FLM, was appointed, reducing the FLM team from six to five and leaving the overall headcount at management level unchanged. This has resulted in a saving of around €✂ per annum.

  TERA Consultants has assessed that the new structure is necessary for the ECAS operations and considers the costs associated with these positions reasonable.

- BT Direct Support Costs have reduced by nearly a quarter, from around €✂ per quarter in last year's review to approximatively €✂ per quarter in this year review (calculated from Q2 of the previous year to Q1 of the review year)

- The costs incurred by other support functions have remained stable compared to the previous review at around €✂ per quarter.

TERA Consultants has taken into account these elements and consider that the costs submitted by BT to be reasonable and can be included in the calculation of the CHF.

4.1.3 BT non pay costs

BT non pay costs consist mainly of the following elements:

- Accommodation and computing costs;
- Third Party Costs (HR, payroll);
- Other staff costs;
- Premises and related costs;
- Maintenance Costs (for fixed assets);
- Administration costs;
- Network Services (leased lines, data centre, termination charges).

According to Figure 19, the most important components are premises (✂%), maintenance (✂%) and network services (✂%). It should be noted that BT non pay costs represent only about ✂% of BT's ECAS costs (see Figure 13).

Figure 19 - Breakdown of BT non pay costs in Q1 2014/2015

✂

Source: TERA Consultants' analysis of BT's data

This year's review found that the majority of BT non pay costs have been stable compared to the previous review, for example, for the most important cost components of BT non-pay costs:

- Premise charge remains at around €✂ per year, this includes rents, electricity and water supply and other service charges for the three call centres;
- Maintenance charge remains at around €✂ per year, which is paid mainly for IT maintenance;

- Charges for network services remain at around €✂ per year, consisting mainly of STM1 and circuit costs (for data transmission), data centre, mast rentals and telecommunications services. For the review of STM1 and circuit costs, BT was asked to provide a comparison between the charges submitted by BT and the cost of the same service provided by Eircom. The comparison showed that the costs could not have been lowered if BT had bought the service from Eircom;

Overall, TERA Consultants is of the view that the submitted BT non pay costs can be considered to be reasonable.

4.1.4 Depreciation of capital expenditure

An important cost component of ECAS is the annual depreciation charge. The estimated depreciation charge is €2.2 million per annum. This is based on an initial investment of approximately EUR11 million, which is being written-off over the term of the Concession Agreement.

During the set-up phase, BT invested in a number of fixed assets necessary to support the ECAS operation. This fixed asset investment consisted of the purchase of the required fixed assets and also the time spent by BT personnel (technical, management, procurement etc.) in designing and building the new operation. The assets purchased included the IT and telecoms infrastructure required to support the ECAS operation and the costs of fitting out the three PSAPs.

Both fixed assets and set-up costs are categorised as CAPEX, and hence are depreciated over the contract life as stipulated in the CA. The depreciation of fixed assets and the amortisation of set-up costs are both taken into account when deriving annual costs of ECAS.

4.1.4.1 Set-up costs

The review of set-up costs was completed in the 2010 review by ComReg[5].

Set-up costs are incurred as BT made expenses to set up the new work centres for ECAS provision. The most important elements of set-up costs include:

- Third party call centre costs (the sub-contractor);
- BT Direct Labour costs: Base;

[5] HBC, Call Handling Fee Review for ComReg, 17 December 2010.

- BT Labour cost: Direct Support;
- BT Labour cost: Other Support Functions;
- BT Labour cost: Accommodation;
- BT Labour cost: Third party costs;
- Premises and related costs;
- Maintenance Costs;
- Network Services;
- Cost of Capital.

In general, set-up costs are only incurred at the beginning of ECAS operation.

Figure 20 gives the breakdowns of set-up costs as of Q2 2014/2015. The majority of set-up costs are from BT Direct Labour costs, which account for nearly a half of the total set-up costs.

