



# 9

## THE SOUTH PACIFIC TELECOMMUNICATIONS DEVELOPMENT PROGRAMME THREE YEARS ON THE WAY

**P.L. Holloway**

Telecommunications Programme Controller at the headquarters of the South Pacific Bureau for Economic Cooperation, Suva, Fiji

### Introduction

The South Pacific Telecommunications Development Programme (SPTDP), based on the South Pacific Bureau for Economic Cooperation (SPEC), has been in existence for three years. This paper reviews progress, and examines the realization of benefits originally seen for the Programme and the development of appropriate technology.

### Background

The South Pacific Forum established the South Pacific Telecommunications Development Programme in recognition of one of its main priorities for development and real economic independence in the region. The Programme is controlled by a Management Group comprised of representatives of the fifteen member coun-

tries of the South Pacific Forum.<sup>1</sup>

This group of mainly newly independent nations suffers from the unique problems of small populations situated in isolated pockets spread over a wide area and separated by vast tracts of ocean. Kiritimati Island in the Line Islands Group is more than 3000 km from Bairiki, capital of the Republic of Kiribati, in the Gilbert Islands group. The Cook Islands is over 1000 km from its nearest neighbour state.

So far, the SPTDP is limited to Kiribati, Tuvalu, Cook Islands and Niue. Some economies of scale might be achieved if it was extended to a wider group of countries. The economic viability of the micro-state is critically dependent on cooperative endeavour. Such states are individually too small to sustain the planning

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<sup>1</sup> The South Pacific Forum as of the Eighteenth Forum meeting in May 1987 comprised: Australia, Cook Islands, Federated States of Micronesia, Fiji, Kiribati, Nauru, New Zealand, Niue, Papua New Guinea, Republic of the Marshall Islands, Solomon Islands, Tonga, Tuvalu, Vanuatu and Western Samoa.

and development infrastructure needed to accomplish economic development. These fragile economies have very limited resources and must make as much as possible of what they have, in order to survive. The South Pacific Heads of Governments' meeting in the Forum saw the bridging of the communications gap, in the most economic manner, an essential prerequisite to trade and industry development.

Since 1973 telecommunications administrations of the South Pacific have met under the auspices of SPEC at the annual South Pacific Regional Telecommunications (SPECTEL) meeting to discuss common problems, review progress in the development of South Pacific telecommunication, and coordinate telecommunications training.

In response to the wishes of the South Pacific Forum a special study of the rural telecommunications needs of the Forum Island Countries was undertaken in 1981-82. As a consequence of this study SPECTEL proposed a cooperative programme of telecommunications development. The 1983 Canberra Forum formally approved the establishment of the South Pacific Telecommunications Development Programme, and the SPTDP Management Group met for the first time at SPEC Headquarters in January 1984.

The first action of the Management Group was to appoint a Programme Controller and establish an office at SPEC Headquarters in Suva for the day-to-day control of the Programme. The running costs of the Programme Control Office, including staff salaries, are jointly met by the Australian and New Zealand governments.

The Management Group meets as and when required to make decisions regarding the Programme. These meetings are generally at SPEC Headquarters in Suva, although one meeting each year is in conjunction with the annual SPECTEL meeting which is held in one of the member countries. The

Technical Working Party of the Management Group meets on an informal basis before each Management Group meeting to discuss technical problems associated with the Programme and to develop solutions.

### **Benefits**

The benefits foreseen for the Programme in 1983 were:

- the provision of a regional focus for shared telecommunications problems and needs;
- the strengthening of bargaining powers, through a unified approach, in respect of telecommunications services and equipment supplies;
- exploitation of economies in the preparation of tender specifications and in the joint procurement of equipment;
- resource saving through sharing of planning and technical skills and expertise;
- resource saving through standardization of equipment and procedures for maintenance, where practicable;
- more effective coordination of technical and management training needs;
- the exploration of economies achievable through common philosophies for holding of spares and facilitating improved test equipment calibration and repair on a regional basis.

Not all of these benefits have been realized to date and it is possible that some may prove to be unrealistic. Equipment standardization benefits presuppose a large single source of funding. Funding has, in fact, come from a number of sources and it is unlikely that a funding source sufficiently large to permit procurement of one type of equipment from one source covering a number of countries will eventuate. However, the preparation of standard equipment specifications by the Technical Work-

ing Party of the Management Group has proved beneficial to many Forum Island Countries (FICs) who have based equipment procurement upon them.

