Telecommunications and the Falkland Islands: Policy Options

An independent study for the Falkland Islands Government

by

Dr. Chris Doyle
Senior Research Fellow

WARWICK
BUSINESS SCHOOL

THE UNIVERSITY OF
WARWICK

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This is the non-confidential version of my report. Confidential information and data have been redacted. Redactions are indicated by "(✂)"

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About the author

Dr. Chris Doyle is an academic economist and consultant specializing in competition and regulatory matters of relevance to the electronic communications sector.

Chris has provided extensive advice across the globe to: companies operating in both fixed and cellular markets; government agencies and courts.

He is currently an advisor to the Commission of Communications Regulation in Ireland and to the Independent Communications Authority of South Africa.

In the past he acted for the Government of Anguilla in negotiations with Cable & Wireless and has also provided advice to clients in many other countries including: Aruba, New Zealand, Nigeria, St. Lucia, United Kingdom and the United States.

Chris is a Senior Research Fellow in the Centre for Management under Regulation at Warwick Business School, University of Warwick. His written work has been published in many academic journals and he has presented seminars and lectures at universities in Australia, Europe, North America and New Zealand. He and his work have featured on television, radio and in newspapers worldwide.

He features in the 2004 "Trends in Telecommunication Reform" published by the ITU, and presented to the Global Symposium for Regulators on spectrum policy and market liberalization in Geneva in December 2004.

Chris has formerly held the positions Director of the Telecoms Team at London Economics; Vice President, Charles River Associates; Senior Research Fellow, London Business School, and Senior Research Associate at Cambridge University.

Contact: chris.doyle@cdoyle.com or chris.doyle@wbs.ac.uk

Preface

The Falkland Islands Government (FIG) commissioned this independent report on telecommunications. In June of this year the FIG engaged my services to provide independent advice regarding proposals the FIG received from Cable and Wireless (C&W) for the upgrade of the Camp Telecommunications network (commonly referred to as the "Camp system").

The scope of the assignment was outlined in a letter sent to me by FIG, dated 28 June, 2004:

Scope of assignment

a) An assessment to be made of the C&W proposals

b) A visit to the Islands to see things first hand and for discussions with key stakeholders (e.g. FIG, C&W, Councillors, Chamber of Commerce, Heads of Departments, people/businesses located in Camp)

c) Consideration of alternative solutions in view of any possible developments in telecommunications in the longer term (e.g. integration with Internet, increased satellite provision, mobile technology, etc.)

d) Evaluation of C&W cost estimates as presented in the C&W proposals

e) Financing options, e.g. cost sharing with C&W and the size of any FIG contribution negotiated against the renewal of C&W´s exclusive licence beyond 2010

f) Consider the benefits to the Islands of granting C&W a further exclusive licence, or, in the alternative, not granting an exclusive licence

g) Tariff modelling to ease the financing burden for FIG and C&W

In my report I cover all of the above and conclude by presenting a set of policy recommendations to be considered by the FIG.

Acknowledgements

My work on this assignment has benefited from extensive discussions with wide a range of interested parties. I am particularly grateful to all those who contributed during my visit to the Falkland Islands between 18 and 25 September, 2004. The itinerary and those who I met during my visit in September is reproduced in Annex A.

A special thank you is extended to all the residents of Hill Cove, Darwin, Goose Green, Fox Bay, and North Camp who attended open meetings to discuss telecommunications issues. I am also grateful to the residents of Stanley who showed a keen interest in the subject matter of this report.

I am also grateful to those involved in the private and public sectors on the islands, and would like to thank members of the Chamber of Commerce, and Tim Miller and Alison Ward, for organising a forum among business interests; and the General Manager of the FI Development Corporation, Julian Morris. I am also grateful to Camp Education Manager, Richard Fogerty, for providing insights on the use of communications technologies and distance learning in the Falklands.

Members of the Headquarters at British Forces, Mount Pleasant, have contributed to the report. I am grateful to Peter Taylor, Command Secretary, Wing Commander Chris Stace and Lt Cdr John Maskell-Bott. I am also grateful to Adrian Almond of the British Forces Broadcasting Service.

I am grateful to Cable & Wireless, who have cooperated throughout the production of this report. John Reynolds, Director of Operations, Middle East, Monaco and Islands; and Rick Hall, General Manager, Cable & Wireless Falkland Islands, have been very courteous and helpful. I am also grateful to Rick's team on the Islands who showed me around the Cable & Wireless facilities, both in Stanley and in Camp. I am also grateful to Kevin Cawood of VT Communications, who operate some of the communications facilities at Mount Pleasant, for a meeting in London in November.

I am grateful to councillors Roger Edwards, Ian Hansen, and Mike Summers. I would also like to thank Harriet Hall in her capacity as Acting Governor, and members of the Executive for their valuable time. In particular I would like to thank the Attorney General, David Lang, and the Financial Secretary, Derek Howatt, for their valuable time.

I am especially grateful to Pete King, Secretary FIG, who has been the principal coordinator behind this initiative and was a marvellous host during my time on the Islands.

The views expressed in this report represent those of the author and all errors are my sole responsibility.

The University of Warwick
January, 2005

Executive Summary

Telecommunications and the Falkland Islands: Policy Options

Dr Chris Doyle, Warwick Business School

Chapter 1 presents an Introduction to the Report with background discussion on government objectives and the economy of the Falkland Islands.

Chapter 2 looks at the telecommunications sector in the Falkland Islands and assesses developments that have occurred since 1988, the last year when major changes affected the sector. The chapter also examines the financial status of the Cable & Wireless business unit on the Islands, and [✂].

Chapter 3 examines the legislative and regulatory framework in place. Particular attention is paid to the licensing arrangements, which currently bestow exclusivity on C&W until at least the end of December 2010. The chapter also addresses prices and concludes that prices appear high in the Falklands for a range of services provided.

