Review of Canadian Mobile Satellite Systems Institutional Arrangements Policy

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ABSTRACT

Development of institutional arrangements policy for maritime, land and aeronautical MSS is an integral part of the Canadian telecommunications policy process. An ongoing activity in that process is fitting of MSS institutional arrangements policy within the confines of the 1987 Canadian Telecom Policy Framework. Making sure the fit is correct is a major task at present because technology seems to be driving service demand at rapid growth rates, particularly in the case of land MSS. This growth is stimulating policy and regulatory development efforts to keep pace. In Canada, this is happening in four planned MSS aplications areas: Canada-U.S. transborder (immediate), Teleglobe Canada Inc. international aeronautical MSS (1990/91), Telesat Mobile Inc. EMDS via INMARSAT (1990) and MSAT (1993/94). The need for an up-to-date MSS policy in these areas is emphasized by related developments in the U.S. and elsewhere. It arises because of the growing number of market initiatives proposing North American rather than Canada-only or U.S.-only coverage, such as INMARSAT, Geostar, OmniTRACS and Starlink.

PREAMBLE

1. Mobile communications has benefitted enormously from the many important technology advances which have increased its worldwide public acceptance. Phenomenal market growth is being observed in the cellular mobile industry and its spin-offs, for example, in personal radio services. Riding this wave of popularity are mobile satellite services (MSS), principally in vehicle positioning and cargo status monitoring for the trucking industry.

PURPOSE

2. This paper reviews the current status of Canadian MSS institutional arrangements policy within the context of the more general 1987 Canadian Telecom Policy Framework and makes proposals for MSS institutional arrangements.

BACKGROUND

3. The events leading to commercially viable MSS in Canada have all occurred within the last thirty years. For example, Canada's Space Program was initiated in the early 1960's and continued on through the 1970's. In 1969, Telesat Canada was founded as Canada's commercial fixed satellite service provider. In 1972, the Department of Communications developed the concept of the Canadian multi-purpose mobile communications satellite called Musat.

4. In 1971, the World Administrative Radio Conference (Space WARC-71) first allocated spectrum (in the 1500 MHz L-band) to maritime and aeronautical MSS. In 1975, the Departments of Communications, Transport and External Affairs, (with the support from the then Crown Corporation, Teleglobe Canada) participated in the establishment of the first maritime MSS by the International Maritime Satellite Organization (INMARSAT). In 1980 to 1984, working with the U.S. National Aeronautics and Space Administration (NASA), the Department developed its generic MSS concept known as MSAT.

5. In 1984, the Department transferred development and implementation of the MSAT technology to Telesat Canada which, in April 1987, set up Telesat Mobile Inc. (TMI) for the purpose. TMI was not, however, activated until December 1988.

6. In 1987, the Mobile WARC allocated 7MHz of spectrum to MSS in the L-band. Also in 1987, the Department introduced its Telecommunications Policy Framework.

7. In 1988, INMARSAT moved to provide aeronautical and land MSS and the Government of Canada signed an international agreement permitting the use of INMARSAT in territorial seas and ports. Also in 1988, the Minister of Communications declared TMI the sole provider of MSS capacity in Canada.

8. In 1989, a number of entities worldwide, including Teleglobe Canada, signed aeronautical MSS agreements with the Société internationale de télécommunications aéronautiques (SITA) to provide air traffic control (ATC), air operations (AOC), air administration (AAC) and passenger communications services (APC). Also in 1989, two U.S. companies emerged to provide dedicated radio determination satellite service (RDSS) and land MSS for the North American trucking industry. Subsequently, Canadian companies, wishing to extend these services into Canada, set up commercial arrangements with the U.S. operators. They have been licensed in Canada to provide services on an interim basis until Canadian facilities are available. This is of particular concern to Canada in that transborder services are also involved. The two main companies implementing this RDSS in the U.S. and southern Canada have already moved to provide similar services in Europe; and one of the companies is planning to expand to North Africa.

REVIEW OF ISSUES AND POLICIES AFFECTING CANADIAN MSS

Past MSS Policy Decisions

9. MSS background in Canada evolved in the context of a variety of policy and legal intruments. These ranged from the 1972 and 1982 Canada-United States Transborder Agreements through the various long-standing international conventions, operating agreements and accords to the 1984 agreement between the Department and Telesat on the terms and conditions of transfer of the MSAT technology.

10. The 1987 Telecommunications Policy Framework distinguished between carriers which owned and operated facilities (Type I) and those providing services by leasing that capacity (Type II). In 1988, in declaring TMI to be the sole provider of MSS satellite capacity within Canada, the Department excluded other Type I carriers from owning and operating the MSS satellite facility.

