

**Report for ComReg**

**Study into the Call  
Handling Fee associated  
with the Emergency Call  
Answering Service  
(ECAS)**

*18 October 2013*

**Ref: 38026-363v03 (redacted)**

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***Note on redaction:***

Please note that due to commercial confidentiality some parts of this report have been redacted for publication. These are marked by this symbol: ✂.

# 1 Executive summary

Following the completion of a formal public procurement process, in 2009 the Department of Communications, Energy and Natural Resources (DCENR) awarded a contract to BT Ireland (“BT”) to provide the Emergency Call Answering Service (“ECAS”) on behalf of the state of Ireland. The Concession Agreement (“CA”) that is in place will see BT Ireland operate the service until July 2015.

All calls made to 999/112 are free of charge to the caller, as required by European Union legislation. In order to recover the cost of running the ECAS operation, BT charges a call handling fee (“CHF”) to operators for calls which originate on their networks.

In August 2013, ComReg appointed Analysys Mason to conduct a review of the current CHF.

A number of parameters influence the calculation of the CHF:

- call volume (the number of calls made to the ECAS)
- in-life costs (day-to-day costs of running the ECAS operations)
- finance costs (costs associated with financing the project over the term of the CA).

As the CHF calculation relies upon forecast call volumes to calculate the potential revenue generated from ECAS calls and the costs associated in providing the operational capacity to handle these calls, call volume is an important parameter. In examining the cost categories, particular attention was paid to:

- the actual costs borne by BT since the last CHF review to determine if they are reasonable
- the projected costs, to contract end, to determine if they represent a reasonable estimation of likely costs which will be incurred.

Having completed a review and consultation, ComReg determined that the CHF to be applied from 12 February 2013 to 11 February 2014 was EUR2.93 per call.

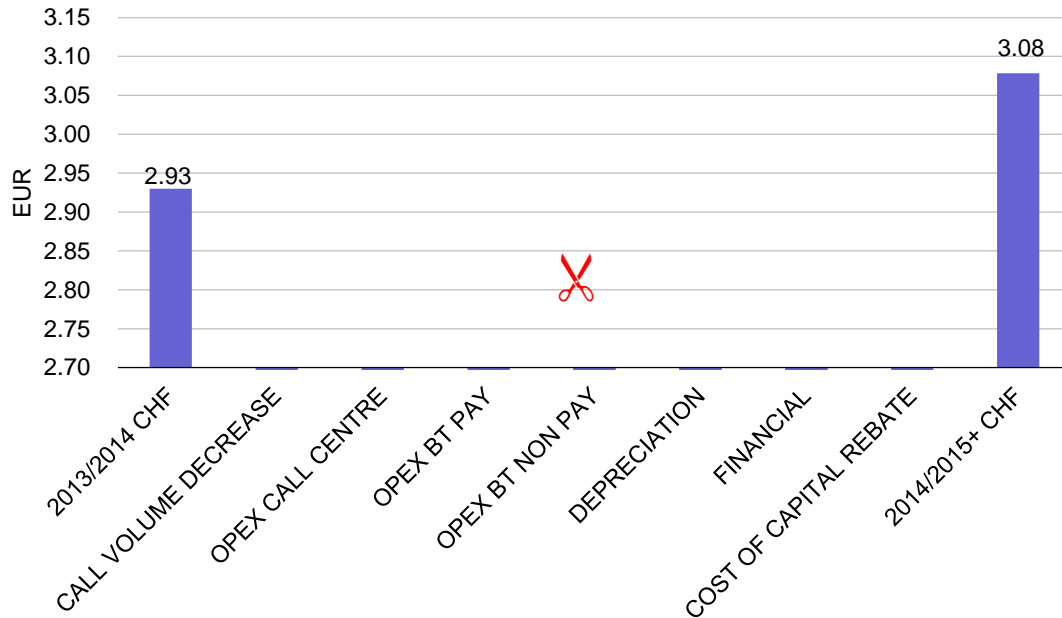
Analysys Mason proposes a CHF of EUR3.08 per call should be applied from February 2014.

The main reason for the change in the CHF from the previous period is due to actual volumes observed over the last year being lower than expected, which resulted in BT recovering less from the CHF than was planned. Furthermore, the call volume decline over the remaining contract period is now anticipated to be greater than was previously forecast. It is therefore necessary to raise the CHF, both to compensate under-recovery in the previous period and to avoid continued under-recovery in the remaining contract period.

Counteracting the effect of the decrease in call volumes is a slight net reduction in in-life costs. Although some of the costs that BT is allowed to recover have increased (i.e. BT pay and

depreciation charges), this is more than offset by reductions in other areas (i.e. call centre<sup>1</sup> and non-pay costs). Financial costs remain as forecast in the previous period. Finally, the cost of capital rebate due to BT is forecast to increase slightly, which means less revenue needs to be recovered through the CHF. An illustration of the incremental impact of each of these changes on the CHF is shown below.

Figure 1.1: Overview of change from last year's review [Source: Analysys Mason, 2013]



As part of the overall review, Analysys Mason also conducted an operational review of the ECAS. Our main observations and findings can be summarised as follows.

- The ECAS organisational structure and resource levels represent best practice for such a critical requirement. However, on the assumption that future call volumes will continue to decline, staffing levels must be regularly reviewed.
- With respect to call handling, it was noted that silent calls represent a significant number of all calls to the ECAS. The identification of more efficient ways of dealing with silent calls could have a significant impact on the average call handling time and we suggest this should be a future consideration in relation to the provision of the ECAS. Other developments such as the ability to transfer electronic case data (Type C calls) might also be expected to lead to reduced call handling times.
- Increased levels of call quality reviews and the linking of the results of the reviews to operator bonus are understood to have had a positive impact (improvement) on the quality of ECAS call handling.

<sup>1</sup> Call centre operator hours reduce in line with forecast call volumes.

We also considered how technological advances are changing the way in which people communicate today. As a result Public Safety Answering Points (PSAPs) must become more able to deal with the increasing use of technologies such as voice over IP (VoIP) and other multi-media forms of communication.

Other challenges that the future ECAS will need to consider include the availability of improved accuracy in relation to caller locations for calls originating on mobile networks, and the adoption of proposals for the roll-out of eCall by the EU Commission.

## 2 Introduction

### 2.1 Background

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

All calls made to 999/112 are free of charge to the caller as required by European Union legislation. In order to recover the cost of running the ECAS operation, the ECAS operator charges a call handling fee (“**CHF**”) to operators for calls which originate on their networks.

Following the completion of a formal public procurement process, in 2009 the Department of Communications, Energy and Natural Resources (DCENR) awarded the contract to BT Ireland (“**BT**”) to provide emergency call answering services on behalf of the state of Ireland. The Concession Agreement (“**CA**”) that is in place will see BT Ireland operate the service until July 2015.

### 2.2 ECAS operation

BT uses three ECAS centres to provide emergency call answering services. These centres are also known as Public Safety Answering Points (PSAPs) and are in the following locations:

- Navan, Co. Meath
- Ballyshannon, Co. Donegal
- EastPoint Business Park, Dublin 3.

In addition to the PSAPs, two Equipment Centres are used to host the ICT infrastructure that is required to support the ECAS operation. The Equipment Centres, located in CityWest (Dublin) and Navan are configured in a resilient manner to support the provision of 99.999% availability in relation to ECAS.

### 2.3 Annual review of CHF

Under Section 58D (i) of the Communications Regulation Act 2002 as amended (“the Act of 2002”), ComReg is required to:

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*“Not later than 2 months before the second anniversary of the date on which an ECAS contract was entered into, and not later than 2 months before each subsequent anniversary of that date while the contract remains in force, [...] conduct a review of the maximum permitted call handling fee that the ECAS operator can charge for handling emergency calls.”*

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Following this review, and if deemed necessary by ComReg, the CHF can be adjusted with the adjustment taking effect at a set date.

Having completed a review and consultation, the CHF to be applied from 12 February 2013 to 11 February 2014 was set at EUR2.93 per call.

## 2.4 Review of CHF for period from February 2014 to February 2015

In August 2013, ComReg appointed Analysys Mason to conduct a review of the current CHF.

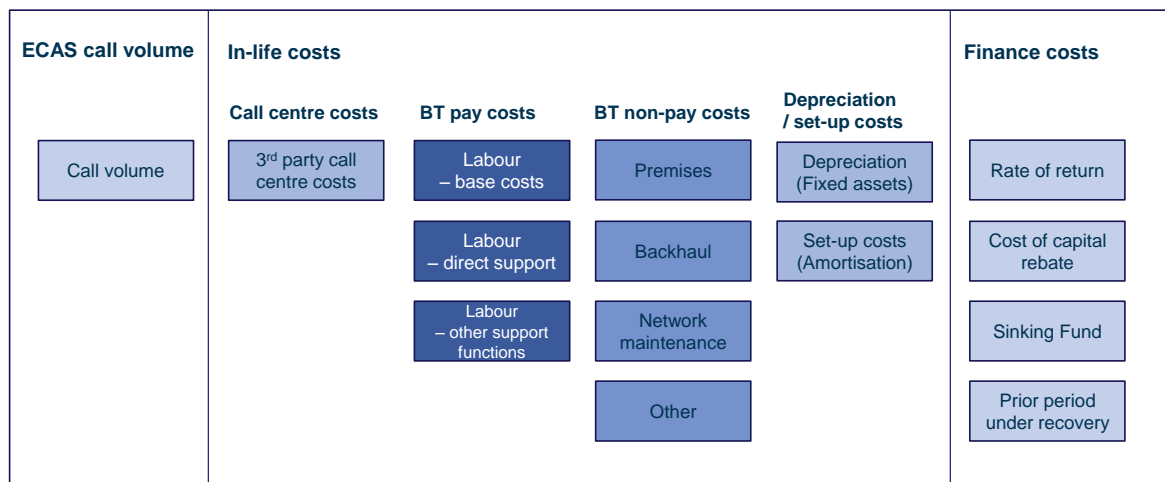
Following this review, and if considered necessary by ComReg, the CHF can be adjusted with the adjustment taking effect on 12 February 2014 and applicable for the following 12 months.

### 2.4.1 Methodology

A number of parameters influence the calculation of the CHF. These can be categorised as shown in Figure 2.1.

- call volumes (the number of calls made to the ECAS)
- in-life costs (day-to-day costs of running the ECAS operations)
- finance costs (costs associated with financing the project over the term of the CA).

Figure 2.1: Parameters influencing the calculation of the CHF [Source: Analysys Mason, 2013]



An analysis of call volumes was completed primarily in order to forecast future trends. As the CHF calculation relies on forecast call volumes to calculate the potential revenue generated from ECAS calls and the costs associated in providing the operational capacity to handle these calls, call volume is an important parameter.



In examining the cost categories, particular attention was paid to:

- the actual costs borne by BT since the last CHF review to determine if they are reasonable
- the projected costs, to contract end, to determine if they represent a reasonable estimation of likely costs which will be incurred.

The call volume data and cost analysis was then used to calculate the maximum permitted CHF required, having regard to the right of the ECAS provider to recover its reasonable costs, and a guaranteed rate of return, pursuant to Section 58(D)(3)(a) of the Act of 2002.

## 2.4.2 Information gathering

### *Financial information*

All relevant information, to enable the assessment of the cost categories highlighted in Figure 2.1, was provided by BT Ireland.

### *Site visits and key stakeholder consultations*

Analysys Mason also conducted a number of site visits and interviews with key individuals within the ECAS organisation. The programme of site visits and the consultations completed are as detailed in Figure 2.2 below.