Figure 20 - Breakdown of set-up costs as of Q2 2014/2015

Source: TERA Consultants analysis of BT's data

This year's review found that the set-up costs remain the same as was reported as last year and thus found them to be reasonable to be included in the CHF calculation.

4.1.4.2 Fixed assets

The review of the original fixed assets, purchased by BT mainly at the beginning of the contract to enable its operational activities for ECAS provision, was completed in 2010 by ComReg[6] and this year's review of these assets found that they remain the same since last year's review except for the additional CAPEX that BT proposed last year

During the calendar year to 31 December 2013, BT sought and obtained approval from ComReg for CAPEX on a number of additional items that were estimated to

[6] HBC, Call Handling Fee Review for ComReg, 17 December 2010.

cost €✂. Based on BT's submitted Quarterly Management Accounts[7], the resulting additional CAPEX amounted to only €✂. As a result, this additional CAPEX was taken into account for the CHF calculation instead of the originally proposed and estimated €✂.

More importantly, the review of fixed assets this year is focused mainly on a new proposal by BT to upgrade a number of components of the IT infrastructure in order to improve the SMS service and to upgrade the IT operating system. The paragraphs below explain and evaluate the validity of BT's proposal.

4.1.4.2.1 Additional CAPEX to address SMS length limitation

The original implementations of SMS communication and associated protocols placed a restriction of 160 characters on each individual SMS. This limitation per SMS exists to this day however smartphone and feature-phone platforms have implemented a standard allowing users to send SMS messages longer than 160 characters. This standard involves breaking the user's original (long) message into smaller individual SMS messages under 160 characters which are then transmitted as individual SMSs and re-assembled by the receiving device into a single message.

Multipart SMS operates for the most part invisibly and seamlessly for the end-user and to all extents and purposes the use of multipart SMS means that the original 160 character limitation is no longer an issue and users routinely send messages longer than 160 characters.

The Emergency SMS capability within the ECAS service was originally developed as a pilot service in 2012. At the time the pilot service was originally envisaged and designed, multipart SMS and long SMS messages were not in widespread use. Recent investigations by BT have revealed that the ECAS SMS interfaces and platform is not capable of handling multipart SMS messages or SMS messages in excess of 160 characters:

- SMS messages are currently truncated at the first message (potentially around 150 Characters is part 1 of multipart SMS is received).
- Potentially truncated SMS messages presents an operational risk to the service as vital information in and SMS may be "lost" with no indication to ECAS or the sender that the information was not received.

[7] ECAS Quarterly Management Accounts 30 June 2014 - Fixed Assets (Table 5)

In order to address this limitation and potential risk, a software change to the ECAS ✂ platform has been proposed by BT to allow SMS messages in excess of 160 characters to be handled by the platform.

Table 5 - BT estimates of software licenses and own costs for the SMS service upgrade

Software development and testing	Total
✂ SMS feature to allow messages > 160 Characters	✂

Source: BT

The review of the proposal notes that this is a relatively minor change which will be implemented under the normal ECAS change process. The costs associated with this change are limited to IT software development and testing efforts only. No additional service costs, i.e. BT staff costs, are anticipated.

As understood by TERA Consultants and Orbita, BT has sought and obtained approval from ComReg for this SMS service upgrade. As such, the associated CAPEX should be included in the CHF calculation.

4.1.4.2.2 Additional CAPEX for IT upgrade

As a number of components of the IT infrastructure are approaching end of life, BT has proposed an upgrade strategy that is meant to prevent possible disruption to ECAS should a problem occur.

The proposed upgrade is estimated to be €✂ of which €✂ is counted as part of the CAPEX for the upgrade and is discounted from the OPEX in BT pay costs. The resulting net IT upgrade is about €✂.

The proposal by BT was examined in details and was found to be reasonable in terms of the IT solution as well as costs. As such, the proposal was approved by ComReg and the costs of the IT upgrade was taken into account for the CHF calculations.

It should be noted that the total costs to be incurred by the BT ECAS resources for the upgrade, €✂ is counted as part of the CAPEX for the upgrade but is discounted from the OPEX in BT pay costs. These costs have therefore not been double counted in the calculation of the CHF.