Chapter 4 focuses on the Camp and the provision of telephony services. The replacement of the current Camp radio system is discussed, where it is suggested this ought to occur soon and involve financial support from the FIG. Internet provision to Camp is also discussed.

Chapter 5 looks briefly at mobile cellular telephony services, currently unavailable on the Islands but under review by C&W.

Chapter 6 looks at broadband satellite services and considers the possibility of allowing large private users to self-supply service.

Chapter 7 concludes the report by presenting a framework for action in the form of policy recommendations and outlines a timetable for immediate policy action.

An annex provides the itinerary of my working visit held between 18 and 25 September, 2004.

Chapter 1 Introduction

This report is concerned with the telecommunications infrastructure, telecommunications users, and the implications for the Falkland Islands economy and society. The report focuses on possible paths for telecommunications on the Islands and assesses the likely impact over the next five to ten years.

The significance of telecommunications (or electronic communications) to the longer term economic development of the Falkland Islands is increasingly apparent. With this in mind, I have sought to address problems currently faced on the Islands and proposed policy actions that remedy these problems. I am also proposing in this report that a framework is put into place that leads to a more modern and suitable electronic communications infrastructure on the Islands.

Background[1]

The Falkland Islands are situated in the South Atlantic, some 400 miles (483 km) from the South American mainland and 850 miles (1,365 km) north of the Antarctic circle. They are located between Latitude 51º and 53ºS and Longitude 57º and 62ºW; approximately the same latitude south as London is north.

The archipelago consists of two main Islands (East and West Falkland) and 778 smaller islands, with a total land area of approximately 4,700 sq. m. (12,173 sq. km), nearly the size of Wales in the UK or Connecticut in the USA. The distance from Stanley, on the extreme east, to New Island, on the extreme west, is some 148 miles (238 km). Topographically the Islands are generally hilly, with the highest point at Mount Usborne, 2,312 ft (705 m.) on East Falkland and at Mount Adam, 2,297 ft (700 m.) on West Falkland.

The climate is characterised by a narrow temperature range, which varies from 24ºC (76ºF) in January to -5ºC (22ºF) in July, with a mean annual temperature of approximately 5.6ºC (42ºF). Temperatures can feel colder due to the wind. Rainfall is comparatively low and evenly distributed throughout

[1] This section has drawn extensively from "Falkland Islands…Sustaining a Secure Future", published by the FIG available at www.falklands.gov.fk.

the year, averaging 625 mm (24 ins) in Stanley. On average, the Islands enjoy more hours of sunshine than the south of England.

The 2001 Census records a resident population of 2,379 people. This figure excludes the 1,700-plus military and civilians based at Mount Pleasant Complex (MPC), and a further 112 residents temporarily absent on the night of the Census. The population is youthful, with 79% aged 55 years and under (1,892) and over 94% claims either British birth or descent. Many Islanders can trace their origins back over 150 years to the early days of settlement.

The capital, Stanley, has 1,989 residents, an increase of some 21.6% on the 1996 Census figures. The East Falkland population (excluding Stanley and MPC) stands at 208, West Falkland at 144, and the outlying islands at 38 people.

Government objectives

In 2001 the FIG published "The Islands Plan", which was aimed at achieving sustainable economic growth, whilst preserving the natural environment and unique culture of the Falkland Islands. The plan, which has since been updated, sought to diversify the economy away from a historical reliance on wool-income, to meat production for export and the construction of a deep-water port.

These measures have, to a large extent, been implemented and are helping to encourage the development of services onshore to support the fishing industry and related industries such as mussel farms and freezer plants. In addition, the policies are aimed at developing further cruise ship tourism. An important element of the FIG policies is the long-term viability of Camp.

In short, the economic plans of the FIG embrace policies consistent with the FIG's mission "to protect and to improve the quality of life of Falkland Islands people and community".

The Economy

The FIDC[2] describes the Falkland Islands economy as:

- a predominantly single source economy (fishing licence revenue) with agriculture and tourism substantially lesser contributory sectors; with a

[2] See www.falklandislands.com.

- limited working population; of
- limited technical and professional expertise; and that the economy is
- centrally controlled; and there is
- restricted private capital for investment; and
- limited internal and external transport facilities.

Despite these constraints, the income of the Falkland Islands has grown markedly since the mid-1980s, largely as a result of significant expansion in the fisheries sector.

In 2002/03 the GDP was estimated at around £70m, of which fisheries contributed 44%.[3] This amounts to an income per head of around £29,000 (excluding personnel attached to the MPC) or £17,000 per head (including personnel attached to the MPC).

In addition to the contributions made by fisheries and the military, the economy also receives around 35,000 tourists per year (largely disembarking off cruise ships).

There is no unemployment on the Islands, and around 15-20% of the workforce is from Chile and St. Helena.

The Islands Plan goal is the attainment of real economic growth of 3% per annum.[4]

Concluding remarks

The economy of the Falkland Islands is well developed and continues to evolve. However, as this report reveals, the Falkland Islands currently lack a modern telecommunications infrastructure that best meets the needs of business, residents and public sector agencies.

[3] Source "Falkland Islands – European Community: Single Programming Document and Indicative Programme for the period 2004-07" http://europa.eu.int/comm/development/body/csp_rsp/print/fi_spd_en.pdf.

[4] Further details about the economic development plans for the island are contained in "Falkland Islands – European Community: Single Programming Document and Indicative Programme for the period 2004-07" *op. cit.*

Chapter 2 Telecommunications in the Falkland Islands

Before 1988 the Islands telecommunications were provided by the FIG and Cable & Wireless (C&W). The FIG operated a number of internal (i.e. intra islands) communications systems and C&W operated the external (i.e. international) communications links.