Figure 2.2: Site visits and consultations [Source: Analysys Mason, 2013]

Site/location	Function/role	Key stakeholder consultations	Date visited
Navan	PSAP and Equipment Centre	Head of Operations First Line Manager Lead First Line Manager Senior Service Engineer	03 September 2013
Belfast (NI)	BT Managed Services Centre	Senior Service Engineer Head of Operations BT Shared Services Centre resources	05 September 2013
EastPoint	PSAP	Head of Operations First Line Manager Lead First Line Manager Senior Service Manager Service Coordinator Resource Manager Lead Operator Operators	16 September 2013

## 2.5 Document structure

The document is structured as follows:

- Section 3 considers the trends in ECAS call volume
- Section 4 considers the operational costs incurred
- Section 5 considers the capital expenditure and financial costs incurred
- Section 6 presents our conclusions, and presents the recommended CHF for the next period, along with a sensitivity analysis.
  
- Annex A presents the findings of our operational review
- Annex B sets out some of the future technology challenges for the ECAS operation
- Annex C lists the quantitative and qualitative performance metrics for the ECAS operation as set out in the CA.

### 3 ECAS call volume

In this section of the report, we have analysed the past trends in relation to calls made to ECAS and have used this data to identify the possible trends in relation to future call volumes.

As the CHF calculation relies on forecast call volumes to calculate the potential revenue generated from ECAS calls and the costs associated in providing the operational capacity to handle these calls, call volume is an important parameter which must be considered carefully.

#### 3.1 Historical trend

The historical trend in call volume, as shown in the following charts can be characterised by two distinct phases. The first phase, to early 2011, showed a significant decline in the number of calls received. It has since been discovered that the higher volume of calls in this earlier period was largely due to erroneous emergency calls caused by line faults in the eircom and other operator networks. The number of calls since then reflects the remedial work completed to alleviate these faults.

Figure 3.1: Historical call volume trend (Q4 2007/08 to Q1 2013/14) [Source: eircom pre-July 2010 data, BT post-July 2010 data, 2013]

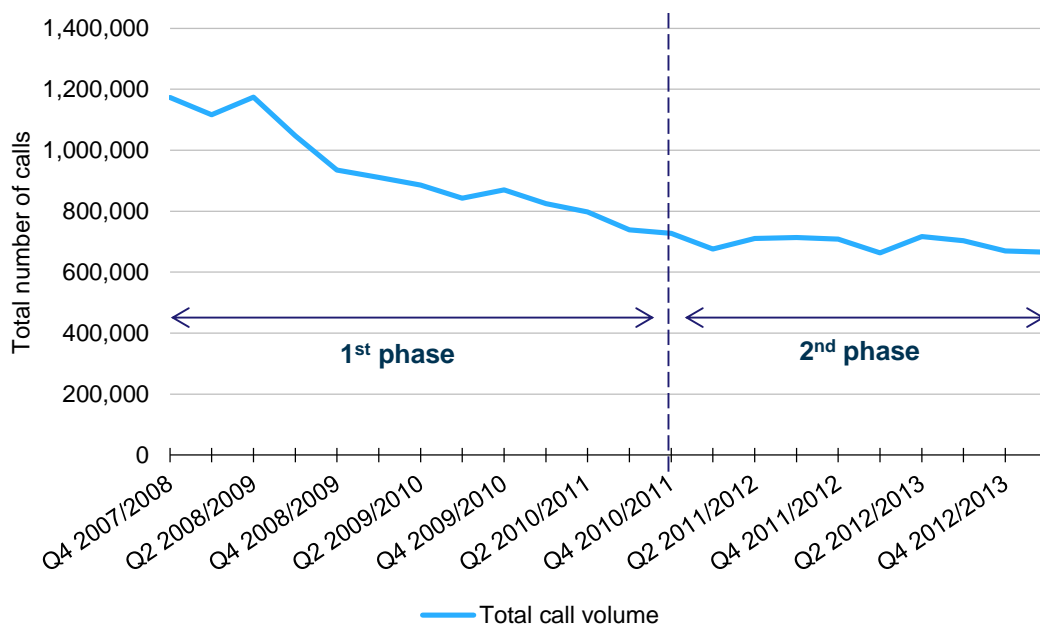


Figure 3.2: Call volume – Q4 2007/08 – Q4 2010/11 (first phase) [Source: eircom pre-July 2010 data, BT post-July 2010 data, 2013]

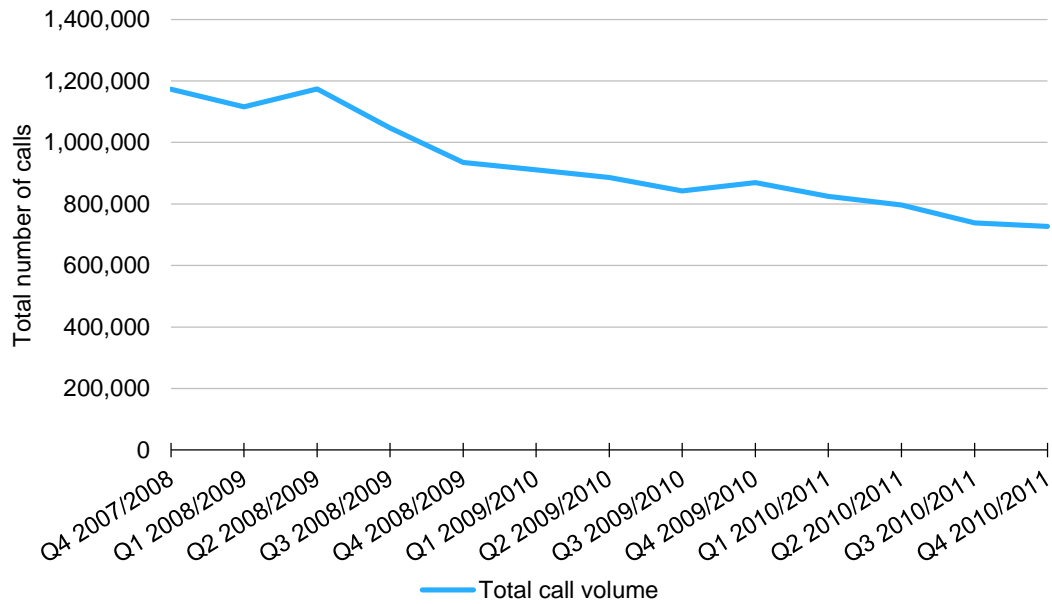
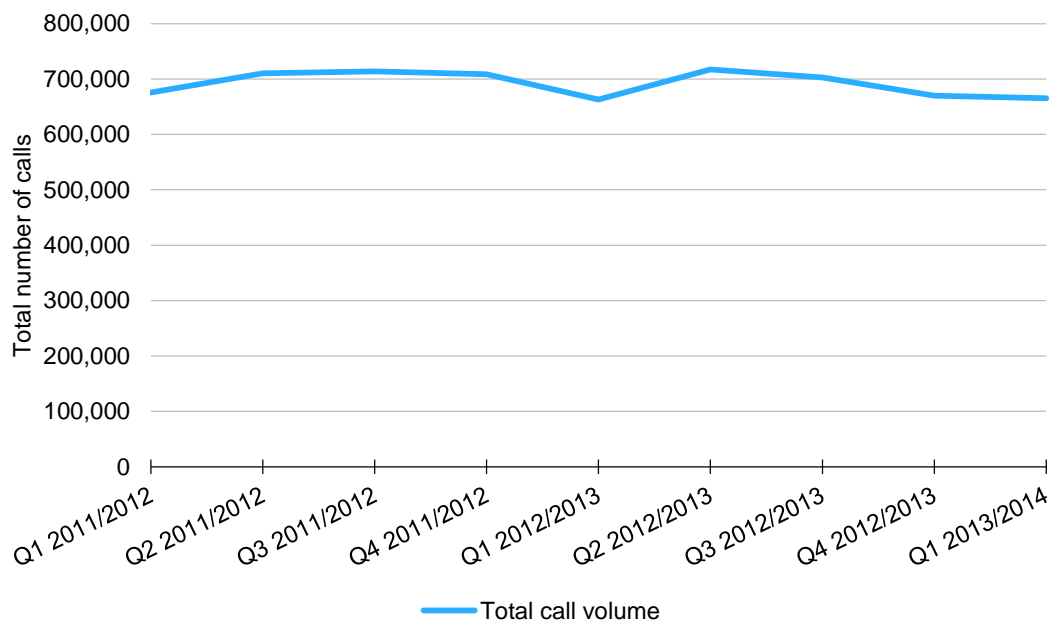


Figure 3.3: Call volume – Q1 2011/12 to Q1 2013/14 (second phase) [Source: BT, 2013]



### 3.2 Previous forecast call volume

Understandably, last year's forecast was based on the second phase of the observed historical trend, from Q1 2011/12 onwards, where the decline in call volumes is less pronounced. The initial overall assumption was a net annual decline of  $-2.5\%$ <sup>2</sup>, based on  $1.5\%$  population growth<sup>3</sup> and an annual volume of calls forecast of  $-4\%$ . This was subsequently revised to a net annual decline of  $-2.0\%$  as a result of the actual call volumes for October and November 2012 becoming available and their inclusion in ComReg's final calculations<sup>4</sup>.

However, the revised net annual growth forecast of  $-2.0\%$  still underestimated the actual rate of decline. As Figure 3.4 shows, the number of calls has decreased at an average rate of just over  $-3.0\%$  during the period from October 2012 to September 2013.

Figure 3.4: Call volume comparison (October 2012 to September 2013) [Source: BT, 2013]

Month	2011	2012	2013	Difference (%)
October	249,962	244,059		-5,903 (-2.4%)
November	226,757	224,342		-2,415 (-1.1%)
December	248,781	234,960		-13,821 (-5.6%)
January		245,126	230,372	-14,754 (-6.0%)
February		222,636	212,139	-10,497 (-4.7%)
March		241,281	230,024	-11,257 (-4.7%)
April		231,510	225,073	-6,437 (-2.8%)
May		222,724	219,687	-3,037 (-1.4%)
June		221,589	220,439	-1,150 (-0.5%)
July		241,584	246,054	+4,470 (+1.9%)
August		247,813	236,147	-11,666 (-4.7%)
September		224,782	<b>210,313</b>	<b>-14,469 (-6.4%)</b>
	<b>Total (Oct 11 – Sep 12)</b>	<b>2,824,545</b>		
		<b>Total (Oct 12 – Sep 13)</b>	<b>2,733,609</b>	<b>-90,936 (-3.2%)</b>

### 3.3 Forecast for new CHF calculation

On the basis of the most recently observed trends, it would appear reasonable to base the new CHF calculation on a continued call volume decline of  $-3.0\%$ . This net annual growth rate is subjected to a sensitivity analysis in Section 6, where the impact of each of the following scenarios on the CHF is considered in more detail.

<sup>2</sup> Recommendations for a Reasonable Call Handling Fee (CHF) associated with the Emergency Call Answering Services (ECAS), TERA Consultants, October 2012

<sup>3</sup> <http://www.cso.ie/en/media/csoie/releasespublications/documents/population/current/poppro.pdf>

<sup>4</sup> See ComReg Document 13/03

- 0% decline in the volume of calls
  - an unlikely scenario, but included for reference purposes
- -1.1% decline in the volume of calls
  - actual decline reported 2012 versus 2011, but does not reflect more significant recent declines
- -2.0% decline in the volume of calls
  - forecast decline in last year's review, which underestimated actual rate of decline
- -3.0% decline in the volume of calls
  - scenario upon which the new CHF calculation is based
- -3.5% decline in the volume of calls
  - moderate increase in forecast decline
- -5.0% decline in the volume of calls
  - significant increase in the forecast decline.