4.2 Financial costs

In addition to the operational costs incurred by BT and reviewed in the previous section, BT incurs financial costs for the provision of ECAS. These financial costs are:

- **The Guaranteed Rate of Return.** This is the guaranteed rate of return which level is determined in Schedule 22 part 4 of the Concession Agreement. It is equal to 6.63% and should be applied every year to the Gross Book Value of fixed assets and set up costs related to ECAS[8] as detailed in previous sections. It therefore applies to the additional IT CAPEX described above.

- **The cost of the Sinking fund**. The Sinking Fund is designed to accumulate, over the term of the ECAS contract, sufficient funds to cover the loss to BT if revenues from the CHF are below reasonable costs incurred by BT (including cost of capital). The cost of this fund is €250,000 per annum.

- **The under-recovery from first quarters of ECAS operations and the under-recovery since last year's review**.

    - At the beginning of the Concession Agreement, the CHF was lower than it is today. It was equal to €2.23 per call up to February 2011. As the CHF was set too low because of the important decline in call volumes, BT incurred losses in the initial quarters.

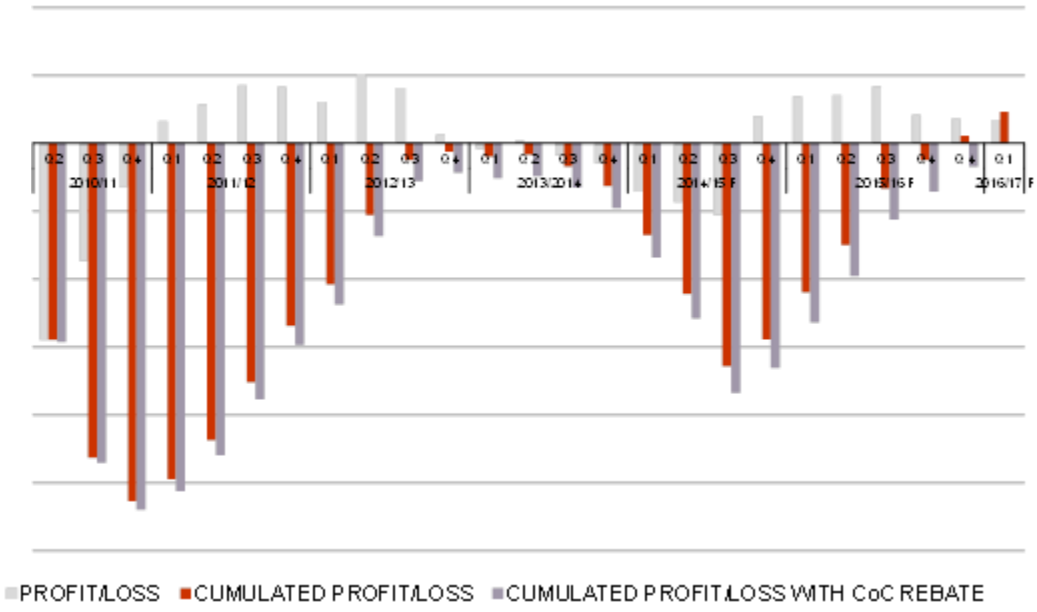
    - From early 2014, a trend emerged of actual call volumes that were considerably at variance from last year's forecast, reaching -26.1% with respect to the previous level for July 2013 (see sections 3.1 and 3.2 for explanation). Since the CHF is calculated based on a higher forecast volume, BT has been incurring losses.

    - These losses were taken into account in this year's CHF calculations to make sure that BT does not under-recover its costs. The CHF of this year will increase as a result.

[8] This is different from traditional approaches to calculate cost of capital where cost of capital is generally calculated as a percentage of the Net Book Value. This has been agreed in the Concession Agreement.

- **The interest related to the under-recovery**. The loss incurred by BT in early quarters obliged BT to incur financial costs to fund this loss. The agreed interest rate used to assess such costs is ✂%.

