



सत्यमेव जयते

Government of India

New Delhi

March 2011

REPORT OF THE HIGH
POWERED REVIEW
COMMITTEE ON
VARIOUS ASPECTS OF
THE AGREEMENT
BETWEEN ANTRIX &
M/s. DEVAS
MULTIMEDIA PVT.
LTD.

B.K.CHATURVEDI

*PROF. RODDAM
NARASIMHA*

VOLUME I

(Main Report)

GOVERNMENT OF INDIA

New Delhi
12th March, 2011.

The Government appointed a High Powered Review Committee, comprising Shri B.K. Chaturvedi, Member, Planning Commission and Prof. Roddam Narasimha, Member, Space Commission, on 10th February, 2011 to consider the following issues and asked it to submit its Recommendations to the Prime Minister within a period of one month:

(a) (i) To review the technical, commercial, procedural and financial aspects of the Agreement between ANTRIX and M/s Devas Multimedia Pvt. Ltd., taking into account the report of internal review conducted by the Department of Space,

(ii) To suggest corrective measures, and

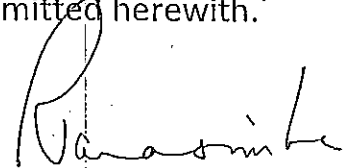
(iii) To fix responsibility for lapses, if any.

(b) In the light of the above, to review the adequacy of procedures and approval processes followed by ANTRIX, ISRO and Department of Space, and to suggest improvements and changes, taking into account the review mandated by the Space Commission at its 117th meeting, held on 2nd July, 2010.

2. In pursuance of the above, the Committee had extensive discussions with various experts and ISRO officials at Bengaluru/New Delhi and also considered various documents. Based on these, the Committee has made its recommendations. The Report is submitted herewith.



(B.K. Chaturvedi)
Member, Planning Commission



(Roddam Narasimha)
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EXECUTIVE SUMMARY

The Department of Space (DoS) and Space Commission were set up in 1972. Subsequently, an Inter-Ministerial INSAT Coordination Committee (ICC) and a Technical Advisory Group (TAG) were set up in 1977-78 to supervise and monitor the INSAT satellites. In 1992, ANTRIX was set up as a corporate arm of DoS with Secretary of DoS as ex-officio Chairman of the company.

2. Development of Space services for Television, remote sensing and data transmission in public and subsequently in private sectors required a policy for usage of INSAT satellite by non-government users. The SATCOM Policy incorporating norms, policy and procedures was approved on 12th January, 2000 by Cabinet. It mentioned regulatory approach from Ministry of Information and Broadcasting and Department of Telecommunications (DoT). INSAT Coordination Committee (ICC) was authorized to earmark at least a certain percentage of INSAT transponders capacity for use by non-governmental users. ICC met 78 times during 1978-2004. No meeting has taken place between 2004 and 2009. Responsibility for convening ICC lay with Secretary, DoS and Director (SCPO), who are Chairman and Secretary respectively of ICC.

3. Orbit-spectrum is a scarce resource and is allocated by ITU based on international competition. The allocation is based on the principles of 'first-come-first-served' and 'use or lose'.

4. A large number of non-governmental users have benefitted from services provided by Indian satellites. Under the present policy, foreign satellite transponders have been made available, when INSAT was not able to meet demand. The users have to pay transponder leasing charges to DoS, apart from entry fee, spectrum charges, service license fee, NOCC charges etc. to Ministry of I&B/DoT for providing services to consumers.

5. Technology for Multimedia Mobile Services based on Space platform was evolving in 2004-05. A proposal was given by M/s Forge Advisors of USA (FA-USA) to ANTRIX/ISRO for a Joint Venture (April, 2004) as a follow up of the MoU signed between ISRO and FA-USA in July, 2003. M/s Devas Multimedia Pvt. Ltd. was set up by FA-USA as an Indian company on 17th December, 2004. After extensive discussions with them, which helped improve several parameters for ANTRIX, an agreement was approved by the Board of Directors of ANTRIX on 24th December, 2004, and signed on 28th January, 2005. It provided for transponder leasing by ANTRIX to Devas for 90% of the satellite transponder capacity in S-band.

6. The Space Commission approved the project for making the satellite GSAT-6/INSAT-4E in May, 2005. The Cabinet, thereafter, approved it in November, 2005. Space Commission later approved in October, 2009 a follow up project on the satellite GSAT-6A. The Space Commission and the Cabinet were not informed of the ANTRIX-Devas agreement or its implications for usage of spectrum for Defence or security purposes. Proposals of GSAT-6 or GSAT-6A involving use of satellite capacity were never discussed in ICC nor authorized by it. In the TAG, a brief mention was made in October, 2004 about the ANTRIX-Devas agreement but no approval was sought.

7. The agreement signed with Devas (January, 2005) had provided for two satellites PS1 and PS2 (Devas exercised its option on PS2 in 2007). This agreement had several weaknesses. If the project was successful, the transponder leasing revenue would be able to give an IRR of above 10%. However, there were other risks involved. The agreement was signed with a company which had a paid-up share capital of only Rs.1,00,000 (January, 2005). ANTRIX/ISRO had to launch and manage the satellite and a penalty was to be paid by them, if they did not adhere to the agreed time-schedule. ISRO committed itself to launch of satellite incurring the risk of searching for alternative users if Devas failed to develop the new technology for mobile services. While ISRO was to invest about Rs.800 crore in two satellites and their launches, it provided 90% of the satellite capacity for Devas, and the use of about 60 MHz of S-band spectrum in

the 2500–2690 MHz band. This left very little spectrum with ISRO for any strategic or societal use in future or for other multimedia mobile service operations. Any other MSS use in the band would not be as efficient due to interference of signals. Defence requirements were not fully considered while allocating the spectrum. The spectrum allocated for the Devas project seems disproportionately large considering that reportedly in US, Korea and Japan, 20–25 MHz of spectrum in this band had been used for similar services.

8. Concerns on cheap selling of spectrum to Devas have no basis whatsoever. Space spectrum is not comparable to terrestrial spectrum. Devas was also required to obtain licenses from DoT/I&B for providing services to customers and would have to pay, apart from Transponder leasing charges, other charges which would be determined by Telecom Regulatory Authority of India (TRAI) based on their consultation mechanism.

8 (a). The functioning of DoS should be more transparent on the one side with Space Commission and Government and the other with ISRO centres. Formal discussions on ANTRIX/DoS projects should be made more transparent within ISRO by introducing a formal review process with all stakeholders.

9. While the agreement with Devas does not indicate any short-selling of spectrum, it does, however, indicate certain financial and strategic gaps. Chairman, ANTRIX Board/Secretary, DoS, Director, SATCOM, ISRO, Member (Finance), Space Commission were primarily responsible for the lapse. Chairman, ISRO/ANTRIX Board who finalized several areas of agreement must also share the responsibility for some of the gaps.

10. Space spectrum efforts have to be made to augment for national use. A national policy which takes care of country's strategic/commercial and societal needs and takes an integrated view of space and terrestrial segments is necessary. A Committee under Chairman, TRAI/Secretary, DoS

may look at these issues and give its considered views after extensive discussions.

11. Reforms are required in the Space Commission, ISRO and ANTRIX to meet the growing requirements of Space activities. Space Commission must meet at least 4 times a year and be fully briefed on activities of ANTRIX at least twice a year. It must also be briefed about the new and emerging technologies which ANTRIX/ISRO may negotiate and develop, the risks inherent in the process, and the implications for societal, Defence and commercial needs. There should be full disclosure on the above issues.
12. ANTRIX must be restructured with a full-time Chairman & Managing Director and a Board, including Joint Secretary/FA and other Directors. To monitor and ensure effective coordination, a Committee under the chairmanship of Secretary, DOS/Chairman, ISRO should be formed which may include 3 representatives each from ANTRIX and ISRO and may meet at least once a month or more often, if necessary.
13. Good corporate governance practices should be introduced, including rotation of independent Directors every three years (with one option to get re-elected), setting up of Audit Committee of independent Directors, integrity pact with persons/vendors.
14. Financial and internal audit structures of ANTRIX should be strengthened by training re-orientation of internal Financial Advisers and updating of manual of internal audit.
15. Costing system of ANTRIX/ISRO is weak and needs to be strengthened in consultation with Chief Adviser (Cost) in Ministry of Finance. This may include the costing of various services of ISRO. Legal Adviser/FA (Internal Law) may be appointed and another Legal Adviser/FA (Commercial Law) for contracts, arbitration etc. may be retained to meet the growing legal/financial challenges of national/international business.