## 4 In-life costs

In this section, we review the in-life costs, or operational costs, incurred by BT. For the purposes of this report, these costs are categorised as follows:

- call centre staff costs (third-party costs, as a specialist call centre company provides the call centre staff)
- BT pay costs
- BT non-pay costs.

The breakdown of these costs is illustrated in Figure 4.1. Depreciation and amortisation of deferred set-up costs are included as in-life costs, as these are annual costs associated with the running of the assets.

*Figure 4.1: Breakdown of operational costs*  
 [Source: BT Quarterly Management Accounts (QMA), Q42012/13]



The primary source of information for this section of the report is the *BT Quarterly Management Accounts (to Q1 2013/14)*. Additional cost analysis and supplementary material was provided during the course of the review.

Certain elements of the call centre staff costs and BT pay costs have varied since the commencement of the ECAS operation. These variations were mainly due to a reduction in the hourly rate paid for Customer Service Representative (CSR) operators, a reduction in the number of CSR hours required (through the implementation of changes to forecasting), the refinement of the ECAS organisational structure, and a more steady state being achieved with respect to specialist engineering requirements.

## 4.1 Call centre costs

CSR costs relate to the staffing of the three PSAPs. There are approximately 70 CSRs, comprising part-time and full-time staff. This cost forms a substantial part of the in-life costs of the ECAS operation.

The ECAS provider uses an industry standard ‘Erlang’ resourcing model to determine the number of CSRs it requires across each of its PSAPs. By applying a set of performance metrics to the estimated call volumes, a minimum number of CSR hours is forecasted. The ECAS provider also has a health and safety policy of having a minimum of two CSRs present on each site at any one time. This is to allow for breaks, to ensure that the work environment is safe (particularly late at night), and to allow CSRs time to recover if they have taken especially stressful calls.

Once the ECAS provider has determined the number of CSR hours it requires, the particular individuals are rostered by a specialist third-party call centre company. All CSRs are employed directly by the specialist call centre company. None are employed directly by the ECAS provider.

The specialist call centre company charges the ECAS provider an hourly rate for each of the CSRs it rosters. Included in the hourly rate are the following main cost components:

- basic pay, including bonus and employers PRSI
- an allowance for ‘unavailable hours’<sup>5</sup>
- overheads associated with providing the ECAS service
- general overheads.

To assess whether the call centre costs paid by BT to the specialist call centre company are reasonable, it is necessary to consider two aspects:

- the cost per CSR hour
- the workforce management techniques applied, and the resulting operator hours required to handle the call volume.

This year’s review, like previous years, examines each of these two aspects. In addition, an operational review of the PSAPs was also conducted. Details of the operational review and its findings are listed in Annex A.

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<sup>5</sup>

Unavailable hours allow for off-phone activities such as training, meetings, breaks etc.



#### 4.1.1 Third-party call centre hourly rate

The hourly rate paid by BT to the specialist call centre company is constructed from the cost components as set out in Figure 4.2.

Cost component	Hourly rate (EUR)
Basic salary of CSR (c. EUR20,000 per annum)	10.50
Performance bonus (10%)	1.05
Employers PRSI (10.75%)	1.24
	12.79
Churn <sup>6</sup>	✂
	✂
Uplift for unavailable hours	✂
Resourcing	✂
Call centre coordinators	✂
Trainers	✂
Recruiters	✂
Agency and recruitment	✂
	✂
General overhead <sup>7</sup>	✂
	✂
Rate of return to specialist call centre company (✂%)	✂
	✂
Variance in hourly rate <sup>8</sup> (✂%)	✂
<b>Total</b>	<b>28.07</b>

Figure 4.2: Specialist call centre company hourly rate cost categories  
[Source: BT, 2013]

ComReg has previously conducted a thorough analysis of the costs components used to calculate the hourly rate. The review carried out in 2011 directed a significant reduction in the hourly rate from EUR34.72 to EUR28.07, the equivalent of a 19% decrease.

Having reviewed the make-up of the cost components and considered the relevant analysis already conducted by ComReg, Analysys Mason is of the view that an hourly rate of **EUR28.07** continues to be reasonable. As the basic salary of a CSR, the basis upon which the hourly rate is determined has remained relatively unchanged in the job market over recent periods. We also note there should be no wage inflation applied to the hourly rate in the CHF calculation.

<sup>6</sup> Churn relates to the costs associated with the general disruption when CSRs resign from their positions.

<sup>7</sup> BT leases premises from which it operates two of its PSAPs. In addition, it uses space within the premises of the third-party specialist call centre company for its third PSAP (EastPoint Business Park). The associated costs of this third PSAP are contained within the general overhead rate it pays the specialist call centre company.

<sup>8</sup> ✂.

#### 4.1.2 Workforce management and number of operator hours

For ECAS, the activities related to workforce management are conducted by both BT and the specialist call centre company, as detailed in Figure 4.3 below.

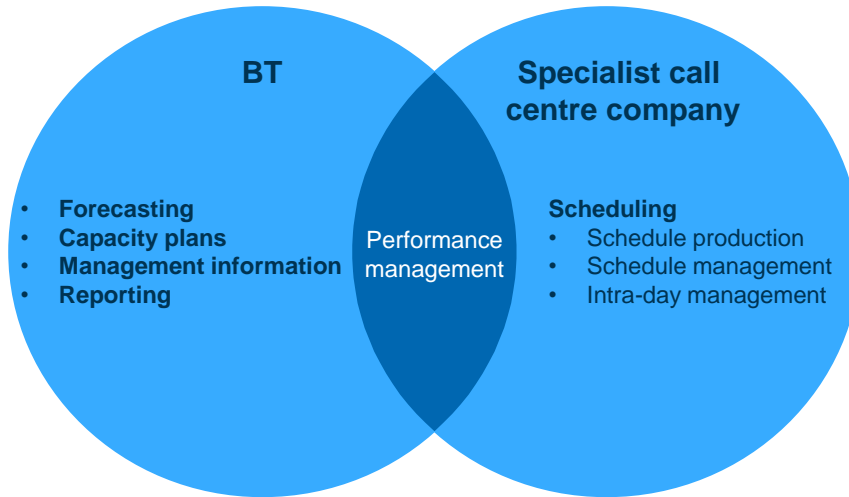


Figure 4.3: Workforce management activities  
[Source: BT and specialist call centre company, 2013]

A description of how each of the activities is performed has been provided in the following sections.

##### *Forecasting and capacity planning (BT activity)*

Forecasting and capacity planning for ECAS is completed by BT. The level of forecasting performed by BT can be categorised as ‘Medium Term’<sup>9</sup> forecasting in that each time a forecast is developed, it is produced a number of weeks in advance and only relates to an upcoming calendar month. For ECAS, BT produces monthly forecasts approximately six weeks in advance.

Inputs into the monthly forecasts leading to the identification of the operator requirement for the upcoming period include the following:

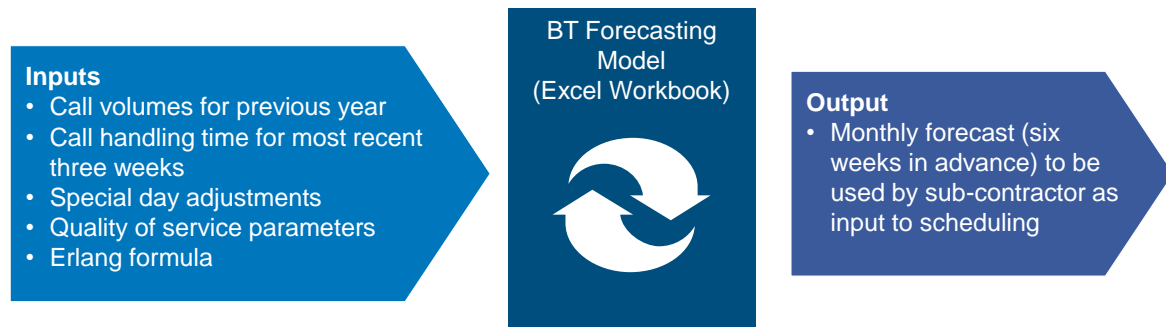
- historical data such as the previous year’s call volumes along with recent call handling metrics
- call handling time for the most recent three weeks
- special day adjustments
- contractual service parameters
- associated industry standard formula (Erlang).

When completed, the BT forecast/capacity plan is provided to the specialist call centre company to be used as the input to its scheduling activities. The detail provided to the company identifies the number of operators required by 15-minute intervals for the required period (one month) and is broken down by location (Navan/Ballyshannon/EastPoint).

<sup>9</sup> As opposed to ‘Long Term’ where demand forecasts for a full year are produced and reviewed/updated monthly or ‘Short-Term’ where intra-day re-forecasts are conducted.

An overview of the forecasting and capacity planning activities as conducted by BT is provided in Figure 4.4 below.

Figure 4.4: Forecasting and capacity planning activities [Source: Analysys Mason and BT, 2013]



The methodology applied by BT in relation to the forecasting and capacity planning activities is unchanged from the previous year.

For an operation such as ECAS and from the information obtained during the site visits, it is the view of Analysys Mason that the approach taken by BT in relation to ‘Medium Term’ forecasting and capacity planning is still appropriate for this review period.

► *Forecast versus actual for most recent reporting period*

It is understood by Analysys Mason that although forecast accuracy is being monitored by BT, it is not formally reported to ComReg. It is further understood that BT measures forecasting accuracy on a daily, weekly and monthly basis while also noting any issues/activities that may be the reason for any differences between forecasts and actual.

*Schedule production and management (specialist call centre company activity)*

A dedicated resource (forecaster) within the specialist call centre’s organisation is tasked with the production and management of the operator resource schedule.

The forecaster uses an industry standard application, eWorkforce Management (eWFM), to create an Intra-Day Performance (IDP) for each day of the BT forecast. The inputs to the eWFM application include the following:

- the output from BT’s forecasting and capacity planning exercise
- the application of the agreed shrinkage allowance for ‘off-phone’ activities such as coaching and feedback, refresher training, one-to-ones and other meetings as well as paid breaks
- the current shrinkage allowance, which has been agreed at  $\times\%$ , a decrease from  $\times\%$  with effect from January 2013.

The resulting output from eWFM represents the operator hours that are chargeable to BT.

It should be noted that in addition to the allowable shrinkage rate of  $\times\%$ , the specialist call centre company applies a further shrinkage allowance of  $\times\%$  to allow for sickness, annual leave, other absence, coaching and meetings. This additional  $\times\%$  is added by the specialist call centre company to ensure that it is able to meet its contractual obligations and is not charged to BT or the ECAS operation.

► *Intra-Day Performance and rota development*

Having identified the IDPs, the specialist call centre company is then required to develop the rotas to assign actual agents to meet the requirement. The completion of the rotas is a manual process using MS Excel.

In the development of the rotas, the specialist call centre company is also required to take into account the following requirements.

- One lead operator must be scheduled in one of the three centres at all times.
- The lead operator in the lead centre will be off-line at all times.
- There must be a minimum of two agents scheduled and on-line in each centre at all times.
- Shifts are broken down as follows:
  - days
  - evenings
  - nights
  - part-time.