Figure 21 – BT's ECAS profits and losses over the contract duration (6 years) with the proposed CHF at €4.63 per call starting from 12 February 2015, considering volume forecasts and cost forecasts as described in previous sections



Source: TERA Consultants

4.3 Recommended CHF and sensitivity analyses

Once the operational costs, cost of capital and cost of the Sinking Fund and BT's ECAS revenues are calculated for each quarter, it is then possible to calculate the loss or gain for each quarter. This enables to calculate the under or over recovery in past quarters. In order to make sure that BT is exactly recovering its reasonable costs incurred for the provision of ECAS over the contract period, the discounted sum of under and over recoveries of each quarter must be equal to 0 at the end of the contract period, based on a previously agreed discount rate.

Such a calculation is therefore carried out to set the CHF that enables BT to recover its costs over the full contract period (including interests and past under-recoveries). **Using this approach, and adopting the highest rate of decline among the different scenarios in section 3.3, TERA Consultants proposes a CHF of €4.63 per call to be applied from February 2015 until February 2016**.

Generally speaking it is preferable to be pessimistic in terms of call volumes and choose the highest rate of decline among the scenarios because:

- If the call volumes turn out to be greater than expected, BT will over recover its costs but any over recovery will be then paid back to the contributing operators:
- If the call volumes turn out to be lower than expected, BT will under-recover its costs. The under-recovery can be compensated but the amount is constrained by the value of the Sinking Fund.

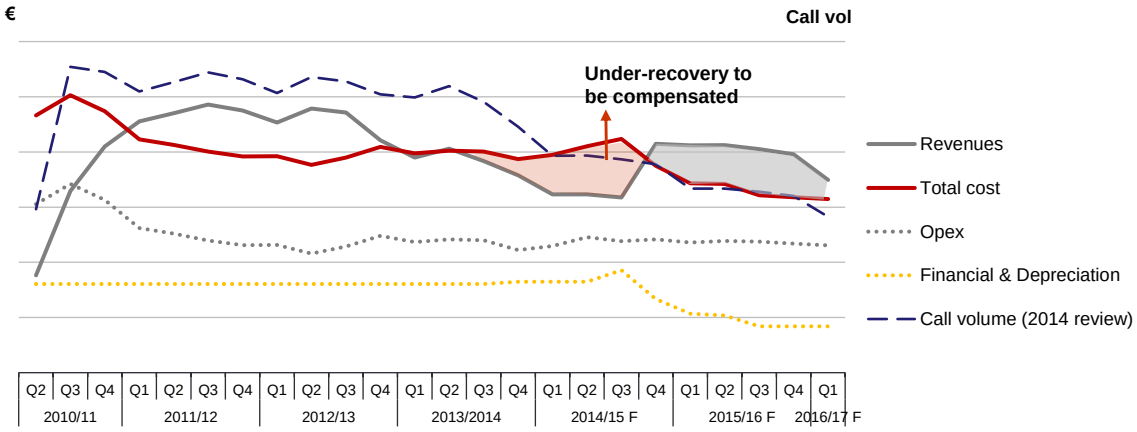
If the CHF were to be maintained at its current level of €3.08, BT would incur a loss of approximatively €✂ at the end of the 6 year contract assuming a Scenario 3 of call volume forecast. In theory, any loss or under-recovery would have to be made up for by the Sinking Fund, which by the end of the sixth year contract would have amounted to only €✂. As such, the CHF needs to be increased this year since the Sinking Fund would be short of making up for the under-recovery incurred by BT. Furthermore, there would be no other fund possible to offset the loss, neither there would be a transfer to a new operator under another contract. Nevertheless, for next year's review, it is important to analyse the real volume of calls at the time being and depending on reasonable costs effectively incurred by BT compared to the ones forecasted here, the CHF will need to be revised.

Mathematically, there are two main reasons as to why the CHF needs to be increased this year: the accelerated rate of decline in the number of calls to ECAS and the relative high proportion of fixed costs out of total costs incurred by ECAS regardless of call volumes.