The local loop

The telecommunications infrastructure in the Falkland Islands is no different to that found elsewhere in the world. However, the small size of the population means that the amount of physical infrastructure required to provide services is limited in scale. But despite the small amount of infrastructure required, the Falkland Islands is unable to benefit from economies of scale due to its small population.

The telecommunications infrastructure on the Islands largely falls into what is known as 'local loop network technologies'. There are two broad categories of local loop technologies:

- Wireline; and,
- Wireless.

Historically wireline and wireless local loop technologies have been used commercially by network operators to serve different markets, either geographically or in terms of service provision.

Wireline technologies have traditionally suited voice applications and their economics work best in more densely populated areas, such as Stanley.

Wireless technologies have typically been better at supporting high capacity data services, and are better suited for supplying telecommunications to remote regions, such as Camp.

Since the end of the 1980s the world of telecommunications has changed dramatically and this is having a profound effect on local loop technologies and market structures.

Of the many events that have occurred in the industry, four significant forces have played a prominent role since the early 1990s:

- Wireless cellular telephony has overtaken fixed line connections in terms of the provision of basic voice telephony;
- IP (Internet Protocol) packet switched technologies have emerged as the main driver for network topologies;
- Graphical user interfaces used on the Internet (more popularly known as the world wide web) have stimulated huge interest in access to the Internet; and
- Increased processor speeds and the declining costs of computers and related high technology goods have resulted in large increases in demand for home based PCs and laptops.

Post-1988 developments in the Falklands

In 1988 the FIG embarked on policy changes directed towards establishing a more modern and suitable internal telecommunications system. On 2 September 1988 an agreement was signed between C&W and the FIG which contained arrangements whereby:

- The cost of providing a new national telecommunications system would be shared between FIG and C&W;
- C&W would construct, install and commission the new national telecommunications system;
- That part of the new system within Stanley would be paid for and belong to C&W;
- That part of the system as falls within Camp was to be constructed by C&W but paid for by the FIG and belong to FIG and leased to C&W;
- An exclusive operating licence was granted to C&W which would expire on five years written notice given so as to expire not earlier than 31 December 2010;
- The FIG would introduce legislation conferring rights and obligations, and containing provisions related to the regulation of tariffs.

The new national system was based on the System X telephone switch, an automatic digital system developed in the UK by GPT.[5] In February 1996 the Very High Frequency (VHF) radio components within the Camp system were

[5] See http://web.ukonline.co.uk/freshwater/histatm.htm#chapter13.

replaced with a point to multi-point Integrated Radio Telecommunications system built by Lucent Technologies. C&W also operates an 8Mbps radio

Figure 2.1 The System X Exchange, Stanley, September 2004

point-to-point link between Stanley and Mount Pleasant, which carries all the MoD telecommunication services along with a number of payphone lines.

Table 2.1: C&W Falkland Islands, Number of Direct Exchange Lines (DELs) and dial-up Internet accounts

Line or Account Type	2002	2003	2004
Total DELs	2,418	2,600	2,605
Business DELs	547	560	552
Residential DELs	1,280	1,357	1,390
Active lines on Camp	333	335	357
MPA Camp lines	180	212	217
Dial-up Internet accounts	803	886	891

Source: Cable & Wireless Falklands, November 2004 Data for 2002 and 2003 refer to financial years, data for 2004 are for the calendar year up to October

The number of lines in the Falkland Islands, as shown in Table 2.1, indicates that every household that wants a telephone line probably has a telephone line. It is also interesting to note that the increase in active lines in Camp has occurred largely as a result of the increased use of telephony services (principally in the form of Internet access) by the military (MPC).

Financials

Cable & Wireless Falkland Islands is operated as a business unit within the Middle East, Monaco and Islands (MEMI) group in Cable & Wireless. Within this group, the Falkland Islands unit contributes around [✂] of revenues (consolidated turnover).

For the four financial years since 2001, the C&W Falkland Islands business unit has [✂] – as can be seen in Table 2.2.

Table 2.2: Financial Status of C&W Falkland Islands

Year ending 31 March	Total Revenue £ '000s	Revenue £ per DEL per month	Return on Capital Employed (ROCE = earnings before interest and taxation over net assets employed)[6]
2001	4,918	na	✂%
2002	6,043	208.26	✂%
2003	6,004	192.44	✂%
2004	5,923	189.48	✂%

Source: Cable & Wireless plc Falkland Islands Business Unit Management Accounts, author's own calculations

As can be seen above, the Falkland Islands business unit [✂] and revenue grew markedly between 2001 and 2002, the latter probably due to the establishment of a new tariff in January 2000 (discussed in chapter 3) and growth in Internet dial-up revenues. However, since 2002 the business has been static in terms of revenue, probably reflecting lower economic growth in the economy over this period. Furthermore, revenue per line has declined over the last three years by around £18, representing a 9% decline between 2002 and 2004. It is unclear what has precipitated the decline in revenue per line, as users appear to be making greater use of lines for Internet access and tariffs have broadly remained constant over this period.

One of the costs that the business unit must meet, if it is to be able to maintain itself on a sustainable basis, is the cost of the capital that is being used to finance the business and that will be needed to finance investment in the future. To assess these costs, it is necessary, first, to look at what the business is paying for the capital it is currently employing and, secondly, to assess its likely future investment and how that will affect its cost of capital.

In a fully competitive market, if a firm is efficient, it should be able to meet its cost of capital but, due to competitive pressure from other firms in the market, it ought over time to earn no more than the cost of capital. In competitive markets a firm can sometimes earn a return above its cost of capital, but this usually triggers firms to expand production and for other

[6] This is the nominal pre-tax ROCE derived using historical accounting data. An alternative approach would look at real returns using current cost accounts.

firms to enter the market, the effects of which lead to lower prices and consequently a reduction in the return on capital employed. The converse also applies.