In relation to the recruitment of operators for the ECAS operation, it is understood by Analysys Mason that one of the requirements that the specialist call centre company generally seeks is candidates that are “fully fluent in English and preferably also in the Irish language”.<sup>10</sup> This approach ensures that calls received from callers using the Irish language can be dealt with using an internal transfer to an operator who is proficient in both English and Irish.

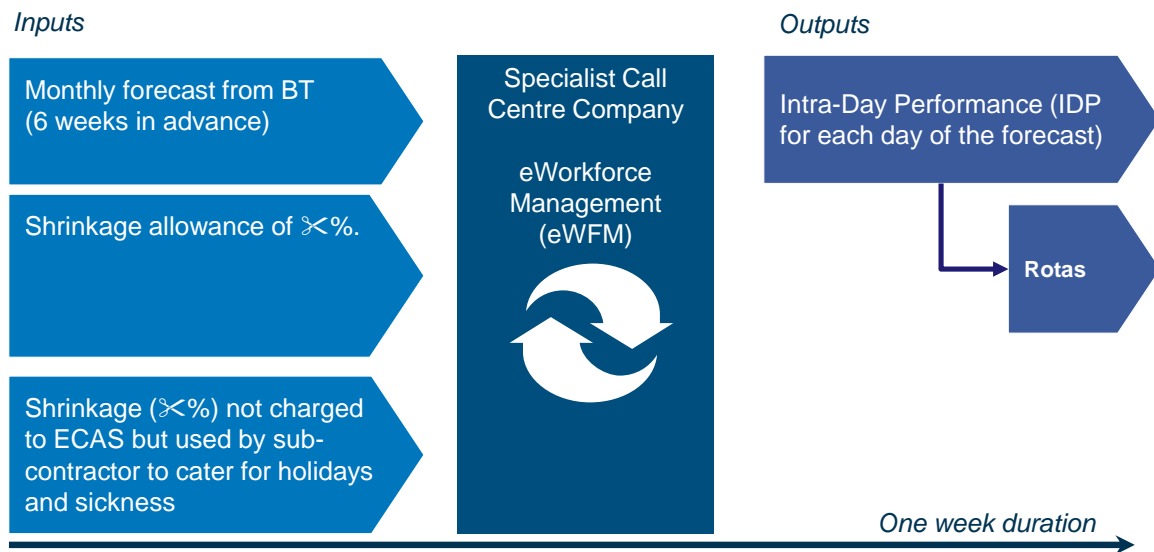
At the conclusion to the process, the completed rota is sent to each of the three Service Coordinators for review. Following a review by the Service Coordinators, the rotas are forwarded to the agents. At this stage of the process a copy of the rota is sent to BT for its records. Agents are typically provided with their rotas three weeks in advance. The entire process as described above is conducted over a working week.

An overview of the entire scheduling process is provided in Figure 4.5.

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<sup>10</sup> Source: [www.irishjobs.ie](http://www.irishjobs.ie)

Figure 4.5: Scheduling process [Source: Analysys Mason and specialist call centre company, 2013]



► *Intra-day management*

In the event of a sudden sickness or unavailability of an operator or operators, the IDP developed for the required period is revisited to confirm if service levels can still be met by application of whatever remediation plan is to be considered.

In the event that additional resources are required, the specialist call centre company can avail of an ‘on-call rota’ for the provision of additional resources.

With the exception of an agreed X% reduction in the shrinkage allowance since 01 January 2013, the methodology applied by the specialist call centre company in relation to schedule production and management activities is unchanged from the previous year.

For an operation such as ECAS and from the information obtained during the site visits, it is the view of Analysys Mason that the approach taken by the specialist call centre company in relation to scheduling activities for the ECAS operation is still appropriate for this review period.

*Management information and reporting (BT activity)*

The core component of the ECAS system is the X platform. Additional applications used to support the management information and reporting requirements include the following:

- SQL server (database hosting)
- Microsoft (MS) SharePoint (supporting document management and access to SQL reports)
- MS Office applications such as Excel for the manual production of reports.

First Line Managers (FLMs) have access to historic management information. Reporting requirements are met using the information obtained from the core systems and supporting applications to develop MS-Excel-based reports manually for management and other stakeholders.

Although the use of manual processes may not be consistent with ‘best practice’, the management and reporting systems that are in place ensure adherence to service targets and quality requirements.

The methodology applied by BT in relation to management information and reporting activities is unchanged from the previous year.

For an operation such as ECAS and from the information obtained during the site visits, it is the view of Analysys Mason that the approach taken by BT in relation to management information and reporting activities is still appropriate for this review period.

#### *Performance management (BT and specialist call centre company requirement)*

Performance management activities are supported by an established programme of quality reviews. Quality reviews for a selection of operator calls are conducted on a regular basis as indicated in Figure 4.6 below.

Figure 4.6: Operator call reviews [Source: BT, 2013]

Frequency	Reviewer	Reviewed
Monthly	Lead FLM	Five sample calls for each operator across all three sites
Weekly	Each FLM	Ten sample calls for each operator on the FLM's team
Weekly	External Reviewers	One sample call for each operator across all three sites

The reviews are completed using the ECAS RFT<sup>11</sup> Call Scoring Template Version 7 for guidance and marking. All reviewers use the same template and also meet once a month to discuss their observations and ensure that a consistent approach is taken for all reviews.

It is also understood that ECAS has recently linked the results of the review to operator bonus, meaning that the bonus payment will be affected if an operator is found to be underperforming.

The outputs/observations made during the review process are understood to be used for reporting requirements and performance enhancement, as detailed below:

- input to management reporting (BT) – observations and findings made by the external reviewers
- input to induction training (specialist call centre company) – observations and findings made by the external reviewers and the FLMs

<sup>11</sup> Right first time (RFT).

- Input to refresher training (BT) – observations and findings made by the external reviewers and the FLMs
- Input to on-the-job (one-to-one) training (BT) – observations and findings made by the external reviewers and the FLMs.

With the exception of linking the results of the quality reviews to the payment of operator bonus, the methodology applied by BT and the specialist call centre company in relation to performance management is mainly unchanged from the previous year.

For an operation such as ECAS and from the information obtained during the site visits, it is the view of Analysys Mason that the approach taken by BT and the specialist call centre company in relation to performance management is still appropriate for this review period.

#### 4.1.3 Costs of training: lead operators and others

In addition to the cost associated with the provision of operators, the specialist call centre company also charges BT for the following:

- the cost of training the operators
- the cost associated with the role of lead operator (supervision).

##### *Operator training*

Operator training is charged by the specialist call centre company based on the number of hours of training required multiplied by the hourly cost (i.e. the hourly cost of an operator).

##### *Lead operator*

A lead operator is entitled to a ~~3~~% mark-up on operator hourly pay in recognition of their additional responsibilities. The cost of supervision is therefore charged by the specialist call centre company as a ~~3~~% mark-up for lead operators.

The methodology applied by the specialist call centre company in relation to training costs is unchanged from the previous year.

For an operation such as ECAS and from the information obtained during the site visits, it is the view of Analysys Mason that the approach taken by the specialist call centre company in relation to training costs is still appropriate for this review period.

## 4.2 BT pay costs

BT’s own pay costs can be categorised broadly as follows:

- costs related to its staff – those 100% dedicated to ECAS, and those roles/functions providing a regular shared contribution to the ECAS operation (*labour – base costs*)
- additional engineering and technical support charged as required to ECAS (*labour – direct support costs*)
- other support services (*labour – other support functions*) charged as required to ECAS which includes legal, regulatory and finance.

A breakdown of the different categories of BT pay costs, for Q4 2012/13, is shown in Figure 4.7.

Figure 4.7: Breakdown of BT pay costs in Q4 2012/13 [Source: BT QMA, Q42012/13]



### 4.2.1 Costs related to dedicated and shared functions

The optimal levels are as set out in Figure 4.8.

Figure 4.8: BT staffing of ECAS operation [Source: BT, 2013]

Management team member	Quantity	Role/responsibilities
Head of Operations	1	The Head of Operations is ultimately responsible for the successful operation of ECAS. Other roles/responsibilities include liaison with internal and external stakeholders as well as suppliers.
FLMs	6	The FLM’s role within ECAS is to manage the day-to-day operational activities. Other roles/responsibilities include the following: <ul style="list-style-type: none"> <li>• monitoring call quality</li> <li>• on-the-job training</li> <li>• call handling, as required.</li> </ul>



Management team member	Quantity	Role/responsibilities
Service Manager	1	The Service Manager has overall responsibility for the technical support that is provided to ECAS.
Support Engineers	3	The role/responsibilities of the support engineers include the day-to-day maintenance of the ICT infrastructure across all three PSAPs and the two Equipment Centres. They operate a 24/7 shift rota to ensure that the service is supported at all times.
Support/Admin staff	2	Support/Admin staff are responsible for the preparation of reports and general administration for the ECAS operation. Other roles/responsibilities include the following: <ul style="list-style-type: none"> <li>• monitoring call quality across all three PSAPs on a weekly basis providing an additional layer of quality control</li> <li>• call handling, as required.</li> </ul>

Analysys Mason is of the view that the current organisational structure relating to the staff that are 100% dedicated to the ECAS operation is appropriate, and that the shared resources are all required to maintain the ECAS operation.

Relatively minor variations in the labour base costs were identified during this year's review. Upon further investigation the principal reasons for these changes were attributed to:

- the number of FLMs returning to the optimal level of six (a sixth FLM was not available for a period of time due to recruitment lead times)
- a shift allowance being applied to the basic salary of the FLMs, to make the terms and conditions of these employees consistent with other BT employees performing similar functions
- the number of 24/7 service engineers reducing from three to two due to recruitment lead times following the departure from BT of one of the engineers
- a slight reduction in the some of the shared IT/software functions.

Having reviewed the BT base costs for the reporting period, we consider these costs to be reasonable for inclusion in this CHF review.

#### 4.2.2 Additional engineering and technical support

Analysys Mason has observed that the level of additional engineering and technical support required has reduced over recent years – as the ECAS infrastructure has become more established, this is to be expected.

Having reviewed the level of engineering and technical support costs in recent years, ComReg has agreed with BT to calculate engineering and technical support costs using a cost driver of  $\times\%$  of base costs. In adopting this approach, ComReg is seeking to minimise minor fluctuations in the CHF caused by slight variations in these additional direct support costs.

Having reviewed direct support costs for the period January 2013 to August 2013, the cost driver of  $\times\%$  has increased to c.  $\times\%$ . Having discussed this increase with BT and ComReg, Analysys Mason considers an  $\times\%$  cost driver to be reasonable for this and future periods. However, we recommend that charges relating to engineering and technical support continue to be monitored and that the appropriate processes are maintained to record the time spent on required activities. At the same time, given the life-critical nature of the ECAS operation, we appreciate that engineering and technical support issues, routine or otherwise, need to be prioritised and direct support costs may vary accordingly in such instances.

#### 4.2.3 Other support services

BT also records the costs of support functions for which it does not have a dedicated team. The support service includes, but is not limited to:

- executive management (overall ownership of the ECAS operation drawing expertise from across the entire BT organisation)
- finance (preparation of quarterly and annual financial statements and supplying financial data and reports to ComReg)
- legal (reviewing contracts and correspondence)
- regulatory (liaising with ComReg and other stakeholders where necessary)
- procurement (maintenance of existing, and procurement of any new, third-party contracts).

Having reviewed the other support services' costs for the reporting period, we note some minor decreases in costs from the previous period, and consider these costs to be reasonable for inclusion in this CHF review.