Executive Summary

16. The regulatory functions of SATCOM office should be separated from the programme and policy functions and the re-organization of the present SATCOM Programme Office may be done with a trifurcation.
17. The transponder leasing functions are commercial in nature and may continue to be done by ANTRIX. The leasing may be done in accordance with the guidelines approved by the ICC. The SATCOM Policy and such other guidelines issued from time to time and the administrative arrangements/procedures may be placed in a properly organized website of DoS.
18. On all matters of policy as well as issues involving international or diplomatic implications, the corporation should obtain formal clearance from DoS.
19. Commitments and contracts involving resources and funds of the Government/DoS should be got formally approved by the DoS before execution. This is necessary because of the integral relationship between DoS/ISRO and the ANTRIX when it is functioning as an extended arm.
20. The clearances from DoS may be obtained where there are any international implications of a project or resources and funds of Government are being committed. For funds beyond Rs.75 crore investment by ANTRIX or important/strategic projects, approval of the Space Commission may be obtained. The financial limit may be reviewed by the Commission annually.
21. To enable ANTRIX to discharge its full responsibility to evolve as a real corporation, a critical minimum staff from ISRO/DoS should be deputed. Specialists can be engaged by ANTRIX on contract terms additionally. Remuneration package can be given at market rates to attract talent.
22. ANTRIX has so far not itself undertaken vendor development activities which are being done by ISRO centres. This was an important

component of its mandate. Similarly, Joint Ventures with private sector are necessary for outsourcing the products and services required by DoS/ISRO centres. It can also manage certain Government corporations on behalf of ISRO.

23. There is a need for regular peer review of ISRO every three years to assess ISRO's administrative and scientific cultural practices. These should be checked and strengthened. Such a cultural audit is useful and will bring out inadequacies in existing policies and strengthen governance systems.

CHAPTER – 1

DEPARTMENT OF SPACE, SPACE COMMISSION & ANTRIX

1. Introduction

1.1 The Indian Space programme is today widely seen, in the country and elsewhere, as a model for the successful development of technology in the country and its utilization in a variety of fields for achieving societal goals (such as education, health, natural resources survey, crop monitoring). Over the last four decades, ISRO has many successes to its credit: a very reliable Polar Satellite Launch vehicle (PSLV), and a long series of remote sensing satellites producing detailed data of interest to agriculture, rural and urban planning, industry, disaster management etc. It has to-date launched a total of 36 satellites for customers within India and 25 satellites for those outside. The remarkable achievements of the Indian Space programme have been duly noted by the foreign technical press as well; for example, the US magazine Aviation Week and Space Technology has at various times hailed ISRO's "*success on a shoestring budget*" and its "*prolific space programme*".

1.2 In addition, ISRO has been seen as setting national bench marks for skills in project management, openness to the public, transparency in its knowledge transactions and, in general, for the development of a unique ISRO culture among its employees. The country's achievements in space have been admired by people from all walks of life – from political leaders and Parliamentary Committees to the man in the street. It is therefore in our national interest to maintain the strengths of the Indian Space programme.

1.3 The Department of Space (DoS) and Space Commission were set up after an approval of the Cabinet in May, 1972. Space science and technology was at that time developing rapidly and it was felt that the exploration and utilization of space from the upper regions of the earth's atmosphere using balloons and sounding rockets, and outer space by

satellites and deep space probes, was feasible. India had till then conducted experiments using only balloons and sounding rockets. Satellites were then generally being used for communications, weather services, survey of earth's resources, ecology, Defence, navigation, geodesy, as well as other scientific experiments relating to earth science. It was also felt that the use of satellite technology, which was developing as a powerful tool to radically transform the scene with regard to communications and potentially powerful audio-visual medium developing in the areas of education, agriculture, weather services, healthcare and family planning was important.

1.4 The Space Science and Technology programme had earlier developed under the aegis of the Atomic Energy Commission and the Department of Atomic Energy. Various space-related projects were being carried out then within a comprehensive organization referred to as the Indian Space Research Organization (ISRO). ISRO was an autonomous body wholly financed by the Government of India through the Physical Research Laboratory, Ahmedabad, which was one of the aided institutions supported by DAE. In view of the expansion of the activities of the Atomic Energy Commission and the need for development of space activities which had been growing, it was decided to set up a Department of Space and a Space Commission on the pattern of the Atomic Energy Commission (1972). An assessment¹ of the Space programme made at that time indicated the following picture:

"The Indian Space Science and Technology programmes have been developed under the aegis of the Atomic Energy Commission and the Department of Atomic Energy. Early work involved balloon launchings from several locations in India, notably Hyderabad, as also satellite tracking from Nainital. In November, 1963, the first sounding rocket firings were conducted close to the geomagnetic equator from the Thumba Equatorial Rocket Launching Station (TERLS) near Trivandrum. Since then, many centres and activities have developed; Rocket firings from TERLS, which is an international rocket launching facility under U.N. auspices, have been carried out

¹ Extracts from the Note for Cabinet prepared to consider setting up Department of Space and Space Commission.

by several nations; collaboration programmes have been carried out by India with USSR, USA, UK, France, West Germany and Japan. Major assistance has been received from USSR, USA and France. In the area of space technology, the Space Science and Technology Centre (SSTC) has been developed at Veli, adjacent to Thumba. In the same area, there is a Rocket Fabrication Facility (RFF) and a Rocket Propellant Plant (RPP). A Propellant Fuel Complex (PFC) is to be put up. Over 30,000 acres of land have been acquired at Sriharikota (SHAR), in the Nellore District of Andhra Pradesh, on the east coast of India just north of Madras. This is primarily to be used as a proving range for testing out large rocket systems under development, as well as for launching satellites; for satellite launching the east coast location has technological advantages. A number of major test facilities and production plants are planned to be set up at SHAR. Additionally, it is proposed that SHAR will be a national facility which can also be made use of by the Defence Agencies in the country. Another major area is of Space applications. In this, two significant experiments are the Satellite Instructional Television Experiment (SITE) and the programme for analyzing pictures taken by the Earth Resources Technological Satellite (ERTS) for evaluation of the earth's resources. SITE is to be in operation by 1975 and the ERTS analysis from mid-1972."

1.5 The Space Commission was set up, in the above context, to promote rapid development of activities connected with space science, space technology and space applications and to have responsibility in the entire field of science and technology of outer space and their applications. The main functions of the Space Commission, of which Secretary, DoS was to be the Chairman, were:

- "(a) For formulating the policy of the DoS for the consideration and approval of the Prime Minister.*
- (b) For preparing the budget of the DoS for each financial year and getting it approved by Government, and*
- (c) For the implementation of Government's policy in all matters concerning outer Space."*

1.5.1 While framing the rules of business of the Commission, the notified business mentioned that cases of the following nature would be brought before the Commission:

- “(i) Important matters of policy relating to Space Science, Space Technology and Space Applications.*
- (ii) Proposals for legislation or promulgation of rules and orders in the exercise of statutory powers conferred on the Department.*
- (iii) Budget proposals.*
- (iv) All proposals for capital expenditure exceeding Rs.1 crore.*
- (v) Proposals concerning the conditions of service of personnel of the Department, involving major departures from normal Government rules.*
- (vi) Proposals for the acceptance of any rules and procedures which involve significant deviations from the normal rules and procedures of Government.*
- (vii) Any other case which, with the approval of the Chairman, may be placed before the Commission.”*

1.5.2 The Chairman was given the power to add to this list such other matters as in his opinion require consideration by the Commission.

1.6 It was also approved that the Commission shall have powers of the Government of India, both administrative and financial, for carrying out the work of DoS within the limits of the Budget provisions approved by Parliament. It was also given the power to frame its own rules and procedures.

1.7 The Commission was, thus, set up to develop matters relating to Space and given full powers of the Government, both administrative and financial, within the budget passed by Parliament. This was considered necessary to ensure rapid development of Space technology as we were still in the initial stages of development. The Commission, though it had powers to consider implementation of the Government of India policy in all matters connected with Space, only major policy issues were expected to be brought before the Commission. Wide ranging powers were given to

the Chairman, who was also Secretary of DoS, to place matters before the Commission.

1.8 Rapid developments took place in the Indian Space programme with launching of INSAT-1 (1982-83). The Space programme started moving from a developmental and semi-operational phase to the fully operational phase. Several services which were new at that time were coming up. This included rural telephony, business communication, search and rescue operations, navigation, mobile communication etc. In the area of remote sensing, there was a need for progressive upgrading of earlier systems for better management of country's natural resources. An increase of several-fold in space activities was expected in the Eighth Plan (1992-97). It was necessary to plan for a four-fold increase in the payload capacities in the 1990s to meet the requirements of telecommunications and to expand in other sectors. The Indian Space programme was developing capabilities in building world-class satellites for communication and remote sensing, and in launching remote sensing satellites with indigenously developed launch vehicles (PSLV/GSLV). INSAT-2A and INSAT-2B were launched in July, 1992 and 1993 respectively. Subsequently, in December, 1995 INSAT-2C was launched. For remote sensing applications, IRS-P2 and IRS-P3 were launched in 1994 and 1996 respectively and IRS-C was launched in December, 1995.

