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Working with WARC-92

Pragmatism and reciprocity needed

Speaking at the Third *Satel Conseil* Symposium (Paris, 28-30 September 1992), ITU Secretary-General Pekka Tarjanne said that recent developments in radiocommunications would completely change the way in which we use telecommunication and broadcasting services during the next 20 years. "Every effort must be made to avoid a proliferation of incompatible systems. When incompatible systems are permitted, the results for users, manufacturers and service providers alike can be disastrous, especially in terms of cost and time. The challenge facing the ITU is to develop approaches to spectrum allocation and standardization which secure the benefits of common global approaches, but leave plenty of room for technology and market-led innovation."

Tarjanne evoked the problem of the present excessive complication of the Radio Regulations. The frequency spectrum is a scarce natural resource belonging to humanity and must be used in a co-ordinated and harmonized manner. Although "regulation" is now sometimes regarded as a dirty word, the efficient management of the frequency spectrum and the geostationary-satellite orbit nevertheless requires some regulation. The ITU's Voluntary Group of Experts (VGE) on the simplification of the Radio Regulations had met the previous week. The new principle should be to regulate only what has to be regulated and to simplify procedures.

Mohamed Harbi, member of the IFRB, emphasized that many of the new allocations made by WARC-92 comprised bands which were already occupied and not yet available for new services, a situation which complicated the problem of sharing. He had observed unprecedented commercial pressure at WARC-92. The Conference had been a battle between the big users of the radio spectrum where the smaller countries had little weight. Although most participants expressed satisfaction after the Conference, it remains to be seen whether this is real. Hopes of world allocations have been dashed and the problem of the "footnote virus" has been exacerbated. The solution of this latter problem, said Harbi, will require radical changes to the Regulations; a mere face-lift will not do.

Although there was the usual talk about market forces and free competition being the panacea for all ills, it seems that few countries are ready to apply this philosophy. For example, Olof Lundberg, Director-General of the International Maritime Satellite Organization, revealed that it was not permitted to use an INMARSAT terminal in the United States. Another example of transborder difficulties was experienced by *Euteltrac*, the two-way messaging system for vehicles with integrated position reporting of the European Telecommunications Satellite Organization. National laws are often ill-adapted to cope with this type of service. Nevertheless, EUTELSAT has now obtained authorization for the service in 24 countries.

Mobile communications

As at WARC-92, non-geostationary satellite systems were a major item of discussion. Pietro Lo Galbo (European Space Agency-ESA) said that optimum coverage of the Northern hemisphere would be obtained by medium- to high-orbit (M-HEO) systems which could provide a high elevation angle and work with small hand-held terminals. ESA's *Archimedes* system configured for global coverage would use 14 satellites in medium-altitude circular orbits with a six-hour period and with a minimum elevation angle of 30°. Start-up costs could be limited by having an initially reduced coverage area using only seven satellites.

The *NTT* mobile satellite communications project, described by Shuichi Samejima would operate using the *ETS-6* satellite in the 2.6/2.5 GHz band which was allocated to Region 3 by WARC-79. At present, only 25% of the surface of Japan is covered by terrestrial mobile service; the rest will be done by satellite.

Financing start-up costs are considered to be a critical factor and systems capable of starting with a regional coverage at a lower cost have a considerable advantage in this respect.

Michael Tyler (Booz, Allen & Hamilton) noted that the market for these services is segmented. Whilst all users are very sensitive to reliability and ease of use, as the user-base expands, we shall rapidly exhaust those who are willing to pay a high price. To obtain any substantial increase in demand, much lower prices will be needed.

Digital broadcasting

The new allocations for digital sound broadcasting in the 1452-1492 MHz band would only be available as from the year 2007 but satellite service could start on an interim basis in the upper 25 MHz of the band. Terrestrial digital broadcasting stations may be put into service during the interim period subject to co-ordination with the administrations which could be affected. This is the way Canada is going where digital broadcasting is supported by all major players and a National Task Force has