In a monopoly market, as in the Falkland Islands, competitive forces are unable to rein back returns on capital employed when they exceed the cost of capital. Ideally government ought to intervene in a regulatory capacity to allow the C&W business unit on the Falkland Islands to earn a ROCE that covers its *cost of capital*, but no more so. This raises the question: What is the cost of capital? This is difficult to answer, both in theory and in practice. [7]

In order to determine the acceptable rate of return on capital employed, it is necessary to examine the cost of funding the C&W Falkland Islands business; that is, its cost of capital. The capital employed by a firm comprises debt and equity (shares), and an acceptable ROCE would allow the business unit to cover its cost of capital. However, the C&W Falkland Islands business unit is part of the larger C&W plc, a publicly quoted company. C&W's cost of debt and cost of equity will be dependent on a number of factors, including the mix of debt and equity held by the company.

In general debt can be a cheaper source of funding, but can be more risky since interest must be paid on it each year, and equity can be a more expensive source of funding but may carry less risk because the dividend on shares can be waived, if circumstances demand it, without the future of the business necessarily being put at risk.

In general a business seeks to choose a mix of debt and equity that minimises its weighted cost of capital; that is, the sum of the cost of debt and cost of equity weighted by the proportion of debt and equity in total capital employed. The weighted average cost of capital (WACC) usually follows a 'U' shape, such that a firm with a low proportion of debt faces a high cost of equity capital and a firm with a low proportion of equity faces a high cost of debt funding. Higher levels of debt tend to be seen as increasing the level of risk, in which case equity investors will look for a higher rate of return, so increasing the cost of capital. Lower levels of debt will mean that the advantages of this cheaper form of funding have not been maximised.

The cost of equity is the more difficult component to estimate of the WACC, as it depends on how the stock market views the prospects of the firm. A widely used method to assess the cost of equity is the Capital Asset Pricing Model (CAPM). This is based on assessment of how the market responds to the volatility of the share price over a period. Generally, in a stable economy,

[7] See the Joint Regulators Study on Cost of Capital "A Study into certain aspects of the cost of capital for regulated utilities in the UK" by Stephen Wright, Robin Mason and David Miles, February 2003. Available at: http://www.ofcom.org.uk/static/archive/oftel/publications/pricing/2003/capt0203.pdf.

the market will look for a return substantially above the "risk free rate", the theoretical interest rate at which an investment may earn interest without incurring any risk. The return in excess of the risk free rate is known as the "market risk premium" or "equity risk premium".

The Office of Utility Regulation for the States of Guernsey has recently encountered the issue of assessing the cost of capital for the Cable & Wireless operating business unit based on the island.[8] Guernsey has a larger population than the Falklands[9], its telecommunications sector is liberalised and network competition has occurred since 2003, and the incumbent C&W business unit provides both fixed and mobile telephony services. Nevertheless, there are many characteristics that are similar to those in the Falkland Islands (such as similar income levels) and it is very interesting to note that C&W Guernsey believes that its pre-tax nominal cost of capital is around 12.6%. [10]

If we assume a similar weighted average cost of capital for the Falkland Islands as in Guernsey, this suggests that the business unit in the Falkland Islands has [✂].

Concluding remarks

The telecommunications infrastructure on the Falkland Islands provides a universal service, though I have not been able to assess the quality of service

[8] See "Price Control for Telecommunications Services in Guernsey: Calculating Allowed Revenue and Cost of Capital", Consultation Document OUR 04/11, June 2004, available at http://www.regutil.gg/docs/our0411.pdf .

[9] Guernsey's population was estimated to be 59,807 at the last census in April 2001, see "2004: Facts and Figures" available at http://www.gov.gg/esu/2004_F&F_frame.htm.

[10] The estimated cost of capital is based on the corporate rate of tax in Guernsey of 20%. In the Falkland Islands the rate of corporation tax from 1 January 2004 is 20% on profits up to £1 million and for profits thereafter the marginal tax rate is 25%. See http://www.falklandislands.com/government/currency_tax.asp?print.

provided. My meetings with residents suggested that quality of service was reasonable for voice telephony but poor for dial-up Internet access.

The financial status of the C&W business unit on the Falkland Islands appears [✂].

In the next chapter, where I review the tariff for some of the services provided to residents and businesses on the Islands, it would appear that prices are high. [✂]

Chapter 3 Legislation and Regulatory Framework

The Telecommunications Ordinance 1988 (No. 24 of 1988) (the "Ordinance") is the law governing telecommunications in the Falkland Islands. The Ordinance sets out, *inter alia*, the licensing framework, and the powers vested in the state with regard to rights and obligations within licences.

Licensing

The Ordinance, section 3(4) essentially provides a *de jure* monopoly for C&W in the Falkland Islands for the provision of public telecommunications services:

> "If a licence granted under this section [3] licences the provision of all public telecommunications services, both internal and external, for the Falkland Islands, the licence may be expressed to be an exclusive licence, in which case no further licence shall be granted under subsection (2) which takes effect before the expiry or sooner determination of that licence".[11]

Section 8(1) of the Ordinance does, however, permit the establishment and operation of private telecommunications systems without licence (i.e. licence exempt) by a person if the private system is operated "only within a single area of that person's property" and "is independent of any telecommunications system operated by any other person".

The licensing framework established in 1988 was designed primarily to ensure that the investment required for a more modern and suitable internal telecommunications system was afforded protection. It was also designed in recognition of the special circumstances prevailing in the Falkland Islands that inevitably led to the conclusion that the market was best served by a monopoly provider.[12]

[11] Section 4(3) of The Telecommunications Ordinance 1988.