1.9 In realizing its goal for development of the Space programme, DoS/ISRO had pursued a conscious policy of building up and nurturing industrial capabilities in the country to support their programme both through technology transfer from ISRO to industry and through utilization by ISRO of the technology and infrastructure capabilities of the domestic industry. The utilization of Indian industries' capabilities and potential of the Space programme was growing over successive Plan periods. The technology transfer and industry coordination process evolved over the years had helped development of indigenous availability of Space materials, components and systems. In view of the rapid expansion of the programme, Indian industry was now expected to make a progressively increasing contribution to the Space programme. This was expected to be

several times larger with increasingly complex technologies being used. As against Rs.800 crore of industry contribution during the Seventh Plan, the contribution of industry thereafter was expected to go up nearly three-fold with greater sophistication in the nature of the items contributed. It was realized that not to develop industrial capability will result in serious setbacks in the Space programme. In its absence, organizations like ISRO who were engaged in hi-tech R&D would have to take up regular manufacturing, which they may not be well equipped to handle. It would result in high costs and large addition of in-house manpower. This was also against the broad objective of ISRO to bring down the proportion of manpower costs from the current level of about 14% to 6% by 2000 by greater involvement of industry in its projects.

1.10 The function of technology transfer and industry coordination in the earlier phases of the Space programme was performed by a relatively small group of techno-managerial personnel within ISRO/DoS. With the increasing complexity of ISRO projects, a new organizational structure was necessary. Space-related manufacturing activities, it was assessed, were fundamentally different from other sectors in a number of areas. These special features required a close and continuing interaction between technical and user groups in ISRO, DoS and the industry. These special features² were identified as follows:

- “(i) These activities involve very advanced areas of technology. These are unfamiliar to most industries, (e.g., maraging steel fabrication) which, therefore, require to be closely guided, assisted and supported by the technical groups of ISRO/DOS, which will in turn interface with other R&D Laboratories wherever necessary.*
- (ii) Most of the technologies are sensitive, closely held and banned for exports by developed countries. Technological know-how in these areas is mostly not in the public domain. Technologies have to be developed initially by ISRO or by industry, in close and continuing interaction with ISRO's R&D units. Subsequent productionisation of these technologies also involves considerable developmental efforts in scaling up from lab-level/pilot-level. Moreover, technology*

² Extracts from the Cabinet Note prepared by Department of Space for setting up of ANTRIX.

transfer/productionisation is not a one-time process, as the technologies undergo continuous improvement and upgradation based on feedback by the user groups both in ISRO/DOS and outside.

- (iii) Technologies in space related areas are rapidly changing with higher capabilities and greater economies being a driving goal. This dynamic environment again requires a close interaction between ISRO/DOS and industry.*
- (iv) Reliability and quality assurance form an extremely demanding requirement in space related items, which call for an extended process of training and inculcation of the reliability and quality culture of space programmes, through interaction with ISRO scientists/engineers.*
- (v) On account of rising global demand, there is a great potential for export of spacecraft, launch vehicle and ground-based systems. Due to the high reliability requirements for space-related items, Indian industry will not, on its own, be in a position to enter the space export market without the strong backing and continued association of a premier, internationally known space research organisation, like ISRO."*

1.11 It was also assessed that multi-disciplinary personnel were required for meeting these requirements since the tasks involved in the industry coordination were of such multifarious dimensions. Close interaction not only with the entrepreneurs and industrialists but also financial institutions, market research, legal experts, government agencies and other R&D institutions was considered necessary for effectively discharging this interface responsibility. It was also necessary that the organic links with the R&D groups and projects within the ISRO/DoS are maintained. On account of the multi-disciplinary and variegated nature of functions, ISRO/DoS was not suited to support such a role without detriment to its primary R&D responsibility. A purely departmental group functioning within ISRO and without distinct identity role would also have been unsuited for instance in market performance as well as export promotion. A departmental set up would also lack the required flexibility in discharging administrative and financial functions.

1.12 Against this background, it was considered necessary to dedicate a whole-time group functioning as a distinct corporate entity to fulfil this role. There were several other features which it was necessary to keep in mind, while considering this new organization. It was not expected to undertake production or manufacturing activities directly. The aim was to promote such activities through entrepreneurs and vendor identification, promotion of joint ventures, joint sector enterprises and intrapreneurship (organizing ISRO employees to set up enterprises in high technology areas, where this is of advantage to the Space programmes). In view of rapidly changing technologies as well as different areas of technology wherein industry promotion/technology transfer may be required, such an organization would have to keep its techno-managerial strengths finely tuned to the changing needs with time. It would not have a permanently recruited body of executives but adopt a policy of inducting from time to time, from ISRO as well as from other sources, specialists with the requisite techno-managerial background on a short-term basis. The intention was that personnel from ISRO may be taken on deputation for a limited period and from industry or academic research or financial institutions on specific contractual terms. The company was expected to be lean, closely knit and have techno-managerial and functional specialists not numbering more than about 20 in the early stages.

1.13 The Corporate Front of DoS was expected to be tailored to suit the following functional requirements:

- (a) Technology Transfer
- (b) Contracts for utilization of industries' own technological strengths for the Space programme (technology utilization)
- (c) Support for capital funding in specialized production operations connected with ISRO's programme
- (d) Investment in share and loan capital of companies promoted for taking up production for Space
- (e) Venture capital funding.

1.13.1 A detailed Memorandum of Understanding (MoU) between the Corporate Front and the Department of Space to meet the above requirements was to be evolved in consultation with the Ministry of Finance and the Department of Industry. The proposal was finally approved by the Cabinet with the following directions:

- “(i) Authorizing the Department of Space to incorporate under Section 12 of the Indian Companies Act, a Company wholly owned by the Central Government to take over the Space – Industry interface activities, from the date of incorporation and with an authorized share capital of Rs.10 crores in initial phase;*
- (ii) Authorizing the Department of Space, wherever necessary, to take all actions incidental or consequential to the above;*
- (iii) Approving the following arrangements:*
 - Non-applicability of Bureau of Public Enterprises (BPE) guidelines, subject to the Space Commission evolving suitable guidelines while taking note of BPE guidelines;*
 - Selection and appointment of Board level functionaries including the Chairman, by Space Commission/Department of Space, instead of by Public Enterprises Selection Board.”*

1.14 In pursuance of the above decisions, ANTRIX was set up as a company under the Companies Act, 1956 on 28th September, 1992. It had an authorized share capital of Rs.5 crore. It was a private limited company whose shares were entirely held by the Government of India.

CHAPTER – 2

EVOLUTION OF SATCOM POLICY

2.1 The setting up of the Space Commission in 1972 was followed by other measures to strengthen the management of the Indian National Satellite (INSAT) system. After discussion in September, 1977 in the Committee of Secretaries (CoS), it was decided to set up an inter-Ministerial or INSAT Coordination Committee (ICC) for coordination and monitoring the implementation of the INSAT-1 system and for planning its future development (Annexure-I). The ICC³ was chaired by Secretary, Department of Space and had the following composition:

- | | | |
|--|---|----------|
| (i) Secretary, Department of Space | - | Chairman |
| (ii) Secretary, Department of Economic Affairs,
Ministry of Finance | - | Member |
| (iii) Secretary, Ministry of Communications | - | Member |
| (iv) Secretary, Ministry of Tourism and Civil Aviation | - | Member |
| (v) Secretary, Ministry of Information & Broadcasting | - | Member |

2.2 Apart from coordination and monitoring the implementation of INSAT-1 system (both Space and Ground segments) to ensure efficient and timely execution, it was specifically tasked for planning future developments and consideration of problems relating to orbit-frequency coordination of the INSAT system.

2.3 The Coordination Committee had also decided to set up a Technical Advisory Group (TAG) to consider and advise on all technical matters influencing more than one component of the system that may be referred to it by the Coordination Committee. It was to be serviced by a special Unit located in the Department of Space. In the meeting of the ICC held on

³ In recent past (2004-05), after changes in some Ministries, the actual composition is Secretary, DoS as Chairman and Secretaries of Ministries of Communications, Information Technology, I&B, Finance and S&T and Member (Finance), DoS as Members. It also consists of Additional Secretary, Cabinet Secretariat, Joint Secretary, PMO, Wireless Adviser, WPC/MoC and Director SCPO from ICC Sectt./DoS as Standing Invitees.