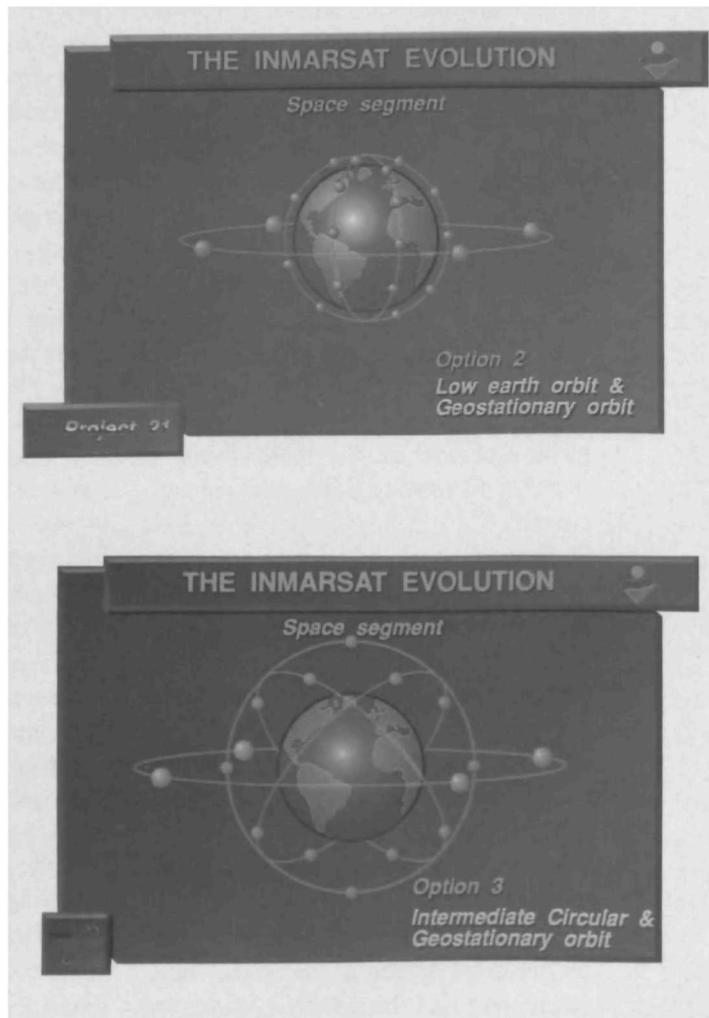
been created to encourage the introduction of digital audio broadcasting (DAB) in the L-band which, said François Conway (Canadian Broadcasting Corporation-CBC), would become a reality in 1995-1996. The Canadian government has made available a grant of 1 million Canadian dollars to help launch this service.

In Japan, satellite sound broadcasting had started in the 12 GHz band and 18 stereo programmes were now being broadcast, said Takehiro Izumi, Director General, Technical Research Laboratories of the *NHK*. As from December 1992, programmes would be encrypted.

As for the practical introduction of DAB in Europe, Daniel Pommier, Director of the *Centre commun d'études de télévision et des télécommunications* (CCETT), said that European standardization was well advanced. In 1993 the first integrated circuits intended for use in commercial receivers would be available.

In Germany it is intended to replace the present FM broadcasting by DAB because of the higher quality of digital sound. Frank Müller Römer, Technical Director of *Bayerischer Rundfunk*, estimated a 15-year period of parallel working of the two systems after which FM would be totally replaced by DAB. The terrestrial service would start in 1995 and use the VHF band since the 1.5 GHz band would be too expensive, costing roughly ten times as much as satellite DAB, which would not, however, be available until 2007.

The delay in the spectrum becoming available seems to be the main brake in introducing



Evolution of INMARSAT space segment: two of the options under consideration

(INMARSAT)

satellite DAB. Apart from onerous start-up costs (conception, construction and launch of the satellites), satellite broadcasting operating costs are 20 times lower than for terrestrial broadcasting. Jean-Louis Lafleur, *Radio-France*, gave the annual operating cost of *France-Inter* on MF as 66 million French francs whilst the cost of high-quality stereo direct broadcasting from *TDF-1* is only 3.3 million. The time needed to get the service started also favours satellites which, once launched, can give immediate total national coverage whereas it took five years for *Télédiffusion de France* (TDF) to build up its terrestrial broadcasting network which still covers only two thirds of the population.

Satellites: an alternative to short-wave broadcasting?

Extra spectrum was not made available by WARC-92 to relieve the overcrowded HF broadcasting bands. The introduction of single-sideband broadcasting, with its better spectrum and power efficiency, had been foreseen by HFBC-87, but it had received a cool reception from broadcasters and was now a "dead duck", said George Waters, Technical Director of the European Broadcasting Union.

The question now, said Waters, is "Can digital audio broadcasting (DAB) be a candidate for international broadcasting?" A new frequency allocation had been made, there was a universal standard for the transmitting characteristics, and receivers could be manufactured cheaply and sold for less than 100 United States dollars. DAB was therefore a viable alternative but, said Eric Baptiste, Director General of *Radio France Internationale*, HF broadcasting could not be abandoned within the next 20 years.

Donald Messer, Voice of America (VOA), also stressed the potential economies of satellite broadcasting compared to short-wave but, in the initial stages, the cost per listener was high owing to the small number of receivers. VOA, said Messer, was ready to lease or purchase channels from satellite operators but the changeover for interna-



Palapa earth station at Bognor, West Java, Indonesia

ITU 920029
(ITU/Jean-Marie Micaud)

tional broadcasting from HF to satellite would be gradual. However, it is only a small segment of the total market for DAB.