[12] In the parlance of economics, the least cost way to provide telephony services to consumers in the Falkland Islands is through one firm (a *natural monopoly*). Because of the need for substantial capital investment requiring large up-front costs and large fixed costs, one network is likely to be able to provide services at a lower average cost than several networks combined who would inevitably duplicate some of the infrastructure.

Regulation

The Ordinance also outlines the regulatory framework. Section 10(2) defines a price ceiling for services specified in a Schedule attached to the Ordinance. The services included in the 1988 Schedule were:

- Rental of lines
- Telephone call charges (domestic and international)
- Other calls
- Telex calls
- Facsimile calls
- Installation fees

Maximum prices for key services in the Schedule are presented in Table 3.1, along with revisions, permitted under section 45(2) of the Ordinance (see below), which came into force in December 1999. Table 3.1 also makes a number of comparisons with C&W business units in Guernsey and St. Helena.

It can be seen in Table 3.1 that the business unit in the Falkland Islands is currently setting prices at the highest level permitted for services subject to price control. The prices shown are, for the most part, higher than those for the comparable products available in the States of Guernsey or St. Helena.[13]

For services not listed in the Schedule to the Ordinance or in the Revised Telecommunications Tariff Regulations 2000 (the "2000 Regulations"), Falkland Islands C&W is allowed, under section 10(3) of the Ordinance, to "recover such charge as may have been agreed".

The 2000 Regulations introduced dial-up Internet charges into the Schedule. Table 3.2 shows the retail charges for dial-up Internet use in the Falkland Islands, and compares these with rates in Ascension, Guernsey and St. Helena. It can be seen that for

[13] It should be emphasised that the prices shown in Table 3.1 are for a small sample of services and products available in the countries. However, the portfolio of products and services appears to be larger in both Guernsey and St. Helena.

Table 3.1: Maximum permitted prices of key services provided by C&W Falkland Islands and comparisons with standard retail prices offered by C&W Guernsey and C&W St. Helena

Service	Permitted under 1988 Schedule	Revised under subsidiary legislation January 2000	C&W Falkland Islands retail tariff	C&W Guernsey retail price for comparable product	C&W St. Helena retail price for comparable product
Residential rental	£4.00 per month	£8.00 per month	£8.00 per month	£5.43 per month	£4.00 per month
Business rental	£8.00 per month	£20 per month	£20 per month	£5.43 per month	£15 per month
Installation in Stanley	£15 per line	£60 per line	£60 per line	£101.30 per line	£30 per line
Installation in Camp	£100 per line	£175 per line	£175 per line	£101.30 per line	Individually assessed
Domestic calls	5ppm	6ppm	6ppm	1.7ppm	n/a
Calls to UK	£1.50pm	£0.99pm*	£0.99pm*	3.7ppm	£0.95ppm
Calls to ROW	£1.80pm	£1.10pm*	£1.10pm*	Various+	£1.00ppm to FI

ROW=Rest of World. * Standard peak rates. + Many different rates offered, e.g. Australia is £0.049ppm and the Falkland Islands £0.49ppm. n/a means not available on website. The revised subsidiary legislation in the Falkland Islands is "Telecommunications: Revised Telecommunications Tariff Regulations 2000", S.R. & O. No. 1 of 2000, made 6 January 2000, published 16 February 2000 and coming into force 1 December 1999.. Prices For Guernsey as at May 2004, see http://www.cw.com/guernsey/docs/price_lists/exchange_lines_price_list.pdf and http://www.cw.com/guernsey/docs/price_lists/S0850_Call_Charges_04_2004.pdf and for St. Helena as from September 2003 and applicable, November 2004, see http://www.cw.com/sthelena/products_services/rates/sthel_03_03_02.html.

Table 3.2: Internet Charges for C&W business units in the Falkland Islands, Ascension, Guernsey and St. Helena

Service	Falkland Islands	Ascension	Guernsey	St. Helena
Monthly fixed fee	£10.00	£10.00	Free	£5.00
Internet calls:				
Standard rate	10ppm	8ppm	2ppm	n/a
Off-peak	8ppm	6ppm	1ppm	n/a
Weekend	6ppm	3ppm	1ppm	n/a

Source: Cable & Wireless website www.cw.com November, 2004. Call charges not shown on website for St. Helena.

the rates shown, those set in the Falkland Islands are higher than those in the other countries.[14]

Section 11 of the Ordinance permits the FIG to submit written requests to the Falkland Islands C&W business unit in regard of traffic passing over the system. The Ordinance also contains a universal service provision, as section 26(3) requires a telecommunications utility not to refuse unreasonably to provide a telephone service.

The main powers available with regard to price control are provided in section 45, which enables the Governor to amend, add or otherwise vary the Schedule. This provision also enables a telecommunications utility to request price changes to services in the Schedule.

Where there is disagreement over proposed price changes, section 46 outlines a procedure for arbitration. A key part of section 46(3) states:

> "it is declared that the tariff shall be fixed and from time to time reviewed in such manner as to enable the telecommunications utility to operate and maintain national and international telecommunications systems and services in the Falkland Islands on an economic basis with a reasonable return on its investment after allowing for all costs (including the payment of amounts equal to 5% of net revenue within the islands to the head office of the telecommunications utility…)".

[14] Comparisons across the countries have not taken account of charges made for email accounts, DNS registration, web space and other services.

Concluding remarks

The regulatory framework governing telecommunications in the Falkland Islands was designed at a time when it was expected that only one operator could provide services on a commercial basis. The Ordinance therefore provides C&W Falkland Islands with an exclusive licence. As such competition is not able to rein back any excessive prices and the company is not under the normal commercial pressures to minimise costs and improve or maintain quality of service.

The financial performance of C&W Falkland Islands appears healthy at present, though the figures presented above are based on historical accounting data. Nevertheless, the prices for some services in the Falkland Islands appear relatively high when compared against comparable products offered by other C&W business units.