23rd January, 1978, the INSAT Programme Director was indicated as the Secretary of the Committee. The meeting also decided that the Wireless Adviser to the Government of India in the Ministry of Communications would be Special Invitee to the meetings of the Committee whenever orbit-frequency matters or matters having implications on the subject come up for consideration of this Committee. We understand this practice has been continuing since then.

2.4 The rules of business for the ICC/TAG were also finalized in this meeting. It was decided that cases of following nature may be brought before the Committee:

- "(i) Important matters of policy relating to the INSAT system, both Space and Ground-Segments.*
- (ii) Establishment of specifications, plans and schedules which impact more than one component of the INSAT-I system.*
- (iii) Adoption of procedures for verification and monitoring of performance characteristics of earth stations having access, and for coordination of access, to the INSAT Space-Segment.*
- (iv) Approval of new types of earth stations/terminals for access to the space-segment.*
- (v) Important orbit/frequency coordination matters, particularly those influencing more than one component of the INSAT System and/or the capabilities and cost-effectiveness of the space-segment and its utilization.*
- (vi) Utilization plans.*
- (vii) Proposals for enhancement of or reduction from the Cabinet approved INSAT-I System, and proposals for future systems, i.e. for second generation and beyond."*

2.5 Earlier it had been decided that TAG was to include representatives of the Departments which were represented in the ICC. In addition, the Wireless Adviser to the Government of India was also now co-opted as a Member. The ICC meeting further directed that Programme Director, INSAT and Secretary to ICC may serve as Member-Secretary and Convenor of TAG. TAG was also authorized to co-opt any technical specialist from a

participatory Ministry/Department for detailed technical examination of issues referred to it.

2.6 The rapid expansion of the Indian satellite network for broadcasting and remote sensing gradually led to a need for a policy framework for satellite based communication systems by private parties. Technological developments in the field of broadcasting and communications were creating rapidly expanding requirements for these services. On the telecommunication side, Indian parties had been allowed to provide value added services like VSAT using INSAT. Several close user networks were operational using INSAT. Private parties were being promoted to provide smaller and budgeted services throughout India. For broadcasting services, several Indian parties were using foreign satellites as there was no restriction on either directly receiving their broadcasting signals or re-distributing them by cable.

2.7 In the 1990s, it was estimated that the outflow of foreign exchange, which was an important component in decision making, was US\$ 15-20 million per annum due to the use of foreign satellites. This was expected to increase in the following years. It was argued, in view of this position, that the policy of not allowing Indian private parties to use capacities from INSAT to provide TV services, was only benefitting foreign satellites. These service providers were using foreign satellites to lease capacity. It was felt that this was stifling the growth of the INSAT system. The INSAT system, like the TV transmitter or microwave tower funded by Government of India, was then a captive facility of the Government. It was only fair that Indian private enterprise was given access to the infrastructure created by the Government. Since the satellite system was capital-intensive the preference of private operators could be to lease transponder capacity from foreign satellite operators. The private operators could, hence, also be allowed to establish their own systems.

2.8 On questions of uplinking from India or abroad, several issues emerged⁴:

- “(i) The policy on broadcasting from space cannot be delinked from the policy on terrestrial broadcasting.*
- (ii) Most of the countries do not permit operations with foreign satellites. In many countries even direct reception from satellites using dish antenna is not allowed.*
- (iii) Satellites are normally controlled from the countries in which they are registered. In fact, most countries have regulations which make it necessary that the control stations of the satellites registered through their Administrations is located in their territory. Satellite broadcasting of TV signals including DTH will emerge as an interactive two-way information system and, hence, it will not be in the long-term interests of India to depend on or even allow a major part of Indian information infrastructure to be handled by foreign satellites registered in foreign countries and under their operational control.”*

2.9 In view of the above concerns, it was clearly not advisable to permit operations with foreign satellites from Indian soil. It was important that all uplinking for broadcasting be taken through INSAT systems or from Indian soil with suitable regulatory mechanisms in place. To ensure effective satellite service, exceptions could be made on a case by case basis for Government agencies or, in the event of any capacity leased by the INSAT system to augment or replace its own capacity. It could also be necessary in the case of overseas services using international inter-governmental systems or systems owned and operated by Indian parties but registered in other countries before rules for registration were formulated in India, or international private systems where there is a substantial Indian participation by way of equity or contribution in kind. There could be provisions in policy for reciprocal arrangements to be worked out with the country/countries of registration or ownership. Operation with INSAT, thus, could be permitted without much restriction.

⁴ Extracts from the Cabinet Note dated 15th May, 1997 on “Satellite Communications in India – A Policy Framework”.

2.10 Apart from permitting broadcasting through transponders leased from INSAT or provided by DoS through foreign satellites, it was also considered necessary to permit, in exceptional cases, an alternative mechanism for Indian private parties operating commercial satellite systems. The INSAT system was expanding at that time, but could not be expected to expand forever. It was, therefore, necessary to develop a concept of "Indian Satellite". This was expected to be owned by an Indian party and notified and registered through the Indian administration. The Wireless Planning and Coordination Wing (WPC) of the Department of Telecommunications (DoT) could be given the responsibility for notifying the systems to the International Telecommunications Union (ITU) on behalf of the Indian administration.

2.10.1 The definition of Indian party in each sector, such as Telecommunication or Broadcasting, was expected to follow the definition adopted for this purpose in that particular sector. Alternatively, a single definition for the Space system could be developed. The conditions for notifying, coordinating and registering private satellite parties were expected to include economic and efficient use of the orbit spectrum, willingness of the party to use products available in India (satellite launch vehicle, ground systems etc), and an assessment of the requirement for the system, particularly if it was meant essentially to cover India. It was noted that these restrictive clauses may be included because of the fact that orbit-spectrum was a limited natural resource and needed to be used judiciously.

2.11 The need for a new policy was also highlighted at that time by International Telecommunications Union (ITU) regulation prevalent then providing for space satellites being permitted on first-come-first-served basis without any respect for national boundaries. The orbit-spectrum was clearly a valuable resource. The US had notified several orbital slots over the Indian Ocean region in the Ka-band and had allotted the slots to individual American companies. It had auctioned a satellite slot with orbit-spectrum (1996) for US\$ 685 million at that point of time. Luxembourg

had also done a similar thing. The US had also filed for a Ku-band allocation to cover India at 101° orbital slot for which India had also filed an application. The UK had filed for three orbital slots in the name of a USA-based company. Thus, the importance of the orbital slot system in the context of international trade or information infrastructure could not be taken lightly. Several countries had started trading in orbit-spectrum resources. The US had adopted an aggressive policy of acquiring orbit-spectrum resources. The ITU policy was benefitting a number of countries and we needed to move more aggressively in this direction.

2.12 After an extensive consultative process, the broad policy framework for regulating satellite communications in India was placed before the Cabinet, which approved the note on 24th June, 1997. An Inter-Departmental Committee of officials drawn from DoS, DoT and Ministry of Information & Broadcasting and other concerned Ministries/Departments was now asked to draft the detailed norms, guidelines and procedures concerning various aspects of the policy and submit a document for consideration of the Cabinet. A set of norms/guidelines were prepared on this basis and were considered and approved by the Cabinet in a meeting held on 12th January, 2000. A copy of these "Norms, Guidelines and Procedures for Implementation of the Policy Framework for Satellite Communication in India" as placed before the Cabinet in the above meeting are placed at Annexure-II. The Cabinet approved these with the modification that *"in the case of use of foreign satellites for the international gateways of ISPs, instead of the norms and guidelines indicated in paragraph 4.5.3 and 4.5.5 of Annexure-I of the note, the mechanism already established by the Telecom Commission in consultation with the Department of Space would operate."*

2.13 Two crucial features of the guidelines were

- (i) Authorizing INSAT capacity to be leased to non-government (Indian and foreign) parties following certain well defined norms.
- (ii) Allowing Indian satellites to provide services, including TV uplinking through Indian Satellites, subject to certain terms and conditions.

2.13.1 Further, the principles guiding the use of capacity by private players envisaged that:

- (i) The INSAT capacity available to the Commercial sector should be based on sound business lines, i.e. this activity should be on a 'for profit' basis, and at the same time be consistent with Government policies in the concerned user sectors.
- (ii) All policies regarding the INSAT system shall be determined by the INSAT Co-ordination Committee, keeping in view the Cabinet-approved Policy Framework for Satellite Communications in India.

2.13.2 It was proposed that a classification of user sectors, including Telecommunications, Broadcasting, Education, developmental communications, and Security communications for Defence Ministry/ Services, could be undertaken. Additional capacity was to be created for non-governmental parties at their request, based on commercial considerations and, if technically feasible, without adversely affecting the capacity already projected, accepted and funded by or for government needs.