11. Similarly, in the provision of Canada-overseas space segment facilities, Teleglobe Canada is the relevant Type I MSS carrier. It is the sole provider of overseas MSS satellite capacity. This currently applies to INMARSAT. Teleglobe's monopoly on Canada-overseas service is subject to review in 1992 by the Government of Canada under the terms of its 1987 privatization.

12. The policy objectives of TMI and Teleglobe Canada, on entry into the MSS market in Canada, are consistent with the DOC Telecom Policy Framework. Hence, if either were to enter each other's market as a Type II carrier, that is, in the provision of domestic or international MSS, it would have to lease capacity from the other as the sole Type I domestic or international facilities provider.

13. Under authority of the Radiocommunications Act, network control is the responsibility of the Type I carrier.

14. The Department has authorized TMI to develop a generic MSS system at L-band with the proviso that any air traffic control (ATC) requirements are fully accomodated within the System. This is in order to make most effective use of the valuable spectrum-orbit resource allocated to MSS at the Mobile WARC in 1987. It will also allow this new type of service to develop in a way responsive to Canadian requirements in the 1990's.

15. Under long-established terminal attachment and system interconnection rules, land, aeronautical and maritime MSS subscribers would be allowed to own or lease mobile earth stations. Authorization of these terminals under the Radiocommunications Act would be done by DOC in accordance with existing radio regulations. In the aeronautical and maritime sectors, additional safety regulations might also have an impact on the relevant radio equipment standardization.

16. The approach to MSS policy development in Canada recognizes the trend towards integrated North American MSS. This trend is being dictated by market pressures, particularly in the case of the Canada-U.S. transborder trucking industry.

17. TMI is not yet in a position to provide its own MSS satellite facilities. Until then, it will provide interim MSS using alternate capacity which it must lease from another carrier. For example, for its "Road KIT" Early Mobile Data Service (EMDS) it plans to lease capacity from Teleglobe Canada on an INMARSAT satellite. TMI is permitted to offer interim MSS in this way on condition that its subscribers migrate to the Canadian MSAT when it becomes available.

CURRENT MSS ISSUES

18. Different in some respects from WARC Mobile '87 spectrum allocations, the Canadian spectrum policy document, SP1530MHz, allocates separate portions of the L-band to generic MSS with an exclusive aeronautical MSS allocation (sandwiched between them). The air traffic control portion of the aeronautical MSS has priority access to the upper portion of the generic MSS alocation. TMI must satisfy the Departments of Communications and Transport that the mechanisms exist to provide priority ATC, if and when required. Aeronautical public correspondence does not have the same priority and can be accomodated anywhere in the generic MSS bands.

19. In accordance with the above and the 1987 Telecom Policy Framework, Canadian-registered aircraft normally operating only on domestic routes would use Canadian MSS facilities. Foreign-registered aircraft normally operating on international routes would use either Canadian or foreign MSS networks; the question arises in this case as to what carriers and systems these aircraft would be required to use while in transit through Canadian airspace or while terminating flights in Canada. The Proposals at the end of this paper expand on the above notions and deal with how to handle such situations.

20. American MSS systems (such as the Geostar and Qualcomm systems) are currently authorized by the FCC to provide position determination and one/two way short duration messaging to, for example, the trucking industry in the continental U.S.. While these systems do not have the capacity to provide full two-way voice communications, they do have the capability of covering southern Canada. The Canadian company SaTel is the sales agent for prospective Canadian users of the Geostar Positioning Corp's System. Qualcomm's Canadian subsidiary, Qualcomm Communications Canada (QCC), is to offer service through Telesat Canada via a U.S. fixed satellite in eastern Canada and via Anik C in western Canada. After launch of Telesat's Anik E, all-Canada coverage will shift to these facilities.

21. Licensing measures exist to prevent potential Canadian subscribers to U.S. MSS dealing directly with the U.S. carriers involved. These licensing measures are based on the principles of Canadian carriers not being bypassed and MSS being provided in accordance with the Telecom Policy Framework.

22. There are agreements on transborder <u>fixed</u> satellite services with the U.S. Government that can be used as models to provide for transborder MSS. No reason is foreseen why the spirit of these "fixed satellite" agreements should not also apply to transborder MSS. Action to develop transborder MSS agreements are currently underway.