#### 4.2.4 Annual wage inflation

For future forecasts of BT pay costs, an annual wage inflation of 1.9%<sup>12</sup> is used. This is an increase from last year's wage inflation which was set at 0.6%<sup>13</sup>.

### 4.3 BT non-pay costs

BT non-pay costs principally consist of the following elements:

- premises
- backhaul
- network maintenance
- other non-pay costs.

Figure 4.9 illustrates the breakdown of BT non-pay costs.

<sup>12</sup> <http://www.davy.ie/davy/genericPage.htm?page=macroforecasts>

<sup>13</sup> Davy Research, Macro Forecasts, updated July 13th 2012, Inflation wage of 2013F

Figure 4.9: Breakdown of BT non-pay costs in Q4 2012/13 [Source: BT QMA, Q4 2012/13]



### 4.3.1 Premises

Leased premises are used for two of the three PSAPs (Ballyshannon and Navan). For the third PSAP (EastPoint), BT utilises space within the premises of the third-party specialist call centre company.

#### *Ballyshannon and Navan*

In addition to the cost of leasing the premises at Ballyshannon and Navan, BT also pays local authority rates and costs for utility services at these locations. A facility management charge is also paid for these locations.

Navan also hosts one of the two Equipment Centres and, as a result, the utility cost for Navan is significantly higher than the cost for Ballyshannon.

#### *EastPoint*

The associated costs for the EastPoint PSAP are contained within the hourly rate that is paid by BT to the third party specialist call centre company.

Two visible changes were noted when comparing previous premises costs against the most recent reporting period.

- There has been a noticeable increase in energy costs. When consulted on this cost category, BT explained this is largely due to fluctuations in energy costs. While BT uses forward contracts to minimise the uncertainty in energy prices from its suppliers, some increases are inevitable given energy market price volatility.

- There has been a significant decrease in facilities management charges resulting from the benchmarking by BT Procurement, and a consequent reduction in allowable charges, outlined in last year's CHF review.<sup>14</sup>

Analysys Mason is of the view that all premises costs are reasonable and, as such, we have included them in determining the CHF for this period.

#### 4.3.2 Backhaul

Due to the need to adhere to the performance metrics set out in the CA, network backhaul is supplied by both BT and third-party suppliers (in order to maintain resilience).

BT also provides space for a second ECAS data centre in its main facility at CityWest.

The costs of backhaul and the data centre have been found to be reasonable when compared to prevailing market rates. Backhaul costs reduced slightly following renewal of one of the supplier contracts. We therefore consider these costs to be reasonable.

#### 4.3.3 Network maintenance

The ECAS provider has a number of support contracts in place, primarily of an IT/software nature.

The principal support contract is with the supplier of the infrastructure which provides the PSAP call distribution, management and recording platform, which underpins the ECAS operation.

The ECAS provider has further support contracts in place with additional IT and network equipment companies, which are necessary for the successful delivery of the ECAS operation.

Many of the support contracts put in place at the set-up stage were reviewed by ComReg in 2009–2010 and were found to be reasonable. No amendments have been made to these contracts in the intervening periods.

The following visible changes were noted when comparing previous costs against the most recent reporting period.

- There was an increase in the annual maintenance costs paid to the supplier of the infrastructure which provides the PSAP call distribution, management and recording platform – this increase arises from the additional support for the SMS functionality introduced previously.<sup>15</sup> A smaller additional related charge is also paid to a separate SMS management platform provider.

<sup>14</sup> *Recommendations for a Reasonable Call Handling Fee (CHF) associated with the Emergency Call Answering Services (ECAS), TERA Consultants, October 2012*

<sup>15</sup> This functionality was introduced to allow speech and hearing-impaired members of the public to make emergency calls to ECAS by sending SMS messages (texting) using their mobile phones; BT developed and implemented the SMS capability for ECAS during the year ending 31 March 2012.

- A correction in the annual charges associated with the supply of National Digital Radio Service (NDRS)<sup>16</sup> handsets to key ECAS personnel.

The above adjustments are considered to be acceptable and our overall view is that the network maintenance costs are reasonable.

#### 4.3.4 Other non-pay costs

Other non-pay costs include an allocation of accommodation, computing and telecoms costs for engineer support and other support costs associated with the ECAS operation. It also includes the cost of an annual audit of BT ECAS-related accounts.

These costs are allocated on the basis of cost drivers or are directly attributable.

Analysys Mason has reviewed the nature of these costs and considers them to be reasonable.

#### 4.3.5 Future costs

Where appropriate, an annual wage inflation of 1.9%<sup>17</sup> or an annual inflation of 2%<sup>18</sup> was applied for estimates of future costs.

### 4.4 Depreciation

Another significant cost is the annual depreciation and amortisation charge. The estimated annual cost of the depreciation and amortisation charge is EUR2.2 million. This is based on an initial investment of approximately EUR11 million, which is being written-off over the term of the CA (i.e. five years).

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 capital expenditure, 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.

<sup>16</sup> The NDRS is a purpose-built secure digital mobile radio network owned and managed by TETRA Ireland, and developed to meet the needs of Ireland's security, fire & safety, health, government and public-service agencies. The TETRA network allows emergency responders from different agencies to communicate as a combined group. Inter-agency collaboration in this manner means users can react more efficiently and in a fully informed manner when there is as a major accident or large rescue operation.

<sup>17</sup> <http://www.davy.ie/davy/genericPage.htm?page=macroforecasts>

<sup>18</sup> <http://www.cso.ie/indicators/Maintable.aspx>

#### 4.4.1 Fixed assets

A full review of fixed assets was completed in 2010.<sup>19</sup> As can be seen in Figure 4.10, the major costs incurred at the beginning of the ECAS operation were attributable to:

- the fit-out of Ballyshannon and Navan, the two buildings dedicated to ECAS provision which required most investment (this represents  $\times$ % of total fixed asset costs)
- the ECAS call handling platform, which represents  $\times$ % of total fixed asset costs.

Figure 4.10: Breakdown of fixed asset costs  
[Source: BT QMA, Q42012/13]



It is understood by Analysys Mason that, in accordance with Clause 15.1.3 of the CA, BT has sought and obtained approval from ComReg for capital expenditure on a number of additional items during the calendar year to 31 December 2013. The total cost of each of these is set out in Figure 4.11.

Figure 4.11: BT expenditure for delivery in 2013 [Source: BT, 2013]

Item	Description	Cost (in EUR)
SQL 2012	The ECAS management reporting system is currently based on the MS SQL 2005 service pack, which is understood to have reached end of life, and as such will have limited assisted service support from Microsoft.	$\times$
$\times$ storage	As a result of unforeseen growth in the amount of data generated by the ECAS operation, a requirement for additional data storage capacity at both Navan and CityWest Equipment Centres has been identified.	$\times$
$\times$	In the event of a server failure, BT has made provision for recovery using a spare server that can be configured to perform the role of any of the server components. BT estimates the time required for the current 'server recovery process' is likely to be in excess of six hours. The proposed $\times$ Backup and Recovery Advance Platform is expected to require less than two hours.	$\times$

<sup>19</sup> Horwarth Bastow Charleton (HBC) *Call Handling Fee Review for ComReg*, 17 December 2010.

Item	Description	Cost (in EUR)
Local call recording	<p>The current arrangement for the recording of emergency calls is based on a 'round-robin' algorithm that distributes and stores call recordings at two locations. As a result, every second call recording is written over a WAN link. A brief outage on the relevant WAN link could result in a failure to record a call.</p> <p>The proposed solution will result in the provision of a primary (local) and secondary (remote over WAN links) recording capability. All calls will be initially recorded on the primary and will only be recorded on the secondary in the event of scheduled maintenance or unscheduled outages.</p>	✂
SMS ID suppression	The ECAS SMS service is currently implemented on what can be described as the infrastructure/configuration that was deployed to support the pilot programme. As the ECAS SMS service is now a fully operational service, there is a requirement to enhance it to incorporate automatic undertaking identification for billing purposes. The proposed change will result in the addition of the 272xx suffix to the SMS number received for these purposes.	✂
SIP phone recording	ECAS uses SIP-based telephones to support general administrative requirements, as well as for routine/non-emergency communications with the emergency services and other stakeholders. As a result calls to/from SIP phones are not treated as emergency calls and are therefore not currently recorded. As there have been instances where the recording of these calls would have offered operational benefit, ComReg has agreed for the provision of a recording service for calls made/received on SIP phones.	✂
BT project management (for the above)		✂
<b>Total</b>		✂

Analysys Mason agrees with ComReg that the items described in Figure 4.11 are necessary to support ongoing ECAS operations. The depreciation of these additional assets over the remaining contract period is taken into account when calculating the CHF for this period.

#### 4.5 Set-up costs

A breakdown of set-up costs is shown in Figure 4.12.

Figure 4.12: Breakdown of set-up costs [Source: BT QMA, Q42012/13]



Having reviewed BT's management accounts for this period, Analysys Mason has identified no concerns with the deferred set-up cost analysis provided.



## 5 Finance costs

In addition to the in-life costs set out in Section 4, there are a number of finance costs taken into account when determining the CHF. These are:

- guaranteed rate of return
- cost of capital rebate
- the Sinking Fund
- prior period under-recovery.

### 5.1 Guaranteed rate of return

Under the CA, BT is allowed a guaranteed rate of return on its investment. This has been set at 6.63% on the gross book value of its investment (fixed assets and set-up costs) for the term of the CA. This return also covers any interest expense (cost of capital) that might be incurred on this investment through the use of some form of debt or equity finance.

As the guaranteed rate of return is part of the CA, the setting of the guaranteed rate of return is not within the scope of the review that ComReg must conduct under the Act of 2002, and hence is not considered further in this report.

Based on an initial investment of approximately EUR11 million the guaranteed rate of return is approximately EUR750,000 per annum to the end of the CA.

### 5.2 Cost of capital rebate

When BT won the tender to manage the ECAS operation, it had based its proposal on there being approximately 4.8 million emergency calls per annum. The maximum permitted CHF of EUR2.23 was set at the time by the Minister in order to allow the ECAS provider to recover the cost of operating the ECAS for this volume of calls.

However, there has been a significant fall in call volumes from the date the CA was signed and, as a result, BT under-recovered its costs during the initial period of the CA.

The cost of capital rebate is the estimated cost of the interest of this self-financing, i.e. the cost BT had to pay, or interest earnings foregone, as a result of this self-financing. This rebate is spread over the remaining period of the CA, and is presently set at ~~8~~%.

### 5.3 Sinking Fund

The Sinking Fund is for the sole purpose of accumulating, over the anticipated term of the CA, sufficient funds to cover any under-recovery by BT of either the reasonable costs, the guaranteed

return or the standby service fee during the final CHF period (except where the CA has been terminated for contractor default).

Under the CA, BT is required to transfer EUR250,000 per annum into an escrow account and this payment is included in the maximum permitted CHF. The escrow account is held and managed by the DCENR and is not under the control of ComReg or BT.

The administration, control and ultimate value of the Sinking Fund is under the direct control of the DCENR and not ComReg. ComReg cannot influence its use or its value further. ComReg must, however, include the prescribed value of the Sinking Fund in its calculation of the CHF each year for the duration of the CA.

#### **5.4 Prior period under-recovery**

As previously noted, BT developed and designed its ECAS operation to handle approximately 4.8 million calls per annum. As BT is entitled to recover the reasonable costs of running the ECAS, the CHF was set in order to allow this recovery. However, after the system went live, it became apparent that the number of calls being handled was significantly lower than that originally envisaged and that BT would not recover its costs. As a result, the ECAS provider did not recover all of its reasonable costs incurred in the initial period. Therefore, this under-recovery has to be recovered through the CHF over the remaining life of the CA, and the CHF is adjusted to reflect this.