2.14 In respect of allocation of capacity to Departments/users, the following were some important policy provisions:

- "(i) As far as allocations to Department of Telecommunications, Doordarshan and All India Radio for their direct use on the existing and planned capacity on INSAT satellites are concerned, the existing practice shall continue. Planned capacity means the capacity projected by these agencies on a long-term basis and included in the configuration of a particular satellite or series of satellite.*
- (ii) ICC shall earmark at least a certain percentage of capacity for use by the non-governmental users who have been authorized by law to provide various telecommunications services, including broadcasting.*
- (iii) With reference to the other users ICC may evolve the procedures from time to time taking into account the capacity available and the prevailing situation in the satellite communications market.*

- (iv) *Insofar as broadcasting is concerned any use of INSAT capacity for serving India will be tailored to meet the provisions of the Broadcast Bill that may be enacted.*
- (v) *Insofar as telecommunications is concerned any use of INSAT capacity for users in India will be based on the existing provisions/arrangements. ICC may review this arrangement at any time as required.*
- (vi) *The responsibility for obtaining the necessary licenses to offer a service in a particular territory (in India or in other countries) shall be that of the Party which has taken the capacity on lease.*
- (vii) *Operations with INSAT and providing the services in India will be subject to the Party obtaining the requisite operating and frequency/siting license from the concerned authorities.*
- (viii) *Insofar as capacity allocation for (a) Education and Development Communications and (b) Security Communications for Defence Ministry/Services is concerned, the existing practice of transponder allocations by ICC shall continue."*

2.14.1 ICC thus emerged as a key institution for earmarking usage of INSAT capacity by non-government users.

2.15 The broad framework of the above regulations, thus, stipulated permitting INSAT capacity for private use. This was to be done on a 'for profit' basis, consistent with the Government policies in the concerned sectors. All policies regarding these were to be finalized by the INSAT Coordination Committee, keeping in view the Cabinet approved Policy Framework. In respect of Telecommunications, it was, however, specifically mentioned that any use of INSAT capacity by users in India would be based on existing provisions/arrangements. ICC could review the arrangement at any time as required.

2.16 The Policy Framework approved for Satellite Communications in 1997, and the Guidelines approved subsequently by the Cabinet on 12th January, 2000, were followed up by some effective steps to operationalize these. A Standing Committee chaired by Additional Secretary/IFA was

formed during June, 2002 to review the marketing strategy for INSAT transponder capacity and to establish minimum price for INSAT transponders for commercial users (Annexure-III). This was followed up by demand for transponder capacity by private players for broadcast satellite services/mobile satellite services (VSAT) and subsequently by DTH operators. Around 2004, the demand for Direct-To-Home (DTH) Broadcasting had started growing. Many operators including Tata Sky and Sun TV had shown interest in leasing high power Ku band transponders for DTH services with growth potential from the same orbital location. Accordingly, the INSAT-4 series of satellites were predominantly designed to meet the DTH service requirements.

2.17 To meet the immediate requirement of Doordarshan and for the DTH project, DoS augmented its capacity through leased capacity from New Skies Satellite (NSS) of Netherlands during May, 2004. These transponders were leased as part of INSAT capacity and made available to DD and others through contractual arrangements, with the understanding that the customers would migrate back to an INSAT platform once sufficiently high power Ku-band capacity was available in INSAT 4A/4B or 4C. Tata Sky, one among the early bidders, was allocated bandwidth of 12 Ku transponders on INSAT-4A, which was to be launched on 22nd December, 2005. Details of satellites launched during 2000-2007 in the INSAT-3 series, viz. 3A, 3B, 3C, 3D and 3E, and in the INSAT 4 series, viz. 4A, 4B and 4C, are enclosed at Annexure-IV.

2.18 During 2005-07, the demand for Ku-band capacity expanded with private operators such as Sun Networks, Reliance, Bharti Airtel, Bharat Business Channel Limited (Videocon) etc. also seeking immediate bulk capacity for respective DTH services. Therefore, it became necessary to explore the opportunities for leasing transponders from foreign satellites serving over India. Due to the non-availability of immediate Ku-band capacity from an INSAT platform, the requirement from Reliance for Ku-bandwidth was met through leased capacity of 8 transponders from Measat, a satellite operator based in Malaysia. Further, the requirement of capacity from Bharti Airtel for DTH services was provided through lease

of 6 transponders on INSAT 4CR, launched during February, 2007. Videocon, the last DTH operator with requirement of Ku-band capacity, was leased capacity of 9x36 MHz transponders on ST1 (operated by Singapore Telecom, based in Singapore). The following Table provides an overview of the capacity leased through other operators:

Augmented INSAT capacity leased through Foreign Satellites

Year	Satellite	Country	Services	C-band	Ku-band (Transponders)
2001	NSS-11	Netherlands	VSAT		7
2004	NSS-6	Netherlands	DTH		11
2006	NSS-6 Intelsat	Netherlands, U.K.	DTH VSAT		1.5
2007	Intersputnik	Russia	VSAT		3
2008	MEASAT 3 NSS-6 NSS-11	Malaysia, Netherlands	DTH		11.5
2009	SingTel MEASAT 3 MEASAT 3A	Singapore, Malaysia		7	10
2010	Measat 3 NSS-12 SES-7 Asiasat	Malaysia, Netherlands, Hongkong	DTH and DSNG		29
2011	IPSTAR (717.62 MHz)				
Total Transponders					80

2.18.1 Thus, during 2001-11 rapid expansion took place in use of INSAT capacity by non-government parties and leasing of transponders from foreign satellites. As on today, DoS has leased 126 Transponders from the INSAT system on commercial basis and ANTRIX has leased 80 Transponders from Foreign Satellites. ??

2.19 The charges for the services to non-government users and the conditions for these (fixed in pursuance of the guidelines by Ministry of I&B and DoT) are briefly mentioned in the Table given below. These were

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in addition to transponder leasing charges, which were Rs.4-4.5 crore/ transponder for DTH/TV services.

Type of Charge	DTH	TV Uplink	VSAT (Commercial)	VSAT (Captive)
Entry Fee	Rs.10 crore (Non-refundable)	Rs.5 lakhs/ Teleport, Rs.5 lakhs/ TV Channel	Rs.30 lakhs (Non-refundable)	Rs.30 lakhs
Service License Fee	10% of AGR		6% of AGR	Rs.10,000/VSAT/ annum
Licensing Period Validity	10	10	20	20
Bank Guarantee	Rs.40 crore		Performance BG: Rs.50 lakhs for one year <u>Financial BG:</u> Rs.30 lakhs for one year	<u>Financial BG:</u> Rs.30 lakhs for one year
NOCC Charges	Rs.21 lakhs/ 36 MHz	Rs.21 lakhs/ 36 MHz	Rs.21 lakhs/ 36 MHz	Rs.21 lakhs/ 36 MHz
<u>Spectrum Charges:</u>				
Spectrum Royalty Charges (based on the bandwidth used)	Rs.35,000/year/ MHz or part thereof	Rs.35,000/year/ MHz or part thereof	On revenue sharing basis: 3% to 4% of AGR based on date rates	Rs.20,000/hub Rs.5,000/VSAT
Spectrum License Fee (charge for the transmit equipment)	Rs.1,000-2,000/ annum/Tx equipment	Rs.1,000-2,000/ annum/Tx equipment	Rs.1,000-2,000/ annum/Tx equipment	Rs.1,000-2,000/ annum/Tx equipment
Validity of WPC Operational License	One year (further renewal subject to payment of Royalty/License Fee)	One year (renewal subject to yearly payment of spectrum fee)	Five years (subject to yearly payment of spectrum fee and renewal)	One year (further renewal subject to payment of Royalty/License Fee)

CHAPTER – 3

REVIEW OF AGREEMENT BETWEEN ANTRIX & M/S DEVAS MULTIMEDIA PVT. LTD.

3.1 Background

3.1.1 As part of the process mentioned earlier in Chapter-2 and to develop further technical collaborations, a delegation led by the then Chairman, ISRO, Dr. K. Kasturirangan had visited US in July/August, 2003. Prior to it, Forge Advisors (FA-USA), a consulting firm, had visited India and made Presentations to ISRO on their capabilities in March/May, 2003. This was a consulting firm and had good professionals of Indian origin. During the visit to Washington, D.C. discussions took place with FA-USA and a MoU was signed between ANTRIX and FA-USA (copy of the MoU is placed at Annexure-V). It was mentioned therein that this was only a MoU and non-binding and did not constitute any agreement, and it only set forth the intent of the parties to cooperate. The MoU also mentioned that based on mutual consent, tactical projects will be undertaken by FA-USA on sales, marketing, business development and strategic partnership negotiations. It also included certain other areas like launch of new application services, strategic partnership negotiations, business case development for new services, market opportunity assessments etc. Nothing was mentioned about multimedia services in specific terms. It was also mentioned that FA-USA considers its capability and substantial experience in the satellite, telecommunications, media and particularly technology industries as assets. While no specific agreement on multimedia mobile services was mentioned, the MoU envisaged possibility of cooperation in very extensive fields.