Ideally competition would be the best way to bring about lower prices and improvements in quality of service. However, it is doubtful whether competition in the telecommunications sector could be sustained on the Falkland Islands, given the small population size. Some niches within the market may benefit from some liberalisation, possibly in areas related to services provided to business users and the Internet. However, caution needs to be exercised regarding liberalisation, as universal service may be jeopardised if competition were to 'cream-skim'.

But perhaps the biggest gain in improvement over the next few years would derive from closer scrutiny by the FIG of C&W Falkland Islands. At present it appears that the FIG routinely receives the annual management accounts presented by C&W Falkland Islands, with little attention paid to quality of service performance and profitability.

In the policy recommendations outlined below, I advocate a more hands-on approach to ensure that consumers on the Islands get a fair deal, and that C&W Falkland Islands receive a reasonable return on the assets employed.

Chapter 4 Camp and Telephony Services

An important policy objective for the FIG is the long term viability of Camp. In the sphere of telecommunications, Camp residents have benefited from a policy that resulted in the costs of providing the Camp telecommunications infrastructure put in place in 1988 being borne by government, and the upgrade costs in 1996 being shared between C&W Falkland Islands and government.

The dispersed population in Camp inevitably means that the cost of service provision per pop is higher than that in Stanley. As in most countries in the world, serving remote communities with telecommunications services usually requires an element of cross-subsidy and subsidy.

Cross-subsidy tends to come in the form of prices for some services being set at rates so as to generate profits that can be used to offset losses incurred when providing services to certain users. Subsidy usually takes the form of direct government support, as has occurred in the Falkland Islands.

Both subsidy and cross-subsidy are widespread in the telecommunications sector around the world, and in this regard the Falkland Islands is no different.

Camp Radio System

The current Camp Radio System (CRS) is a point to multi-point system[15] provided by Lucent Technologies. The system is acknowledged by Cable & Wireless to be near the end of its working life, and as the manufacturer no longer provides spare parts it is only a matter of time before the system becomes fully obsolescent. There is therefore a need to replace the system as soon as possible.

In October 2003 Cable & Wireless presented FIG with a document that discussed a range of options with regard to the replacement of the CRS.[16] This document was a helpful first move in a process that should see the CRS replaced with a contemporary technology that ought to be *future proof*.

[15] Signals can be sent from a point in the system to several points (multi-point).

[16] "An overview of available technologies for the replacement of the Camp telephone system" Cable & Wireless, Falkland Islands, David J. Lewis, October 2003.

Figure 4.1 The author with Rick Hall, General Manager C&W Falkland Islands, reviewing a re-broadcasting station belonging to the Camp system on the Malo Hills, September 2004

The financial scenarios considered in the Cable & Wireless document presented a range of indicative figures with initial costs ranging from £2.13m to £6.87m, or between £5,966 and £19,244 per active DEL in Camp. However, these estimates are dated and probably overstate the current cost of providing a future proof Camp communications system. Innovations continue to occur in the area of radio communications and new systems are evolving (e.g. Mesh networks) that enable substantially lower costs of provision.

In discussions held with Cable & Wireless, as part of this review, it appears that the financial modelling previously undertaken is being reviewed by the company. This is welcome, as some of the scenarios in the original document

appear to have costs which are relatively high, and the replacements discussed were not exhaustive.

It is not possible in this review to undertake the kind of detailed cost modelling required for a replacement CRS, as this requires in-depth knowledge about the way in which the new system would work with the other parts of the C&W infrastructure on the Islands. Furthermore, C&W has indicated during the course of this review that the System X exchange currently in service will likely be replaced in the near future. This makes the task of assessing the cost implications of a Camp replacement system much more difficult.

However, it is worth repeating that the C&W business unit on the Falkland Islands is profitable, and the business includes the loss-making Camp radio telephone system.

Internet use

My meetings with Camp residents revealed extensive interest and use of dial-up Internet services. This service appears to form an increasingly important part of the social and economic fabric of Camp life. However, the service provided at present is woefully inadequate to meet the needs of Camp residents, and is unable to support more advanced educational and health services.

The cost of dial-up (as shown in the previous chapter) was regarded as excessive, and the quality of service was generally viewed as poor. However, I have not been able to examine any data to assess quality of service.

It was also remarked that the current time for reduced dial-up charges (10pm) was too late to be of any material benefit for most Camp residents. The working lives of Camp residents is such that early awakening hours mean that late nights are an exception. C&W could explore the possibility of offering Camp residents a discounted dial-up charge occurring before 10pm, say 8pm.

Next steps

There is likely to be a need for the FIG to contribute towards the replacement of the CRS. To what extent the FIG should contribute depends in part on the loss that C&W would otherwise incur if it were to provide the service without subsidy.

The loss that a new Camp system would make (assuming it does) also depends critically on the specification for the new system. At a minimum, a replacement system should be broadband enabled (be capable of offering

DSL levels of speed) and future proof. The specification of the new system would be determined through negotiation between the FIG and C&W. Having presented a minimum requirement to C&W, the company should present FIG with revised costs for replacing the CRS.

But the FIG should note that the C&W business unit on the Falkland Islands is earning a [✂]. If C&W is seeking financial assistance for the Camp replacement system, this suggests that the returns it enjoys on the non-Camp system are even higher than the figure calculated for the business as a whole shown in Table 2.2 above. The extent the FIG should contribute towards a new Camp system should take account of the returns C&W enjoys from operating under the current exclusive licensing arrangement.

Chapter 5 Mobile Telephony Cellular Services

At the present time the population on the Falkland Islands is not served with a cellular service. During the course of this review Cable & Wireless has indicated that it is reviewing whether a limited cellular service on the Islands would be commercially viable. Limited here refers to geographic coverage, as the cellular service would only be expected to cover Stanley, Mount Pleasant (MPC) and most of the corridor between MPC and Stanley.