Since real volumes observed over the last year are much lower than what was expected, BT has and will have recovered less from the CHF than what was planned for the period between February 2014 and February 2015. It is therefore necessary to increase the CHF to compensate this under-recovery.

Figure 22 below illustrates the history and forecast of ECAS costs, revenues and call volumes over the life of the contract. The period of under-recovery is marked in grey.

Figure 22 - Cost, revenues and call volumes over the life of the contract



Source: TERA Consultants analysis

Furthermore, as can be seen in Figure 22, as ECAS enters the end of the contract, the decline in call volumes is not closely followed by a similar decline in total costs. This is due to the fact that, even though the financial costs and depreciation charges have significantly gone down, primarily because most of the CAPEX has been depreciated/amortised by then, OPEX still remains stable. In fact, as analysed in section 4.1, Figure 13 and Figure 14, OPEX accounts for about ✂% or ✂ of ECAS in-life costs in Q1 2014/2015 but by the end of the contract, Q1 2016/2017, OPEX is forecast to take up ✂% of total in-life costs.

This level of OPEX is to be expected given that the ECAS operations need a minimum network capacity, as well as a minimum number of management staff and Operators to run the service and handle the calls respectively:

- At the beginning of the Concession Agreement, the BT's ECAS infrastructure was sized based on the volume at the time, which was about 4.8 million calls per annum. Even though the volume has dropped to approximately 2 million calls per annum, ECAS still needs to be able to cope with the peak volume in case of a widespread incident. Peak volumes over a 30 minute period could be said to be equivalent to 4.8 million per annum; and the infrastructure would need to be sized in order to be able to handle this.

- The number of management staff has been streamlined since the first review (a rationalisation programme was undertaken) and therefore even though the call volume will have declined much more than at the beginning of the contract, the level of management staff cannot be reduced to the same extent.

- As explained in section 4.1.1.2.1, BT is under contractual obligations of the Concession Agreement to have a minimum staffing considerations across the three sites 24x7, the number of Operators hour needed will have reached the minimum threshold that is contractually required to handle the ECAS calls, regardless of the actual level of call volumes.

As a result, even though the level of call volumes has lowered, total costs of ECAS are not declining significantly and it is still necessary to increase the CHF for the period between February 2015 and February 2016.

The analysis below gives a high-level estimate of the required increase in CHF to make up for the accelerated decline in call volumes.

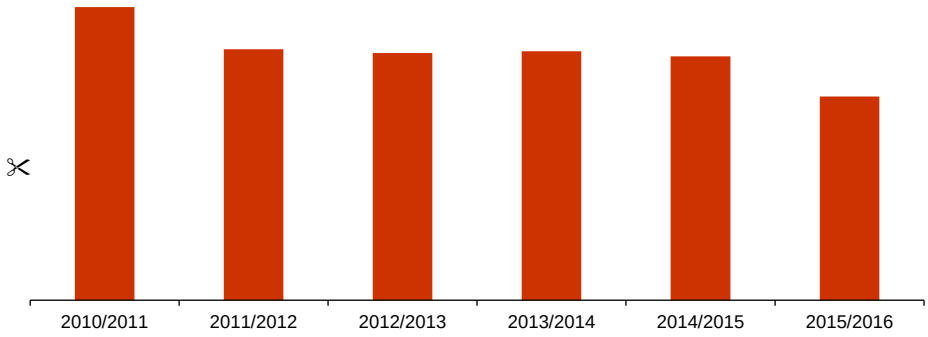
- Under-recovery due to fewer number of calls:
    - In the 2013 review, it was expected that the call volume would decline by only 3%, which assumes that the call volume between February 2014 and February 2015 to be a little over 2.6 million calls.
    - However, given the real number of calls to ECAS between February and August 2014, and a forecast fall of 21.2% of call volume between October and December 2015 (Scenario 3 forecast), and another fall of 15.2% for January 2015, the number of calls between February 2014 and February 2015 would be only around 2.13 million.
    - This equals to an under-recovery of more than €✂ for BT during the said period.
- BT therefore needs to recover, in addition to its usual ECAS costs, the €✂ of under-recovery detailed above and the nearly €✂ for the new CAPEX (net IT upgrade and SMS length limitation), giving a total of nearly €✂ to be recovered in addition to usual charges (i.e. the current CHF should cover the usual charge if the call volume declines by 3% as assumed)
- The number of calls between February 2015 and the end of the 6-year contract is calculated to be about 2.5 million based on a scenario 3 assumption.
- Overall, this means that the CHF will need to be increased by around €✂ (€✂ divided by 2.5 million calls), giving a CHF of €✂, just to make up