3.1.2 Subsequent to the above MoU, discussions were held between FA-USA and ISRO. They, then, submitted a proposal (April, 2004) in which ISRO was to invest in the space segment and FA-USA in the ground segment for forming a strategic partnership for launching a satellite based national service. This was followed with a Presentation to Chairman,

ANTRIX/ISRO and senior officers of ANTRIX/ISRO/DoS in May, 2004. FA-USA proposed that ISRO/FA-USA could set up a Joint Venture, which would deliver video, multimedia and information services via satellite to mobile receivers in vehicles and mobile phones across the country. The service was named 'Devas'. The proposal involved setting up by ANTRIX/ISRO of a high powered multi-beam satellite that is capable of delivering signals to mobile receivers fitted in cars/vehicles as well as mobile phones. The receiver technology was to be provided by FA-USA. It was projected by them that Devas would be creating a state-of-the-art communication infrastructure across India with this proposal that had more functionality and demands, and less investments than alternate technologies of 3G. To consider this Joint Venture proposal, a Committee was appointed in May, 2004 under Dr. K.N. Shankara, Director, Space Application Centre (SAC), Ahmedabad.

3.1.3 The Shankara Committee was asked to examine the proposal in greater detail in all dimensions, including the following:

- "(i) Technical feasibility, aspects relating to implementation.*
- (ii) Provisions related to risk management, including possibilities of alternate uses for space segment.*
- (iii) Financial and market aspects and feasibility.*
- (iv) Time schedule/organizations aspects."*

3.1.3.1 It was expected to have detailed discussions with FA-USA, with a view to determine its technology and viability. FA-USA had several detailed discussions with the Committee.

3.1.4 Even as the issue was under examination by the Committee and its recommendations were awaited, the ANTRIX Board unanimously accorded an 'in principle' approval on 11th June, 2004 in its 54th Board Meeting for taking further steps towards processing the Joint Venture proposal with Devas, which would take into account the final recommendations of the High Level Committee and also look into further steps with the approval of Chairman, ISRO. In October, 2004, a Presentation was made to Chairman, ISRO, Director, ISAC and Executive Director, ANTRIX at Vancouver on an

update of the progress of Devas. In the meanwhile, the Committee under Dr. Shankara was working to finalize its recommendations for a definite agreement.

3.1.4.1 The Shankara Committee looked at a range of questions dealing with technology, risk management, use of frequency and the financial terms offered by Devas (a copy placed at Annexure-VI). They also looked at the option of the Joint Venture proposal. In several of these areas, they made good recommendations which reduced the risk for ANTRIX/ISRO. These included the recommendation to move from Joint Venture pattern to leasing of transponder. The technology and the patents and copyrights for technology were not very clear at that point of time and it was only appropriate that ISRO confines itself to leasing of transponders rather than getting involved in a full-fledged Joint Venture. In respect of Space segment they suggested use of optimization of spot beam coverage to enable better usage of frequency. In respect of several other items like satellite failure criteria, where the original proposal for a failure to be defined as a one beam failure was improved to two beam failure. They also looked into respective roles of ANTRIX and Devas and recommended that Devas was to procure licenses and approvals required for operating their services on the consumer end, thereby insulating ISRO from these issues. In financial terms also the original suggestion for \$5 million upfront was improved to \$20 million upfront and the annual fee for the lease period from \$9 million to \$11.25 million when Devas became cash positive. These were certain positive features which they were able to negotiate. In respect of certain other areas, as mentioned subsequently there were gaps. One of them was the use of availability of frequency and possible alternative uses in the S-band.

3.1.4.2 On 24th December, 2004, the ANTRIX Board met and approved the draft agreement negotiated with Devas and recommended by Shankara Committee. The Board decided that pursuant to the 'in principle' approval granted by it earlier for having an agreement, instead of a Joint Venture the service could be supported by ANTRIX through leasing of capacity from S-band satellite being planned by ISRO as

recommended by Shankara Committee. It was noted that the FA-USA have also promoted the establishment of an Indian company called 'Devas Multimedia Pvt. Ltd, which would establish the service and lease the capacity for it. The Board also approved the draft contract which was reviewed and recommended by the Shankara Committee. It made certain suggestions on the technical annexures and decided that the agreement will be effective upon receipt of all necessary approvals, such as satellite project, orbit frequencies/locations etc. Additionally, the Board also perused the draft agreement for the lease of space segment on ANTRIX/ISRO S-band spacecraft by Devas and approved the same. These approvals were made under the items meant to consider 'Any other business with the permission of the Chair'. The agreement, based on above decision, was signed between ANTRIX and Devas on 28th January, 2005 (a copy placed at Annexure-VII).

3.1.5 The broad terms of the agreement envisaged ANTRIX to provide Devas on a lease basis, space segment capacity on Primary Satellite 1 (PS1) and an option to give additional capacity on Primary satellite 2 (PS2) to be manufactured for providing services in the S-band. It was also further agreed that 5 CxS transponders each of 8.1 MHz capacity and 5 SxC transponders each of 2.7 MHz capacity on the PS1 with technical performance and other specifications as agreed would be leased to them. The lease capacity would be on a 24-hour basis for a period of 12 years which was the life of the satellite. ANTRIX was expected to deliver the lease capacity from a fully operational PS1 satellite within 30 months (with a grace period of 6 months) from the date of first payment of the Upfront Capacity Reservation Fee (UCRF). This UCRF of \$20 million was to be paid in 3 equal instalments.

3.1.6 Payment for lease of transponders from PS1 included the above UCRF and a Lease Fee for leasing the transponders on each of the two satellites PS1 and PS2 and internal component acquisition fee as per the agreed terms. Apart from the upfront CRF being paid as mentioned above, the lease for PS1 transponders was fixed at \$9 million per annum payable quarterly. It was to be increased to \$ 11.5 per annum starting from the

quarter from which Devas was to become cash positive and continue till the end of the lease period. The Lease Fee did not include spectrum monitoring charges of NOCC on India which was to be borne by the Devas throughout the agreement.

3:1.7 It was also envisaged that if the delivery of the lease service is delayed from PS1 beyond the agreed schedule; i.e. 36 months, then a penalty of \$4,16,666 will apply to ANTRIX every month or part thereof of delay. If the delay were to exceed 12 months, ANTRIX was to be considered in material breach of the agreement. The penalty was then capped at \$5 million, which was equivalent to 12 months of delay.

3.1.8 The agreement also envisaged that ISRO would remain the registered owner of the orbit location on which the Leased Capacity is being made available to Devas. Devas was to ensure the use of the Leased Capacity strictly in accordance with the agreement. The agreement also specifically mentioned that ANTRIX shall be responsible for obtaining of necessary Government and regulatory approvals relating to orbital slot and frequency clearances and funding for the satellite. Specifically, Clause 25 of the agreement also envisaged that *"the contract would become effective on the date ANTRIX is in receipt of all required approvals and communicates to Devas in writing the same"*. It was not expected to be binding on Devas or ANTRIX *"until and unless ANTRIX receives all the requisite governmental and other regulatory approvals, including those referred to in this agreement"*.

3.1.9 On 26th May, 2005, a proposal was placed in the meeting of the Space Commission for approving design, manufacture and launch of GSAT-6/INSAT-4E and a budgetary support of Rs.269 crore, which did not provide for launch cost. The background note for the meeting mentioned that the approval was being sought for the state-of-the-art national satellite for Satellite Digital Multimedia Broadcasting (DMB) services capable of delivering mobile services and demonstration of mobile satellite applications to strategic users. The satellite mission was to advance the frontiers of technology through use of a large unfurlable

antenna using a 2 tonne GSAT bus. It was mentioned that in addition to the use of the satellite for multimedia services, the satellite capability can also be utilized for strategic and social applications.

3.1.10 While referring to the service utilization, it was mentioned that a significant portion of the capacity of the Spacecraft will be committed for lease to a service provider on appropriate commercial terms and further that DoS has already been approached by a service provider who had undertaken to lease the capacity over the life period of the satellite. Part of the capacity will also be utilized by ISRO for demonstration of satellite based mobile communication techniques and technologies. The new element in the Spacecraft, it was mentioned, was only the 5.5 metre unfurlable antenna. The Spacecraft was otherwise built around the proven I-2 K-series bus. There was no mention in the background note that agreement had already been signed with Devas, which envisaged earmarking 90% of the capacity for them.