Although limited in geographic coverage, a cellular service, of the kind under review, would likely be used by most residents on the Islands and would cover over 80% of the population.[17] It is likely that most residents in Camp would not be covered by a cellular system. It is worth noting, however, that Camp residents would benefit from a cellular system as they would be able to make use of the system when in a coverage area, and Camp residents in a coverage area (e.g. when visiting Stanley) would be in contact with residents in Camp and elsewhere.

To a large extent a cellular service would complement the existing fixed line telephony services, and as experience in many parts of the world reveals revenue generated from telephony services would increase.

Cellular on the Falkland Islands

C&W Falklands should provide the FIG with its review of the commercial viability of a cellular service on the Islands. If C&W conclude that it is not commercially viable, the FIG could explore whether it is in the wider interest of residents to make a contribution towards the provision of a service.

More generally, FIG should assess whether a cellular service should be provided by C&W, the incumbent operator. During this review I have held a meeting with VT Communications (who operate at the MPC) who indicated an interest in providing public telephony radio based communications on the Islands.

[17] A cellular population coverage in excess of 80% is high by international standards.

With an appropriate licence fee in place, and with a revision to the statutes, it would be possible to accommodate another provider of services. However, as mentioned earlier in this report, it is doubtful whether the population size of the Falkland Islands could accommodate multi-operator competition.

Chapter 6 Broadband Satellite Systems

Given the location of the Falkland Islands, international telephony services and broadband services necessitate satellite access. The role of satellites has increased markedly in recent years, and their use by businesses in particular has expanded enormously. Satellites are also used extensively in broadcasting and many households on the Falkland Islands receive television signals via satellite.

The earth ground station in Stanley, shown below in Figure 6.1, is a crucial gateway for external communications.

Figure 6.1: Satellite dish at the earth station, C&W Stanley, September 2004

Background

Satellites were originally used to provide high capacity, inter-continental transmission links between dedicated ground stations that linked into the PSTN (Public Switched Telephony Networks). Over the last 10-20 years this

role has been displaced by the availability of very high capacity undersea cable systems – though satellite connectivity is still used to provide back-up and alternative routing. At the same time, satellite technology made significant advances leading to the development of higher capacity satellite platforms and smaller, lower cost terminal equipment.

This encouraged the use of satellites by private organisations as a means of providing competitive communications links. VSAT (Very Small Aperture satellite Terminals) in particular has made satellite communications competitive with wired solutions, even in areas with a well developed telecommunications infrastructure. Satellite based mobile and rural telephony services have been developed together with a range of different terminals to suit the needs of fixed and mobile users. More recently increasing demand for Internet access, and email and multi-media services has encouraged the development of broadband satellite systems.

Traditional satellite and VSAT

The traditional telecommunications satellite system is based on geo-stationary earth orbit (GEO) satellites, placed in orbit 35,786 kilometres above the earth's surface. At this height the orbital speed of a satellite matches the rotation of the earth so that the satellite maintains a fixed position relative to the earth's surface; they are geosynchronous. GEO satellites are widely used for video distribution. However, use for voice communications has been limited by the unacceptable delay in propagating the radio signal to the satellite. [18]

Global satellite operators, such as Inmarsat, Intelsat and PanAmsat, maintain constellations of satellites, and a corresponding network of ground stations. They are able to offer service in almost any part of the world, including the Falkland Islands.

VSAT service providers are also offering access services in direct competition with wired operators, particularly in North America and Europe. The majority of customers are larger organisations requiring higher bandwidth connections but service providers are now developing offerings suitable for smaller businesses and residential users.

[18] However GEO satellites can provide backup voice service capability in the event of a cable system failure.

VSATs and the Falkland Islands

At the present time the Ordinance prohibits the use by any person or corporate entity public telecommunications systems that are dependent on systems operated by other persons. This means that a number of businesses on the Islands are denied an opportunity to avail of services using VSAT facilities, as I understand these are currently not provided by C&W in the Falklands at present. This is particularly the case for businesses operating in the vitally important fisheries sector, and also in the emerging tourist sector. Consequently many business users, denied choice, are paying prices that are too high for services that are arguably sub-standard or fail to meet their needs.

The FIG should impress upon C&W that investment in faster Internet access products, such as those enabled by VSAT technologies, would benefit businesses on the Islands.

It is unlikely that allowing some liberalisation in this area would be wise, as permitting large business users to bypass the C&W network would financially challenge C&W and undermine its ability to provide a universal service.

Chapter 7 Policy Recommendations

In this review I have assessed the status of telecommunications on the Falkland Islands. While today the provision of basic service is universal, prices are high and quality of services seem inadequate. Furthermore, the Falkland Islands lack a modern telecommunications infrastructure to meet the needs of businesses, residents and public sector agencies over the next 5-10 years.

My main observations are:

- Prices – too high
- Quality of services – too low and inconsistent
- Profitability of C&W business unit – [✂]
- Broadband – DSL service unavailable
- Mobile cellular – service unavailable
- Advanced business internet services – inadequate

To address many of the problems identified in my report and allow the Falkland Islands to benefit from the kinds of telecommunications services now taken for granted in similarly rich countries, the FIG needs to make greater efforts in policy in the area of telecommunications.

The following identifies three key areas for policy action to be considered by the FIG over the next few months.

Market Structure

- Competition – while desirable is unlikely to be sustainable in the Falkland Islands due to the small absolute size of the market and the relatively high costs of provision. However, FIG should impress upon C&W that services provided to users, and business users in particular, should, where possible, be equivalent to those that are offered in competitive markets.

- Licence renewal – from the end of 2005 onwards the FIG can choose to end the licence granted to C&W at a date from the end of December 2010 onwards. It should be made clear to C&W that a competitive tender for a new exclusive licence will take place unless certain conditions are satisfied (explained further below).