In calculating the CHF, forecasts for reasonable costs and call volumes to the end of the CA have been used. Therefore, while there might be an under or over-recovery in any particular period the CHF has been calculated to remain as stable as possible over the term of the CA, rather than having significant fee increases and reductions annually.

## 6 Recommended CHF and sensitivity analysis

### 6.1 Calculation process

Following calculation of the in-life and finance costs and the ECAS revenues for each quarter, it is possible to calculate the loss or gain for each quarter. This then permits an assessment of whether BT has under-recovered or over-recovered its costs in past quarters.

The ECAS contract permits the recovery of reasonable costs incurred for the provision of ECAS over the contract period. In order to ensure that BT is exactly recovering its reasonable costs, the discounted sum of under and over-recoveries of each quarter must be equal to zero at the end of the contract period.

### 6.2 Recommended CHF

The CHF is therefore set using an iterative calculation, in such a way as to enable BT to recover its costs over the full contract period (including interests and past under-recoveries). Using this approach, Analysys Mason proposes a CHF of EUR3.08 per call to be applied from February 2014 until the end of the contract period.

Figure 6.1: Cumulated profit/loss (including cost of capital rebate) to Q1 2015/16 [Source: Analysys Mason, 2013]



Note: the profit/loss values include an allowance for the guaranteed rate of return.

It is important to note that the stability of our proposed CHF between February 2014 and the end of the contract period is dependent on actual volumes and costs matching those we have forecast. Each year, the CHF calculation will need to be revised to take into account costs actually incurred by BT in the preceding year as well as the actual volume of calls over the same period.

Analysys Mason has used conservative assumptions regarding the volume of calls, and hence call centre operator hours. Conservative assumptions have been considered in order to make sure that, if volumes of calls were to decrease significantly or reasonable costs were to increase in the future, no **significant** increase in the CHF should be necessary. Conversely, if volumes of calls were to increase or reasonable costs were to decrease, then the calculated CHF would need to decrease in the future years.

### 6.3 Reasons for adjustment

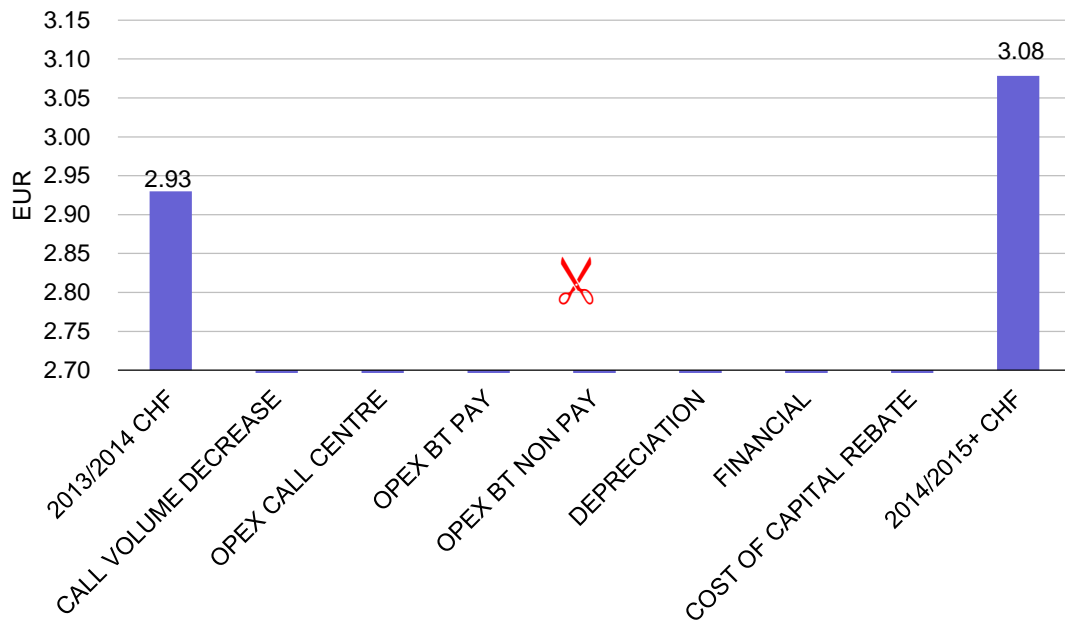
The main reason for the change in the CHF from the previous period is the fact that actual volumes observed over the last year were lower than expected, which resulted in BT recovering less from the CHF than was planned. Furthermore, the call volume decline over the remaining contract period is now anticipated to be greater than was previously forecast. It is therefore necessary to raise the CHF, both to compensate under-recovery in the previous period and to avoid continued under-recovery in the remaining contract period.

Counteracting the effect of the decrease in call volumes is a slight net reduction in in-life costs. Although some of the costs that BT is allowed to recover have increased (i.e. BT pay and depreciation charges), this is more than offset by reductions in other areas (i.e. call centre<sup>20</sup> and non-pay costs). Financial costs remain as forecast in the previous period. Finally, the cost of capital rebate due to BT is forecast to increase slightly, which means less revenue needs to be recovered through the CHF. An illustration of the incremental impact of each of these changes on the CHF is given in Figure 6.2.

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<sup>20</sup> Call centre operator hours reduce in line with forecast call volumes.

Figure 6.2: Overview of change from last year's review [Source: Analysys Mason, 2013]

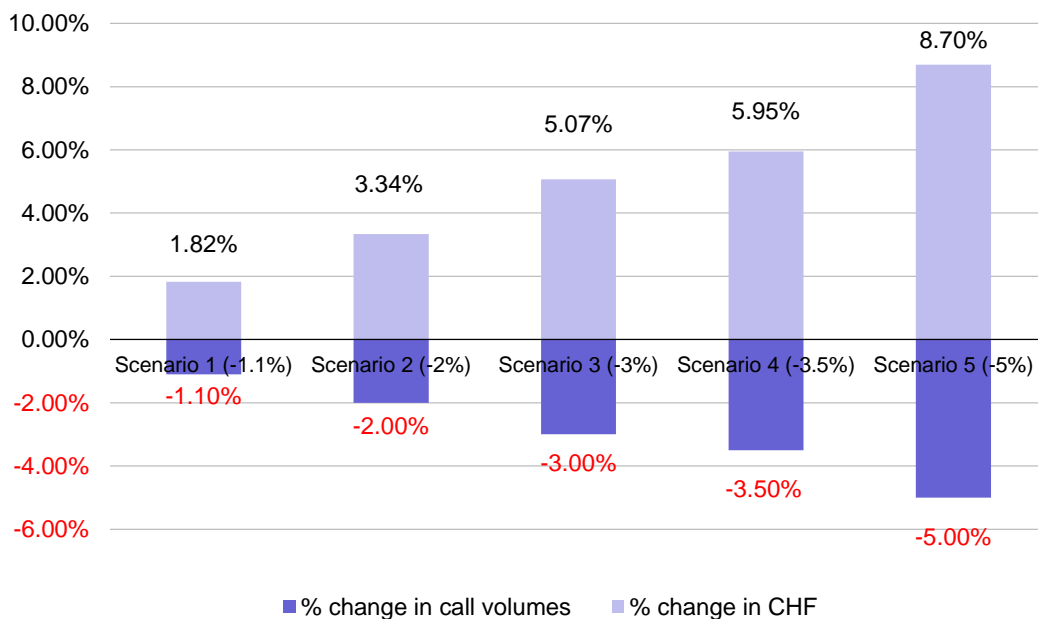


#### 6.4 Sensitivity analysis

Regarding the future call volume, five scenarios, as outlined in Section 3.3, were considered with the growth rate in volumes of calls set to 0%, -1.1%, -2.0%, -3.0%, -3.5% and -5.0%.

The impact of these changes in volume on the calculated CHF is shown in Figure 6.3.

Figure 6.3: Cost volume relationship [Source: Analysys Mason, 2013]



The actual growth rate in volumes of calls to ECAS in the most recent preceding 12 months was more negative than expected at  $-3.0\%$  (see Section 3). We therefore consider that the  $-3.0\%$  growth rate is an appropriate basis on which to calculate the proposed CHF.

## Annex A PSAP operational review and findings

We carried out an operational review of ECAS. As part of the review, we conducted information gathering and interviews with key stakeholders during the site visits; a list of site visits completed is provided in Figure A.1 below.

Figure A.1: Site visits completed [Source: Analysys Mason, 2013]

Site/location	Function/role	Date visited
NAVAN	PSAP and Equipment Centre	3 September 2013
Belfast	BT Managed Services Centre	5 September 2013
EastPoint	PSAP	16 September 2013

A site visit to the third PSAP location, Ballyshannon, was not considered necessary as its operational set-up is known to be equivalent to the operational set-up at EastPoint.

Similarly, a site visit to the second Equipment Centre location, CityWest, was not considered necessary as the equipment deployed at CityWest is known to be an exact replication of the equipment deployed at Navan.

### A.1 Methodology

The approach taken to complete this operational review was based on a number of site visits and consultations with key stakeholders within BT and the specialist call centre company. These are summarised in Figure A.2 below.

Figure A.2: Site visits and key stakeholders [Source: Analysys Mason, 2013]

Site/location	Function/role	Key stakeholder consultations	Date visited
Navan	PSAP and Equipment Centre	Head of Operations First Line Manager Lead First Line Manager Senior Service Engineer	3 September 2013
Belfast (NI)	BT Managed Services Centre	Senior Service Engineer Head of Operations BT Shared Services Centre resources	5 September 2013
EastPoint	PSAP	Head of Operations First Line Manager Lead First Line Manager Senior Service Manager Service Coordinator Resource Manager Lead Operator Operators	16 September 2013

In the remainder of this annex we summarise the results of the key stakeholder consultations conducted during the site visits completed as part of this review.

## A.2 Summary of site visits and understanding of ECAS

### A.2.1 Site visits programme

The site visits completed as part of this review included two of the three PSAPs, one of the two Equipment Centres and BT's Managed Services Centre, as described below.

#### *Navan (03 September 2013)*

At Navan, Analysys Mason and ComReg visited the PSAP and one of the two Equipment Centres. The review team was briefed by BT personnel in relation to the following elements of the overall ECAS operation:

- ECAS call volumes and forecasting
- ECAS platform overview.

The site visit concluded with a briefing/visit of the Equipment Centre in Navan.

#### *Belfast (5 September 2013)*

At Belfast, the Analysys Mason and ComReg teams visited BT's Managed Services Centre and were briefed by BT personnel on the role that the Managed Services Centre plays in relation to the ECAS operation. The briefing in Belfast consisted of the following:

- an overview of the Managed Services Centre and the role it plays in relation to ECAS
- a Managed Services Centre walkabout including the shared services desk and other locations/resources with a responsibility for dealing with incidents, changes and problems related to ECAS.