3.1.11 A note for the Cabinet was sent on 17th November, 2005 for building up the satellite as earlier approved by the Space Commission. In respect of service utilization, it mentioned as follows:

"ISRO is already in receipt of several firm expressions of interest by service providers for utilization of this Satellite capacity on commercial terms. Part of the capacity will also be utilized by ISRO for experimentation and demonstration of new satellite based mobile communication techniques and technologies."

3.1.11.1 The proposal was approved by the Cabinet in December, 2005. On 2nd February, 2006, ANTRIX informed Devas of receipt of approvals on the satellite and frequency coordination. The contract, thus, became effective from that date.

3.1.12 It had been agreed under the agreement that Devas had the option which they could exercise for a second satellite by which they could ask ISRO to build a PS2. This option was exercised by them in June, 2007 and they paid an Upfront Capital Reservation Fee of Rs.29.19 crore for the

second satellite. A note to the Space Commission was placed for their approval (October, 2009). The Space Commission approved the proposal to proceed with fabrication of GSAT-6A at a cost of Rs.147 crore. This included neither insurance nor launch cost. It was, hence, below the financial ceiling of Rs.150 crore, above which Cabinet approval required. The service utilization was mentioned as follows in the note:

"The total capacity of the spacecraft will be committed for lease on appropriate commercial terms for providing digital multimedia and information services, including but not limited to audio and video content and information and interactive services across India that will be delivered via satellite and terrestrial systems using fixed, portable and mobile receivers, including mobile phones, mobile video/audio receivers for vehicles etc."

3.1.12.1 There was no mention of any agreement having been signed with any individual service provider. The proposal was approved by the Space Commission on 29th October, 2009.

3.1.13 Subsequent to the above, based on re-assessment, the matter was placed before the Space Commission in July, 2010 and, thereafter, considered by the Cabinet Committee on Security (CCS) in February, 2011. Based on it, a final decision has since then been taken to annul the agreement.

3.2 Technological Developments

3.2.1 The agreement between ANTRIX and Devas was signed in the context of the technological developments that had occurred by 2003-05. Multimedia mobile services were developing at that time, and were being introduced in Japan and South Korea.

3.2.2 The history of satellite-based digital technologies started with extensive digital audio broadcasting services during the 1990s. According to *Shim et al* (Journal of IT Theory and Applications, 2006). In May, 2005, Korea introduced the world's first cellular phone with the ability to receive satellite and terrestrial signals for digital multimedia broadcasting.

According to available information, there are now 4,98,000 customers (4,77,000 mobile phones and 21,000 cars) in Korea. The Japan/Korean satellite, MBSAT, is providing 12 TV, 25 Radio and 3 Data Channels for its customers. It is reported that a fee of \$13 per month was being charged to consumers for 7 video and 20 audio channels. The MBSAT system is operational with 8,000 gap-filler terrestrial components to provide necessary service quality. The MBSAT is positioned at 144° E, which is a Japanese orbital slot. It is operating in 2.5 GHz with 25 MHz band.

3.2.3 There have been several regulatory issues regarding these services in Korea. The Satellite Digital Media Broadcasting (S-DMB) services are not permitted to broadcast terrestrial TV programmes to earn revenue through charges to users. The terrestrial DMB (T-DMB) services earn their money from advertisements and are not allowed specific user charges. Both segments have been demanding changes in and relaxation of these regulatory restrictions.

3.2.4 In April, 2008, DBSD in the US launched a first-of-its kind next generation MSS satellite G1, operating in the 2010 – 2020 MHz and 2180 – 2190 GHz bands. This is located in orbital slot 92.2° W (FCC slot). It is using 20 MHz in 2.1 GHz band, and has been reported as conducting alpha trials. The satellite was extensively used during the Haiti earthquake.

3.2.5 There are two other satellite programmes of a similar kind. Briefly, these are Terrestar (Canada) on 111.1° W orbital slot with 2x10 MHz bandwidth in 2 GHz, providing MSS within US and Canada. The other is CMB Star, China, which was planned for use during the Beijing Olympics. However, the Chinese satellite could not be operationalized by the time of the Olympics.

3.2.6 In 2005, therefore, the technology of DMB systems was still evolving. Further, ISRO had to operate under technology control regimes imposed by US at the time. The likelihood of ISRO getting such technology from Japan appeared remote. Therefore, options open to ISRO were limited. Mobile satellite services had not been introduced in Europe. ISRO

was at that time seeking opportunities to develop or acquire innovative technologies, consistently with its policies and past experience in developing various space-related technologies in different areas. The challenge on the Indian side was the development of a 5–6 metre diameter unfurlable antenna and a high power bus. Previously, ISRO had only used deployable antenna of 2.2 metre radius. The larger antenna was required to give sufficient signal power to enable hand-held sets to receive good signals in the S-band. This was a technological development that ISRO was keen to undertake. Furthermore, ISRO was also looking for a service provider possessing technologies for hybrid digital communications.

3.2.7 At this time, a proposal was made by Forge Advisors, a US company that had well-qualified and experienced staff in the field of technology management. As mentioned earlier, several of them had worked in ISRO. Some had excellent management credentials, too, with experience at institutions like the Wharton Business School and McKinsey. Their offer of providing multimedia mobile services and an agreement on this count was apparently motivated by the fact that they would be able to bring both equity funds and technology to ANTRIX.

3.2.7.1 During the interaction with this Committee, Shri K.R. Sridhar Murthy, the then MD, ANTRIX emphasized to us the point that it was difficult to get technology from other sources and suggested that this was the major attraction of the FA-USA proposal. He also stated that the problem at that point of time was in chip design, with stringent dimensional requirements for use in compact hand-held devices. It was also necessary to ensure sufficient volume in manufacturing, so as to exploit economies of scale to reduce cost per chip and make MSS a profitable business venture.

3.2.8 The Committee appreciates the ISRO efforts to meet these challenges at a time when there were major developments in offering satellite-based digital multimedia services. The choice of FA-USA, however, is a grey area. While there were no technologies available from

other sources than FA-USA, there was a grey area in that it was not clear in what technologies FA-USA had access to full Intellectual Property Rights (IPR). There was nothing on record to evaluate the IPR situation with respect to the technologies being discussed. This would have been an especially important issue if the Joint Venture option had been pursued. It, however, was also important for the business model of transponder leasing eventually adopted by ANTRIX. The satellite system had to be configured so as to be compatible with the ultimate requirements of application in hand-held devices. This was to be developed over a period of time by Devas. The Committee, therefore, feels that while professionally FA-USA had Consultants with excellent experience in the field of Space and were well qualified at that point of time, their ability for developing the new system was not on record or proven. It was also not clear whether they had any intellectual property rights over these technologies. It was, therefore, not a case of mere Technology Transfer, but one that involved development of innovative technology, which always has an associated element of risk. In making these decisions, ISRO was, however, consistent with the goals that had been set out for ANTRIX operations. ISRO took risk in selecting FA-USA and planning its satellite launch on unproven technological capabilities. While the ANTRIX Board approved the proposal, primary responsibility lay with Secretary, DoS for this decision. ✓

3.3 INSAT Coordination Committee (ICC)

3.3.1 The SATCOM Policy had envisaged a critical role for the ICC, which is chaired by Secretary, DoS. The Committee which was formed in 1978 had held 78 meetings over the period 1978–2004. In the first meeting of ICC held on 23rd January, 1978, it had been decided that cases involving "Important matters of policy relating to the INSAT system, both Space and Ground-Segments" would be placed before ICC. In the SATCOM Policy approved by the Government on 12th January, 2000, the following provisions had been laid down:

"(i) As far as allocations to Department of Telecommunications, Doordarshan and All India Radio for their direct use on the existing

and planned capacity on INSAT satellites are concerned the existing practice shall continue. Planned capacity means the capacity projected by these agencies on a long-term basis and included in the configuration of a particular satellite or series of satellites.

- (ii) *ICC shall earmark at least a certain percentage of capacity for use by the non-governmental users who have been authorized by law to provide various telecommunications services, including broadcasting."*

3.3.1.1 In fact, the SATCOM policy assigned a major role for ICC in INSAT operations. The proposal of DoS for utilizing INSAT capacity for launching GSAT-6/6A for the ANTRIX-Devas project was never placed before the ICC. In fact, no meetings of the ICC have been held since 2004. As a result, none of the aspects of the ANTRIX-Devas agreement could be considered by the ICC.