for the under-recovery incurred between February 2014 and February 2015 and the new CAPEX.[9]

Another increase by €✂ to the CHF is needed to reach the calculated €4.63, which could largely be explained by the impact of high fixed costs uncorrelated with the change in call volume as shown in Figure 22 and the continued decline in call volumes during the rest of the contract.

Nevertheless, it should also be noted that despite the high proportion of fixed cost, the overall cost of the ECAS operation (excluding compensations for over or under-recoveries) has been declining and will continue to decline, as shown in Figure 22 or Figure 23 below.

Figure 23 - Total costs since the beginning of the ECAS operation (excluding compensations for over or under-recoveries)



Source: TERA Consultants analysis

Since the CHF is calculated to enable BT to recover the total costs of the ECAS operation, the overall contribution to ECAS from the electronic communications operators should follow the pattern in Figure 23 if no under or over-recovery has taken place. The under or over-recovery would only change the financial contribution from electronic communications operators from one year to another.

Furthermore, **even though the CHF will increase for the upcoming period, the total number of calls made to ECAS will be lower. Therefore, the impact of the increase in CHF will not have a similarly important impact on the payment required from electronic communications operators for ECAS.** This is true for the total payment to ECAS (or total revenues of ECAS) as well as for the payment from each electronic communications operators as can be seen

[9] If the same analysis applies to a 7-year contract, an increase of €✂ would be required to make up for the under-recovery and the new CAPEX.

from Figure 24 below, since the share of calls to ECAS from each operator remain stable[10].

Figure 24 - Breakdowns of calls to ECAS from different telecommunications operators

✂

Source: BT

Based on the total costs and the breakdowns of call volumes from each operator, the financial contribution to ECAS each year is estimated to be as shown in Figure 25. The proportion of call volumes and the subsequent estimated financial contribution of each operator is based on the number of calls to ECAS from each network in September 2014. Based on Figure 25, it can be seen that between February 2014 and February 2015, the operators' financial contributions (in pink) are much lower than what they should have been (in grey) because the number of calls turn out to be much lower. The difference between these is much smaller than the increase in the financial contributions due for February 2015 and February 2016 at a CHF of €4.63.

Figure 25 - Estimated financial contribution to ECAS operation by electronic communications operators