#### *EastPoint (16 September 2013)*

At EastPoint, Analysys Mason and ComReg visited the second of the three PSAPs. The review team was briefed by BT and the specialist call centre company personnel in relation to the following elements of the ECAS operation:

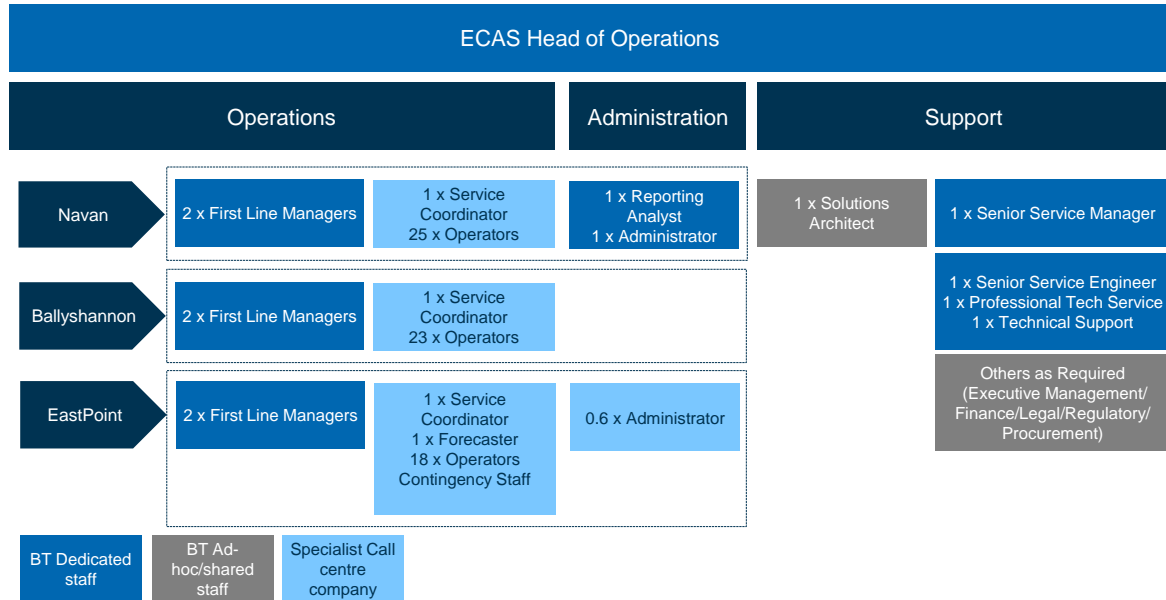
- operator resourcing (specialist call centre company)
- observation of an operator briefing (BT)
- review of training/refresher training (BT)
- review of right-first-time performance and quality-check template (BT)
- observation of live calls (specialist call centre operators/lead operator).



### A.2.2 ECAS organisational structure

Figure A.3 shows the overall organisational structure of ECAS.

Figure A.3: Illustration of ECAS organisational structure [Source: Analysys Mason and BT, 2013]



### A.2.3 Resourcing and team structures

Across all three locations there are approximately 84 dedicated resources utilised to provide the ECAS operation. Resources are either employees of BT or the specialist call centre company and are required to fulfil the following roles:

- BT is responsible for the overall service performance and provides a Head of Operations as well as two Front Line Managers (FLMs) for each location
- in addition, two dedicated administrators, both located in Navan, are also provided by BT
- BT also provides a Senior Service Manager and a Technical Support Team (3 × resources)
- the specialist call centre company is responsible for providing all operators and lead operators
- in addition to the operators, the specialist call centre company also provides a Service Coordinator at each PSAP location as well as a Resource Manager and an Administrator.

Figure A.4 summarises the resource levels by organisation.

Figure A.4: Breakdown of resources [Source: Analysys Mason, 2013]

Resource	Organisation	Quantity
Head of Operations	BT	1
FLMs	BT	6 (2 per location)
Administration	BT	2
Service Manager	BT	1
Technical Support Team	BT	3
Resources Manager	Specialist call centre	1
Service Coordinators	Specialist call centre	3 (1 per location)
Administration	Specialist call centre	0.6
Operators (Navan)	Specialist call centre	25
Operators (Ballyshannon)	Specialist call centre	23
Operators (EastPoint)	Specialist call centre	18
<b>TOTAL ALL STAFF</b>		<b>83.6</b>

## A.2.4 Locations

### *PSAPs*

Voice calls made using the 999/112 service (including calls from networks of other Authorised Undertakings) are currently forwarded by eircom to ECAS where they are answered in one of three contact centres (Navan, Ballyshannon or EastPoint).

### *Equipment Centres*

In addition to the PSAPs, two Equipment Centres are used to host the ICT infrastructure that is required to support the ECAS operation. The Equipment Centres, located in CityWest and Navan, are equipped and configured so as to allow for continuous operation of ECAS in the event of a single site failure. The Equipment Centre in Navan is co-located with the Navan PSAP.

### *Managed Services Centre*

BT's Managed Services Centre is located in Belfast and is the single point of contact for ECAS technical support. Operating on a 24 × 7 × 365 basis, all technical issues related to the ECAS, both re-active and pro-active, are logged, assigned a relevant priority (P1 to P5) and subsequently addressed via the Managed Services Centre.

#### ► *Managed Service Centre resources*

- 3 × dedicated ECAS Technical Services Group (TSG) engineers
- ECAS service desk team (on duty manager)
- shared services desk resource (for logging of calls)
- 1 × dedicated ECAS change analyst

- shared services TSG specialists (support for storage, networks, applications etc.)
- security manager
- shared problem manager
- shared incident manger
- shared change manger.

In addition to the resources listed above, there are also a number of internal and external third-party support teams that are utilised to support the operation of ECAS.

Internal third-party resources are employed by BT and provide the role as detailed in Figure A.5 below.

Figure A.5: Internal third-party support teams [Source: BT, 2013]

Support team	Support role
BT NOC (Dundrum)	Voice and data circuits and pro-active monitoring of UPS systems
BT VoIP (Core voice team)	BT and eircom voice interconnects
BT PS Application Management Team	SharePoint and SQL reporting
BT Security	Physical security, business continuity and ISO accreditations
BT Facilities	Power, generators and cabling

External third-party resources are other service providers/suppliers as detailed in Figure A.6 below.

Figure A.6: External third-party support teams [Source: BT, 2013]

Support team	Support role
✂	Second and third-line hardware and software support for the ✂ platform
✂	Second and third-line storage support and pro-active monitoring of storage components
✂	Servers, workstations and printers
✂	Routers, switches, adaptive security appliance (ASA) Firewalls and intrusion prevention system (IPS) appliances
✂	Operating systems, active directory and application support
✂	Anti-virus software support
✂	Back-up Exec software support
✂	Fixed-line and mobile operators
✂	Voice interconnects
✂	SMS platform

### A.2.5 Information management and reporting

BT uses the ✂ platform along with additional applications such as SQL server, MS SharePoint and MS Excel to support its management and reporting requirements.

The specialist call centre company utilises an industry standard resource scheduling package (eWFM) along with other applications such as MS Excel to support its management and reporting requirements.

### A.2.6 Call handling

The ECAS quality-of-service (QoS) parameter for average call handling time (the average length of time taken from when a call is answered by the operator until monitoring ceases) is 33 seconds<sup>21</sup> and is measured daily.

## A.3 Observations and findings

Details of the observations and findings as a result of the site visits and the review of information obtained from BT are provided in the following sub-sections.

### A.3.1 Locations

ECAS continues to be provided using three PSAPs supported by two Equipment Centres:

- The three PSAPs – located in Ballyshannon, EastPoint and Navan – have been in existence since the commencement of the ECAS operation in July 2010.
- The two Equipment Centres – located in Navan and CityWest – have also been in existence since the commencing of operations in 2010.
- The technology behind the ECAS operation is designed to provide an availability of 99.999%.
- During the period under review BT has commenced with some capital upgrade projects aimed at risk reduction and improvements associated with data storage, reporting, call recording, SMS billing and server recovery.

The capital upgrade projects are expected to reduce risk and make improvements associated with the elements of the ECAS system, as described above.

These changes/additions will be expected to support the capability to deliver an ECAS service that meets the required level of 99.999% availability.

In the event that both the Navan and CityWest Equipment Centres are unavailable, a fall-back contingency plan will result in emergency calls being directed to ☒.

Although the ECAS system has been designed to provide an availability of 99.999%, there is a slight chance that the entire system could fail. Should this occur, the ECAS operation reverts to the fall-back contingency plan as operated from ☒.

The availability of an additional fall-back solution that is independent of the equipment deployed to support the 99.999% availability requirement will allow for the continuous operation of the ECAS service even in the unlikely event of a catastrophic failure at both Equipment Centres.

<sup>21</sup> It was 36 seconds up until June 2012.

### A.3.2 Resourcing and team structures

The ECAS organisational structure represents best practice for such a critical requirement.

#### *Head of Operations*

The Head of Operations has overall responsibility for the successful operation of ECAS. Other roles and responsibilities include liaising with both internal and external stakeholders as well as providing strategic direction for the entire operation.

The role of the Head of Operations is of critical importance if ECAS is to operate successfully and meet its contractual requirements in relation to QoS parameters.

#### *FLMs*

The primary role of the FLMs is to manage the day-to-day operational activities of the operators. Carrying out this role includes monitoring call quality, training and call-taking duties during busy periods.

The ratio of FLMs (6) to operators (64) is currently 1:10.7; this represents a change in the ratio when compared to the previous reporting period (it was 1:12). Although the current ratio is appropriate for an operation such as ECAS, the number of FLMs required should be reviewed in the future if the volume of calls and subsequent operator numbers continue to decline.

On the assumption that future call volumes will continue to decline and will have an impact on the number of operators required, the future requirement for six FLMs will need to be reviewed on a regular basis.

#### *Technical Support Team*

The Technical Support Team provided by BT consists of one Senior Service Manager and three dedicated technical resources.

The three support engineers are responsible for the day-to-day maintenance of the ECAS ICT infrastructure. Additional support is provided on an as-needed-basis from the wider pool of BT technical resources.

The current provision of technical support is considered reasonable for an operation such as ECAS.

*Administration support*

BT provides two dedicated resources for reporting and general administration for the ECAS operation. The administration staff are also responsible for the completion of the external quality reviews used to determine the level of compliance in relation to call handling accuracy (one of the ECAS QoS parameters). In addition to all of the above, they are also trained to handle calls if there is a particular need to do so.

The current provision of administration support is considered reasonable for an operation such as ECAS.

*Resource manager*

The specialist call centre company's resource planner is responsible for ensuring that ECAS has suitable resources in relation to operators.

The current provision of one resource manager is considered reasonable for an operation such as ECAS.

*Service Co-ordinators*

The specialist call centre company's service co-ordinators are responsible for the day-to-day maintenance of rosters and human resource issues at each PSAP.

In addition to working closely with FLMs to maintain a high standard of operator performance, it is understood that service co-ordinators are required to manage core human resource aspects such as recruitment, training, absence, leave requests and shift issues.

The current provision of one service co-ordinator per PSAP (a ratio of approximately 1 service co-ordinator for every 20 resources) is considered reasonable for an operation such as ECAS.

**A.3.3 Information management and reporting**

Both BT and the specialist call centre company use industry standard applications to support their management and reporting requirements. However, some reporting and some management requirements are completed using manual data input and MS Excel work sheets.

Although such practices (manual data input) would not be considered best practice, adherence to service targets and quality requirements are being met.

It is assumed that additional costs would be required to totally automate the information management and reporting requirements for ECAS. However, considering the level of day-to-day operational management that is conducted, the degree of quality checks that are completed and the relatively low resource levels that are need to provide ECAS, it would appear as if the current practice is appropriate and no further expenditure is required.

### A.3.4 Call handling

#### *Call waiting alarm*

It was observed during the site visit to the Navan PSAP that during times when ECAS receives a large volume of calls, an audio tone/alarm will sound in the PSAP to indicate that there are calls waiting longer than 10 seconds to be answered. On hearing the alarm, appropriately trained resources located in the PSAP but not performing operator duties at the time can be utilised to clear any backlog of calls or further build-up of waiting calls.