- Licence extension – if C&W satisfies certain criteria, their current exclusive licence should be extended by a further 7 years. One criterion the FIG could consider is a clear commitment by C&W to replace and fully fund the Camp radio telephone system.

Regulation

- The FIG should scrutinise more closely the activities of the licensee. This should be achieved by:

  (i) Requiring C&W Falklands to submit an annual performance report to FIG (to the Chief Executive's office) at the end of each financial year.

  (ii) The annual performance report should be presented to the Executive Council and made public following their approval (made public means provided online and in hard copy in the library). A summary of the report should be delivered to all subscribers to the C&W network.

  (iii) The annual performance report would provide information on services, investment, prices, quality of service, profitability and future service plans.

  (iv) The FIG should establish targets, based on benchmarks from other jurisdictions, against which the performance of the licensee would be appraised.

  (v) The licensee should be allowed to submit pleas for changes to its tariffs in the annual performance report, and approval should be granted subject to the performance of the licensee.

Other policy measures

- The FIG should encourage a reduction in the prices for dial-up Internet services.

- The FIG should encourage C&W to scope the feasibility of installing a fibre-optic link between MPC and Stanley.

- The price for dial-up Internet services applying in the evening should commence at an earlier time for residents in Camp, say 8pm.

- The FIG should conduct a review of its spectrum management policy.

Immediate policy actions

Cable & Wireless Falkland Islands should be invited with immediate effect to provide the FIG with a strategic vision for the development of the electronic communications services over the next ten years. This document would discuss how the company intends to manage the challenges it faces on the Islands, and how it foresees best meeting the increasingly demanding needs of businesses, residents and public sector agencies. The document would also assess in detail the financial implications of developing the electronic communications sector on the Islands.

The strategic vision should take the form of a report submitted to the FIG and be made public. I suggest that the following indicative timetable is considered:

January 2005 – FIG invites Cable & Wireless Falkland Islands to prepare a strategic vision for the development of electronic communications services over the next ten years.

February/March 2005 – C&W engages in consultations with key stakeholders to establish needs in the community. The key stakeholders would include: private sector businesses, educational agencies, health agencies, Camp residents, Stanley residents, the military, and government agencies.

April/May 2005 – C&W publish the strategic vision report and a public workshop is held to discuss the report.

June/July 2005 – FIG acts on the strategic vision report and produces a statement of policy to be made public and to be included in the policy objectives of government. The statement would also detail how the FIG would contribute financially to the electronic communications sector.

Annex I Working Visit 18-25 September 2004, Itinerary

Date	Time	Event	Met By	Transport
Sat. 18th	1400 approx	Arrival MPA by LAN Chile, Transport to Stanley	Pete King, Government Secretary	Pete King (PK)
	1600 approx	Arrival at Malvina House Hotel		
	1930	Dinner engagement (Pete & Rosemarie King)		PK
Sun. 19th	pm	Visit to "Estancia" farm	Tony & Ailsa Heathman, also present Nigel & Shirley Adams-Leach from Stanley	PK
Mon. 20th	0830	Meeting with FIG Team – (PKs Office) • Government Secretary – Pete King • Attorney General – David Lang • Financial Secretary – Derek Howatt		
	1000	Meeting with Cable and Wireless	Chief Executive-Richard Hall Mgr Engineering-Dave McLeod Radio Engineer-Nigel Bishop Earth Station Engr. -Chris Harris	PK
	pm	Visit remote re-broadcasting site at Malo Hills	with Richard Hall & Nigel Bishop	C&W PK

Tue. 21st	0800	Fly to Hill Cove for meeting (mid-late morning) with residents and folk from neighbouring farms Overland (approx 1.5 hrs) to Fox Bay to meet folk – meeting mid-late afternoon Overnight at Fox Bay (Councillor Edwards)	Councillor Ian Hansen 41008 Councillor Roger Edwards 42004	PK to airport Cllrs Hansen and Edwards
Wed. 22nd	am 1600 1700	Fly to Darwin/Goose Green to meet folk (mid-late morning overland to Stanley Meeting with Councillors at Gilbert House Meet with Chamber of Commerce at Chamber building	Assistant Manager: Keith Alazia 32246 Chairman: Tim Miller Secretary: Alison Ward	 PK Very near hotel PK

Thur. 23	0830	Adrian Almond – British Forces Broadcasting Service (BFBS provide radio and TV links to/from Stanley)	Meet at Malvina	
	0945	Visit C&W – Tour of facilities incl. Earth Station	Richard Hall & Dave McLeod Earth Station: Chris Harris	
	1115	Meeting with Acting Governor Harriet Hall at Government House - then informal lunch at Seamen's Mission		Short walk
	1530 (depart 13.45)	Meeting at "Hope Cottage" farm with residents from North Camp area	Carol and Terence Phillips 31113 Gillian Williams Bob Alazia Robin Pitaluga (Salvador Farm) Donna Minnell (Moss Side Farm)	PK

Fri. 24th	0900 10.30 then 12.00 1330 1900	General Manager FI Development Corporation – Julian Morris Interview at FI Broadcasting Station (FIBS) Interview at Penguin News Working Lunch with GS AG FS at Malvina Camp (Rural) Education Manager–Richard Fogerty Conservation Ball (Town Hall)	 Sián Ferguson Robbie Burnett & Sharon Marsh	PK
Sat. 25th	1100 1230 1430	Headquarters British Forces at Mount Pleasant Complex (MPC) Lunch at MPC Check in for LAN Chile flight LAN Departure 1625	Command Secretary-Peter Taylor Wg Cdr Chris Stace Lt Cdr John Maskell-Bott With Peter and Pat Taylor at 1 Jones Avenue, MPA	PK