✂

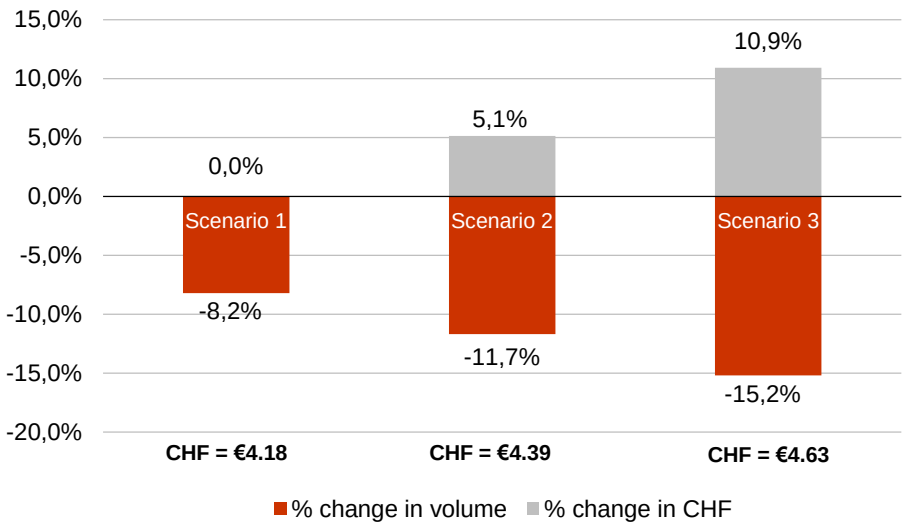
Source: TERA Consultants analysis

Based on the analysis of forecast call volumes for 2015 and onwards (section 3.3), the three scenarios of call volume change defined in section 3.3 were used and the associated CHF was calculated. The impact of the change in volume on the CHF is shown in Figure 26, where changes in volumes and the resulting CHFs are compared.

TERA Consultants has used the baseline scenario to calculate the CHF, based on the reasoning of section 3.3 ("Baseline Scenario 1").

[10] The peaks of number of calls from Eircom network are mostly results of damage from bad weather, hence the following decrease thanks to remediation work after BT's notification to Eircom about the faulty lines.

Figure 26 – Cost volume relationship: 6 year contract



Source: TERA Consultants

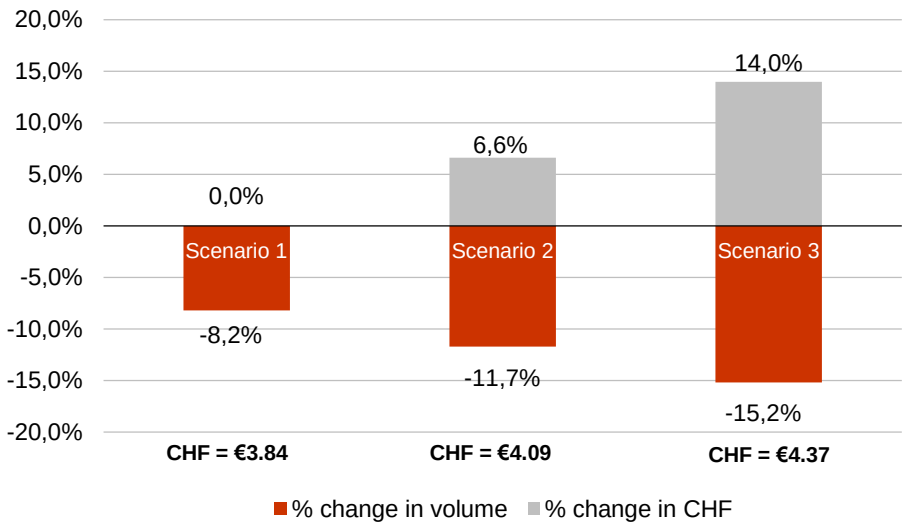
NB: this graph shows how CHF changes with different assumptions of the growth rate of call volume. The base assumption is a -8.2% growth rate of call volume at which the CHF is calculated to be €4.18.

Figure 27 below shows the same cost volume relationship but for a 7 year contract, assuming that the current contract will be extended for a further year, which is the maximum allowed under the Concession Agreement. Again, the changes in volume and in CHF are not linear.

If the contract were to extend for two years, the CHF would need to be fixed at €4.37, less than the €4.63 under the current one year extension, but still much higher than the current CHF of €3.08. This is because the CHF still needs to increase to make up for the under-recovery and the IT upgrade (an addition of €✂ to the CHF). Furthermore, even if the two year extension would allow BT to recover more revenues through a higher number of total calls during the extension, the 2nd year extension still means BT would need to incur costs for running ECAS that cannot be lowered as much as the fall in the call volumes and associated revenues.

Therefore, even with a two year extension, the CHF would need to be at a much higher level than it is today.

Figure 27 - Cost volume relationship: 7 year contract



Source: TERA Consultants

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