The unified approach has led to a number of benefits in the equipment procurement area where equipment suppliers in the past have shown a reluctance to meet small quantity requirements of individual countries.

One of the most important achievements of the Management Group to date has been the negotiation with the United States' International Telecommunications Satellite Organization (INTELSAT) of an agreement that satellite communications for internal (national) and external (regional and international) telecommunications purposes could be operated through existing international service earth stations using the same satellite that provides their international telecommunications. This results in a major capital cost saving by eliminating the need for a second main centre earth station.

### Technology

During the 1970s substantial improvements were made in the international connection to most South Pacific countries. With the exception of Tuvalu and Niue, countries were linked into the International Satellite Network by INTELSAT. However, the benefits rarely extended beyond the immediate environment of the centre of government. The main thrust of the SPTDP is to improve rural telecommunications and extend the benefit of international standard telecommunications over the whole of the country.

The improvement of rural telecommunications will inevitably require further development of the main centre and international networks, and automating of networks is essential if the benefits of modern transmission systems are to become available.

The technology being used to de-

velop the network differs throughout the region: in the archipelagic countries of Papua New Guinea, Solomon Islands and Vanuatu, terrestrial radio can meet the needs of many outer island communities. The physical characteristics of many over-water paths, however, put them beyond the range of line-of-sight radio at least on the basis of conventional propagation theory. The latter is based to a large degree on temperate climate conditions. There is a lack of authoritative data on transmission in tropical areas. The Management Group has had to institute its own studies on line-of-sight transmission in the South Pacific environment.

In most parts of the South Pacific, distances are well beyond the range of terrestrial radio. Bearing in mind that non-optical radio systems such as Tropospheric Scatter, and High Frequency ionospheric, do not produce circuit quality that is internationally acceptable, satellite communication is the only feasible long-term solution.

### Satellite communications

The provision of terrestrial telecommunications, that is, transmission by air or microwave, is more costly per individual telephone circuit in sparsely populated areas than it is in densely populated areas. Economies of scale occur in trunking large numbers of circuits into the same bearer whether it is microwave radio or cable. The cost of terrestrial bearers is proportional to length. In the sparsely populated South Pacific, trunk circuits are costly on two counts: they are both thin and long.

The answer of course is to use satellite communication which is not distance sensitive. Although there has been a steady drop in the cost of providing circuits since satellite communications came into being, the technology is still expensive and the operating expenses make it costly to serve small communities.

The most expensive portion of the day-to-day operating cost of satellite service is the Space Segment charge, the amortized cost of placing that expensive solar-powered microwave repeater station in the geostationary orbit, and keeping it on station. INTELSAT charge \$US6300 per year for a continuously available telephone circuit. This is the cost of permanently assigned circuits which are only producing revenue when they are in use. For a small island community of fewer than a hundred people living in a bare subsistence economy this could be too much.

There is, however, a major operating cost saving to be had from the ability to operate domestic, regional and international telecommunications through the one satellite: this is by installing a Demand Assignment Multiple Access (DAMA) switch. With DAMA, the circuits through the satellite are only assigned and charged for while they are in use and earning revenue as working telephone connections.

Further advantage can accrue from the sharing of a pool of demand assigned circuits amongst users with differing peak demand times (such as domestic and international), and spread across different time zones. By sharing a pool of circuits amongst a diversely spread group, the number required can be reduced to a tenth of the number of permanently assigned circuits.

These techniques promise to bring the cost of providing telephone circuits by satellite within an affordable range for small communities.

### Progress to date

The promotion of the Programme with aid donors, in the early stages, suffered from the lack of detailed planning and inadequate economic justification. Network planning and financial analysis for each country participating in the Programme is now largely complete and the current 3-Year Funding Schedule contains country projects with a total value of \$US38 million which are generally well documented.

The Management Group is now studying the concept of a regional body to manage satellite communications for the countries of the region using DAMA technology. The DAMA switch which allocated satellite circuits linking any two earth stations on demand, is centrally located but not necessarily in any one of the member countries. As well as controlling the routing of circuits the DAMA switch will provide circuit accounting information necessary for members to collect revenue due to them. The concept has some potential problems of an institutional nature in relation to the autonomy and integrity of national telecommunications, and these are being studied.

### Conclusion

The first three years of the Programme have been largely occupied with network planning, the study of satellite systems and fund raising.

With the development of a practical and affordable South Pacific satellite system, the prime objective of improving telecommunications in the rural areas of the FIC is within the realms of possibility.