Mohamed Harbi asked when broadcasters would be ready to liberate some of the frequency bands now used for terrestrial broadcasting since the DAB allocation had been obtained with the support of the developing countries. Broadcasters were of the opinion that they could not give up spectrum until a viable alternative was in place.

According to Waters, the changeover to DAB is likely to take between 20 and 40 years.

HDTV: wide or narrow band?

In a session on wide- or narrow-band HDTV, it was noted that digital technology developments, which allow the transmission of five times more information in the same band, would have a great impact. But the real bottleneck in developing HDTV,

said Gianfranco Barbieri (RAI), is the display. The narrow-band/wide-band debate is academic if this problem is not solved. Others thought that the distinction would vanish by the time the new allocations become available.

The United Kingdom finds the existing 12-GHz plan commercially unattractive, said Gary Tonge, Controller of Engineering at the Independent Television Commission. Spain intends, in the short term, to start satellite broadcasting in HD-MAC from Hispasat in conformity with WARC(BS)-77. In the longer term, said Julián Seseña Navarro, Telecommunications Systems Manager at Hispasat, they will switch to wide-band HDTV.

Many countries would prefer to use the 12-GHz band for wide-band HDTV which would require a revision of the WARC(BS)-77 plan. In any new plan the opportunity should be taken to rationalize the use of the FSS/BSS bands. In Region 2 the possibility exists under WARC-83 of combining channels in the 12-GHz band.

Are national satellite systems still viable?

There is now a strong tendency towards regional satellite systems; a number of national satellite projects have been abandoned in favour of the use of regional systems whilst certain existing national systems are becoming more and more *de facto* regional systems. The arguments in favour of regional systems were summed up by Lourdes Saralegui, Executive Vice-President, Alpha Lyracom Space Communications Inc., who said they offer a larger market from which to recoup significant investment and operating costs. "Dedicated communications satellite systems limited solely to the domestic market have a smaller market from which to amortize total costs leading to a higher price on a per transponder basis. Higher prices mean less use; less use, less revenue..."

The decision to turn Indonesia's *Palapa* system into a regional system had been taken in order to remain competitive in the face of the emergence of national satellite systems and privately-owned regional systems, said Taufik Akbar, Senior Engineer, *Palapa Satellite Planning and Operation*. In fact, *Palapa* had been used as a regional system already for 16 years. Opening ownership of the system to foreign capital within the region, foreseen for 1993, would be a logical step forward. Such a decision goes hand in hand with the construction and launch of the next generation *Palapa-C* satellites, the first of which is due for launch in 1995 and will have a wider coverage than existing *Palapa* satellites. However, he did not think that this should be considered as a model for other national satellite owners since the *Palapa* decision had been taken in a specific geographic and geopolitical context.

National satellite systems appear to be concentrated mainly in big countries, especially those with areas of low population density (Canada), island countries (Indonesia, Japan), or in countries with outlying provinces (France). But even here economic pressures were pushing them towards regionalization.

Developing the markets

WARC-92 laid the foundations for new mobile and sound broadcasting systems and HDTV. In the light of what had often seemed a conflictual situation between Europe and the United States at the Conference, what should be done to render the development of these markets at the international level as useful as possible for the user?

Walda Roseman, Director, Office of International Communications, Federal Communications Commission (FCC), replied that it is a human characteristic to distrust those we do not know very well, to distrust our competitors and potential collabora-

tors. Although there had been a certain lack of understanding at WARC-92, she thought that the final result had been that both groups had emerged from the Conference with most of what they needed. The Conference had thus been successful but we did not want to repeat the experience.

How should we collaborate in future? She took low Earth orbit (LEO) satellite systems, inherently global in scope, as an example. This is a high risk enterprise, a new service for which there exist no receivers yet. Satellites have still to be launched which involve inevitable uncertainties. Investors compare this unfavorably with terrestrial services. In addition governments could erect hurdles too high for the new services to surmount. "The United States view", said Roseman, "is that governments cannot and should not be designing the markets for many of these new services. The best we can do is be certain that we have done the most with the spectrum resources we have been given to set up a competitive framework for current applicants and future entrants, and then coordinate so there is minimal technical interference. Then step back and see what the entrepreneurs, each of whom have an interest in getting optimal interoperability and maximum customer satisfaction, can do with local partners, clearing regulatory hurdles and establishing to a large part the standards needed to work to the terrestrial infrastructure." Roseman concluded by saying that we should try to understand each other and be as pragmatic as possible.

In contrast to this was a statement made earlier by Timothy Howells, DGXIII, Commission of the European Communities, who warned nations with closed markets that there would be no opening of the European market without reciprocity. Howells also qualified as "unacceptable" any attempt by a single nation to regulate a world service. - *Michael Woolley.*