23. Two Canadian policy issues of importance at present are "Compatibility between different MSS systems" and "the extent of equipment standardization". In regard to the compatibility issue, there are some

basic limitations in the extent to which compatibility may exist in the future. One limitation relates to the use by terrestrial land mobile systems of VHF/UHF spectrum as opposed to the cellular/MSS employment of higher frequency bands; this makes it extremely improbable that compatibility standardization would ever be attempted between these two types of technology.

24. While the notion is accepted today that migration from foreign service facilities to Canadian facilities is required, the cost of implementation of such a policy, when Canadian facilities become available, is an important issue. This could be of particular concern to fleet users such as in the trucking industry.

25. In addition to the "cost" issue in migration to Canadian MSS capacity, there is the question of satisfactorily having to define "equivalence" between the new Canadian facilities and the U.S. (or other) facilities from which migration must be effected. The terms and conditions of evaluating "equivalence" would also have to be clear and unequivocal. This could prove particularly difficult because of differences in features offered on one system relative to another and the value judgements required in comparing one feature with another. For example the potential of current U.S. MSS to provide more accurate position/location information compared to the proposed 1993/94 MSAT system is one such feature. This would have to be looked at to determine whether equivalence exists and whether migration in such a case might be reasonable at the time.

26. A marketing question is the need for either TMI or Teleglobe Canada to become a Type II carrier when it wants to enter the market of the other acting as the Type I carrier of record for the particular type of MSS. For example, if Teleglobe wishes to provide domestic land MSS via INMARSAT, according to the 1987 Telecom Policy Framework, it must lease the INMARSAT capacity to TMI (the Type I carrier) and then lease it back as the end-user service provider (a Type II carrier). Further, if Teleglobe wishes to provide domestic land MSS via U.S. satellites, TMI would have to lease the required capacity from the U.S. carrier and release it to Teleglobe Canada.

27. Another facet of the same question lies in the scenario where Teleglobe is permitted to provide domestic land MSS (as a Type II carrier) using, on an interim basis, the INMARSAT System. The question arises as to whether it follows that TMI should be permitted on a quid pro quo basis (as a Type II carrier) to provide domestic aeronautical MSS using the INMARSAT system. This issue is made more complex because of Teleglobe contractual arrangements with France, Australia and SITA in this regard. It raises the further question of whether TMI could provide such a service without the permission of ICAO or the other parties to the Teleglobe accord, even where there is no international MSS involved. It is apparent that, in the event that TMI would be permitted to enter this market, the required INMARSAT capacity would have to be leased from Teleglobe Canada for the purpose.

MSS INSTITUTIONAL ARRANGEMENTS UNDER CONSIDERATION

28. On the basis of the many complex considerations impacting on provision of MSS in Canada as enumerated above, the following institutional arrangements are under consideration by the Department of Communications:

a) General:

- Authorized carriers in Canada (TMI and Teleglobe as Type I carriers) to provide satellite capacity to end users and end-user service providers

  End-users and Type II carriers required to obtain access to MSS capacity only from Type I carriers

- In the absence of Canadian facilities, use of non-Canadian MSS facilities to be permitted. Migration from non-Canadian facilities to the equivalent Canadian facility to be required when the latter becomes available

- The MSS satellite transmitter/ receiver and associated control transmit/receive earth stations to be subject to licensing

  Mobile earth station licensing likely to be put in place similar to that currently applicable to terrestrial mobile stations

b) Transborder MSS:

- Extension of the 1982 Canada-U.S. transborder agreements to cover MSS and associated satellite services

- Appropriate arrangements to cover roaming of mobile earth/ stations across the Canada-U.S. border in either direction.

c) Aeronautical MSS

- Canadian aircraft normally flying:

  i) on domestic routes to use the TMI MSAT MSS System

  ii) Canada-U.S. routes to use the proposed TMI or AMSC MSAT MSS System with detailed arrangements to be worked out between the two companies

  iii) on international (overseas) routes to use the TMI MSAT or alternate (INMARSAT) with the choice of facilities to be on a normal competitive business basis

- Foreign aircraft normally flying between Canadian and overseas points to use the TMI MSAT or alternate (INMARSAT) System with choice of facility to be on a normal competitive business basis

d) Compatibility Standardization:

- Possible establishment of national/regional MSS standards

- Possible TMI MSAT/AMSC standardization

- Current Canadian MSS SaTel subscribers to be made aware of the possibility of compatibility problems (including cost and inconvenience) required to migrate to MSAT at the time it becomes available.

  Similarly, for TMI's EMDS service versus other MSS via INMARSAT or via U.S. MSS systems

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