The activation of this alarm was observed during the site visit to the Navan PSAP when a car travelling in the wrong direction on a motorway resulted in an unexpected surge in the volume of calls to the ECAS.

#### *Silent calls*

A significant number of calls received by ECAS (23.8% in July 2013) are classified as silent calls. It is understood from the time spent listening to live calls that operators are required to allow 30 seconds for dealing with silent calls.

Having to deal with silent calls is having a significant impact on the average call handling time for ECAS.

It is understood by Analysys Mason that UK PSAPs have an alternative approach to dealing with silent calls, in which the calls are forwarded to a police force interactive voice response (IVR) system for further monitoring.

Although it is not proposed that the changes to the procedure for monitoring silent calls be made in the short term, it should be considered for any future contract award in relation to the provision of ECAS.

#### *Filtering calls*

Filtering calls to determine which emergency service (ES) is required can add to the overall call handling time. It was observed from the site visits and interviews with key stakeholders that this has been the case for calls related to requests from the public for the ES for incidents related to water/drowning at sea, lakes, rivers, canals, etc.

At present, ECAS is required to filter calls and decide on which ES to direct the call.

It is understood by Analysys Mason that there is a proposal to forward all calls related to water/drowning incidents to the Coast Guard for further filtering.

In the event that calls related to water/drowning are further filtered by the Coast Guard, it is assumed that such an approach will have a positive impact (reduction) on ECAS call handling times. However, the number of calls involved is very low so the impact on ECAS will be minimal.

#### *ES call handling capacity*

It was observed during the site visits that the ECAS call handling times maybe impacted by the capacity of the ES to take calls from ECAS.

It is understood that the capacity of the ES to deal with calls from ECAS is outside ECAS/BT's control.

However, it is assumed that the ECAS provider is consulted in relation to any future plans by an ES to consolidate the number of call-taking locations or to introduce new technology to support the call-taking function.

#### *SMS text*

ECAS is already equipped to support emergency calls over SMS and has in the region of 12 000 registered users, of which only approximately 50% have provided supplementary additional information that can be used to expedite the call-handing process.

ECAS has pre-programmed messages and responses for use with SMS calls. ECAS has also recently noticed an increased use of SMS for the likes of mountain rescue where individuals are often operating in areas of poor mobile coverage but with sufficient coverage to support the sending and receiving of SMS.

### **A.3.5 Quality reviews of operator calls are linked to operator bonus**

Quality reviews of a selection of operator calls are conducted on a regular basis, as indicated in Figure A.7 below.

*Figure A.7: Operator call reviews [Source: BT, 2013]*

Frequency	Reviewer	Reviewed
Monthly	Lead FLM	Five sample calls for each operator across all three sites
Weekly	Each FLM	Ten sample calls for each operator on the FLM team
Weekly	External Reviewers	One sample call for each operator across all three sites



The reviews are completed using the ECAS RFT Call Scoring Template Version 7 for guidance and marking. All reviewers use the same template and also meet once a month to discuss their observations and ensure there is a consistent approach to all reviews.

The increased level of call quality reviews and the linking of the results of the review to operator bonus are understood to have had a positive impact (improvement) on the quality of ECAS call handling.

### *Monitoring calls*

Where specified in ECAS procedures, operators are required to monitor certain call types, as described below:

- Type A – where a call is routed to an ES and the operator is required to monitor the call for its entire duration.
- Type B – operator monitoring of Type B calls is terminated when the case location has been identified by the ES and acknowledged/confirmed by the caller.
- Type C – operator monitoring of Type C calls is terminated at the point of answer by the ES. Type C calls are supported by electronic transfer of case data between ECAS and the ES.

Monitoring of Type C calls does not currently take place as the electronic transfer of case data to the ES still needs to be implemented. However, in the event that electronic transfer of case data is implemented, this change will be expected to have a positive impact on ECAS call handling times as operators will be able to release calls once answered by the ES (unless the operator is time required to monitor the call).

### **A.3.6 Compliance with QoS requirements**

In accordance with the Concession Agreement (CA), the ECAS provider is required to provide the service to an agreed set of QoS parameters.

Details of the acceptable threshold value for each of the QoS parameters that the ECAS provider is required to achieve are provided in Annex C.

From the review of the Period Reports as supplied by BT for January 2012 to August 2013, it has been noted that with the exception of two minor non-compliances,<sup>22</sup> the ECAS provider is consistently exceeding the minimum acceptable threshold values for each of the QoS parameters as set out in the CA.

<sup>22</sup> Call handling accuracy of 98.4% (as opposed to a 99% requirement) in August 2012 and two complaints (as opposed to zero complaints) received in February 2013.

## Annex B Future challenges

Technological advances and growth in the use of mobile and IP (VoIP) based technology and devices are changing the way in which people communicate today. Support for such developments will need to be considered by those responsible for providing access to the emergency services if calls using these technologies are to be handled appropriately.

### B.1 Mobile technology and devices

Call details provided by BT indicate that, on average, 77% of the calls made to ECAS between August 2011 and July 2013 originated from a mobile phone network.

#### B.1.1 Improved accuracy in relation to calls originating on mobile networks

At present, when a call originating on one of the four mobile networks is received by ECAS, along with the caller's number, the operator is also presented with location details of the mobile cell in which the call originated.

##### **Improved accuracy in relation to calls originating on mobile networks**

The wide majority of Member States report Cell ID for mobile caller location. No Member State currently imposes stricter caller location criteria for mobile calls than Cell/Sector ID, although the technical solutions currently available allow for a much better accuracy.<sup>23</sup>

As the accuracy and reliability of caller location information improves and as Member States begin to impose stricter criteria, the ECAS PSAPs and operational practices will need to adapt.

#### B.1.2 The EC adopts proposals for the rollout of eCall in Europe

eCall is a European-wide initiative aiming to bring rapid assistance to motorists involved in a collision anywhere in the European Union. An eCall is activated automatically as soon as the in-vehicle sensors detect a serious crash. Once initiated, the eCall system dials the European emergency number 112 and establishes a telephone link to the appropriate PSAP. Details of the accident including the time it occurred, the accurate position of the crashed vehicle and the direction of travel (most important for accidents on motorways and in tunnels) is also forwarded automatically to the ES. An eCall can also be triggered manually by pushing a button in the car, which may be initiated by a witness to a serious accident.

<sup>23</sup> European Commission Communications Committee Working Document, COCOM 13-04 REV1, March 2013.

On 13 June 2013, a press release<sup>24</sup> issued by the EC referred to the adoption of two proposals to ensure that, by October 2015, cars will automatically call the ES in the event of a serious crash. The main points of the draft legislation are summarised below:

- from October 2015, all new models of passenger cars and light duty vehicles would be fitted with a 112 eCall capability
- by October 2015, the necessary infrastructure would be in place at the PSAP for the receipt and handling of eCalls.

Once the proposals as detailed within the press release have been approved by the European Council and Parliament, the EC's objective is to have eCall fully functional throughout the EU by October 2015.

#### *Bosch eCall*

In the meantime, a private eCall service is currently available and operational across 28 European countries. Provided by Bosch Communication Center – the Global BPO division of the Bosch Group, a monitoring centre in Frankfurt Germany receives the incident data and establishes a connection with the relevant ES.

#### *Ford SYNC*

Ford SYNC is another eCall system that is currently available on certain models of Ford cars. Unlike the Bosch solution described above, the Ford SYNC solution automatically calls 112, connects with the local PSAP and transfers data as well as establishing a voice connection directly without any interaction from an intermediary monitoring centre.

#### **PSAPs across the EU will need to be equipped to support eCall from October 2015**

In June 2013 it was reported that only 0.7% of vehicles in the EU<sup>25</sup> were equipped with a private eCall capability. However, from October 2015, the number of vehicles equipped with eCall will increase significantly. In addition, PSAPs across the EU will need to be equipped to be able to support calls and data transfer over the eCall system.

## **B.2 IP (VoIP)-based technology devices**

The difficulty associated with IP (VoIP) services is that location information that may be provided<sup>26</sup> may not reflect the caller's location. As a result, operators are required to obtain location details from the caller.

<sup>24</sup> See [http://europa.eu/rapid/press-release\\_IP-13-534\\_en.htm](http://europa.eu/rapid/press-release_IP-13-534_en.htm)

<sup>25</sup> See <http://www.eubusiness.com/topics/transport/e-call>

<sup>26</sup> Not all VoIP services provide location details

### **Improved accuracy in relation to VoIP emergency calls**

Call handling times could be improved and a faster response provided by the ES if more accurate location details are provided for VoIP calls.

Although it is understood that a solution being implemented by some VoIP operators is to tag each registered endpoint with a location, this is only applicable to fixed line-based VoIP services; VoIP services using smartphones, laptops and tablets will not always have the same endpoint (e.g. users of Skype and Viber).

Although this is an intermediate solution for improving the accuracy of location information for VoIP, PSAPs must become increasingly able to deal with the increasing use of VoIP and other multi-media forms of communication.

## Annex C ECAS quality of service parameters

The performance of the ECAS operation is monitored continuously by ComReg in accordance with a set of quantitative and qualitative performance metrics set out in the CA. These metrics are summarised in Figure C.1 below.

Figure C.1: Summary of ECAS QoS parameters [Source: ComReg, 2012]

Parameter	Definition	Threshold	Measurement frequency
ECAS availability	Availability = $U/(U+D)$ <ul style="list-style-type: none"> <li>U= Uptime, the total time when the ECAS service answers emergency calls presented to the ECAS switches and routes the call to the appropriate ES centre</li> <li>D= Downtime, which shall include loss of service for all reasons other than Force Majeure events</li> </ul>	99.999% on a 12-month rolling period	Monthly
Average speed of answer	The average time period between an emergency call being presented to the ECAS switch and the call being answered by an operator	1.3 seconds in one day	Hourly and daily
PAC 5	The percentage of calls answered within 5 seconds	97.5% in one day	Hourly and daily
Accessibility Index (Hit rate)	Percentage of quarter hours where 85% of calls are answered within 5 seconds. (Ignoring calls abandoned within 5 seconds.)	85% in one day	Quarter hours and daily
Customer or ES complaints	Customer or ES complaints for which ECAS is wholly or partially responsible	2 per month or 1 for every 200 000 calls	Monthly
Standards certification	<ul style="list-style-type: none"> <li>Information security management ISO 17799 and ISO 27001</li> <li>Business continuity BS 25999-1 and BS 25999-2 (when issued)</li> <li>Building standard</li> <li>ISO 9001:2000</li> </ul>	Annual certificate inspection	Annually
Average call handling time	The average length of time taken from when a call is answered by the operator until monitoring ceases	33 seconds in one day <sup>27</sup>	Hourly and daily
Average call routing time	The average length of time taken from when a call is answered by the operator until a call to the ES is initiated. Abandoned calls are omitted	Less than 15 seconds for 90% of routed calls in one day	Hourly and daily

<sup>27</sup> It was 36 seconds up until June 2012.

Parameter	Definition	Threshold	Measurement frequency
Average call abandon rate	The percentage of total calls presented to the ECAS switch that terminate prior to answer by the operator for whatever reason	<12% in one day	Hourly and daily
Call handling accuracy	Percentage of calls handled correctly according to the call handling process in five areas: <ul style="list-style-type: none"> <li>• call opening</li> <li>• process</li> <li>• call closure</li> <li>• call control behaviours</li> <li>• compliance</li> </ul>	99% monthly	Random sample of 50 calls per ECAS provider centre per month