3.3.2 This lapse had two major implications. First, ICC was the body for recommending utilization of satellite capacities by non-government users authorized to provide various telecommunication services. In the instant case, this matter never went before ICC. Earmarking of GSAT capacity for the ANTRIX-Devas project was thus a clear violation of Government policy. Secondly, the ANTRIX-Devas agreement had provided 90% of the transponder capacity of the first satellite PS1 and the same proportion of the capacity of the second satellite PS2 to be used for digital mobile multimedia services of Devas. This effectively meant utilization of a large part of the S-band spectrum reserved for BSS by one private user, ie. Devas. The use of transponders in this manner exclusively for one player was clearly against the approach adopted in the INSAT policy which was "non-exclusive".

3.3.3 The ICC was supported by a Technical Advisory Group (TAG), coordinated by Director, SCPO in the DoS. The TAG was informed of the proposal on 3rd November, 2004. TAG did not make any recommendations on this issue. It seems that the requirements of ICC were completely overlooked by the Secretary, DoS and Director, SATCOM, who were respectively Chairman and Secretary of the Committee respectively. They ✓

were, thus, primarily responsible for taking decisions without ICC authorization.

3.4 Spectrum

3.4.1 The L-band and S-band are generally used for mobile services due to their low frequencies and long wave lengths, which are suitable for broadcasting. Based on approved allocations by DoT, DoS holds 80 MHz of S-band spectrum for BSS in 3 orbital locations (viz. 74°, 83°, 93.5° E), and 70 MHz for MSS in 4 orbital locations (viz. 74°, 83°, 93.5° and 48° E, operable only at one location at a time). According to the National Frequency Allocation Plan, the 2535–2555 MHz (20 MHz) and the 2635–2655 (20 MHz) bands had been earmarked for Wi-Max through terrestrial services. In addition, 40 MHz (bands of 20 MHz each) for uplinking and downlinking had been earmarked for INSAT MSS and 30 MHz are planned for INSAT MSS. Thus, the GSAT had to operate within the remaining 80 MHz available in the S-band. With the launch of the GSAT-6 and GSAT-6A satellites as proposed under the agreement, nearly 50/60 MHz would have been utilized by Devas. Thus, a large part of the available BSS spectrum was being earmarked for these services.

3.4.2 DoS had requested ITU coordination for mobile satellite services to be used also for strategic operations. However, the spectrum usage planned by DoS was largely for commercial and societal applications. Strategic applications were mentioned in the ANTRIX-Devas agreement, but no allocation between strategic and commercial applications had been explicitly laid down. Although the demands of strategic applications at the time the agreement was signed were low, it was not prudent to assume that this would remain so in the future.

3.4.3 The Committee notes that three orbital slots were available with DoS for use in the S-band, 74° E, 83° E and 93.5° E. For each slot, the spectrum was available for 80 MHz in the S-band. Thus, while effectively 240 MHz (3x80 MHz) was available, in actual practice only one orbital slot

could be used for multimedia mobile services to avoid electromagnetic interference between signals.

3.4.4 The Committee has noted that in case of Japan and Korea, 25 MHz each is being used as the spectrum for providing satellite services. The US satellite DBSD G1 is currently using 20 MHz of spectrum in a similar band. It is therefore not clear why Devas needed such a large spectral bandwidth for their use. The Committee has examined whether these issues had been analyzed at any stage. The Shankara Report did not go into this issue in depth, and took the view that *"these frequencies are mostly unused and, hence, may be beneficially used for providing Devas services. It was also argued that the use of Devas MSS spectrum has been limited to a "certain band width". These including the MSS services and other INSAT systems can co-exist."*

3.4.5 The Committee has also considered the view point that as the orbit-spectrum allocated to India by ITU would have otherwise lapsed, the Devas proposal came at the right time for ISRO to make use of the orbital slot. If this issue was of serious concern, it should have been discussed in an inter-Ministerial ICC meeting with DoT, who represent Government of India in the International Telecommunications Union (ITU), the body which coordinates the slots. The Committee was informed that the limit for this orbital slot for India to use is likely to expire in May, 2011. Necessary steps will have to be taken by the DoT and ISRO so that we are able to make use of this quickly.

3.4.6

-SEVERED-

[in accordance with Section 8 (1) (a) of RTI Act 2005]

-SEVERED-

[in accordance with Section 8 (1) (a) of RTI Act 2005]

The Committee assessed this view and felt that from the national security perspective allocation of a large part of the spectrum and running of service by a private player like Devas was an unjustified risk from the security point of view. This issue seems to have been completely overlooked. It would have been appropriate to discuss the allocation of satellite capacity to service providers like Devas in ICC and based on their views, a well-considered assessment could have been made of how the national societal, commercial, technological and security interests would be best served. The decision to allocate almost the entire frequency to one company is clearly not prudent. ✓

3.4.7 Responsibility for the above failure relating to large allocation of spectrum and security needs primarily lay with Secretary, DoS and Director, SATCOM. Chairman, ISRO/ANTRIX Board must, however, share part of the responsibility. ✓

3.5 Commercial and Financial Terms

3.5.1 The agreement with Devas had envisaged leasing of ISRO transponders. However, there were other conditions also envisaged in the agreement which ISRO was expected to follow. The Committee considered the agreement in this perspective and noted that while the Shankara Committee had made some very useful suggestions on the draft agreement, there were several gaps. These are being mentioned in the following paragraphs.

3.5.2 The agreement was signed with Devas, a company whose paid-up capital was Rs.1,00,000 with two shareholders. ANTRIX/ISRO had committed investment of about Rs.800 crore on two satellites with a lot of other unusual concessions. ISRO was committing large funds for unproven

technology and with players who had very little financial stake. Clearly, this was financially weak.

3.5.3 The ANTRIX-Devas agreement was not simply for lease of transponders. It also cast upon ANTRIX responsibility for completing certain tasks as per the prescribed timelines. ANTRIX and its owner DoS had to launch the satellite in a period of 36 months. Failing this they were liable to a penalty of up to \$5 million, and beyond that would be liable for breach of contract. Thus, there was clearly a risk inherent in it. It was the first-time ISRO was going to use a 5.5 metre unfurlable antenna. Its earlier experience was limited to deployable antenna of 2.2 metre diameter. Secondly, space projects are often liable to delays for reasons beyond ANTRIX control. The condition for penalty, thus, cast a larger responsibility upon DoS. This was not reasonable from the perspective of the functioning of DoS and the risk they were taking, considering the uncertainty inherent in space launches.

3.5.4 ANTRIX had signed the agreement which was to become operational on their fulfilling the conditions envisaged under it. Under the agreement, Devas had the right to opt for a second satellite, which they subsequently did. When the agreement was made operational in February, 2006 there were no funds with DoS for building the second satellite. To sign an agreement committing funds and satellite priority without such a commitment from the Ministry of Finance was not correct. Unfortunately, the ANTRIX agreement never went before the Space Commission where the Finance Secretary is a Member. It did not even go to Cabinet, where approval would have entailed commitment for expenditure for the second satellite. Thus, this commitment for building a second satellite and the expenditure on it was without any financial authorization.

3.5.5 The lease charges for the transponders was \$9 million initially, subsequently increasing to \$11.25 million when Devas becomes cash-positive, which was expected to occur around the sixth year of the operation. The Committee has considered the financial analysis and

estimated cash flow and Internal Rate of Return (IRR). It has been computed that the IRR for the two satellites will be 13.8%. A copy of the analysis of IRR is at Annexure-VIII. If it was considered only for GSAT-6, it would have been about 13%. While this is reasonable, it does not include costs of launch and insurance for PS2, which would reduce the IRR. In respect of transponders, DoS had a policy that per transponder best amounts may be negotiated beyond the specified amount fixed by the Standing Committee (Annexure-III). However, this was a hybrid service where both terrestrial and space segments were to be used. No policy had been formulated by ISRO for lease of transponders in such a case.

3.5.6 The Committee also notes that an issue has been raised regarding the price of spectrum, which was to be leased to Devas for 12 years while leasing transponders. The Committee noted that the satellite would continue to be owned by DoS/ISRO. Secondly, the spectrum would be earmarked for DoS/ISRO. Thirdly, the leasing of Space transponders has so far been done for all segments of space under a certain policy. The policy has been to lease out the transponders based on cost computations made in various segments. A Standing Committee under Additional Secretary, DoS had been formed to finalize these rates. The market practice is for leasing transponder capacity to the users for a certain period. This was the business model adopted by ISRO in this case too, and it is difficult to find fault with this procedure.

3.5.7 The Committee also observes that the Space spectrum and the terrestrial spectrum have to be considered and priced differently. The space spectrum, which comes along with the transponders from the satellite either for DTH or other services, covers a very wide area. Each of the beams covers an area of say, 500 km radius or more. As against this, the terrestrial spectrum used in the same S-band may be used and reused with towers that are often separated at distances of order one kilometre or even less in urban areas, or 6-7 km in rural areas. As a result, the ground spectrum is far more efficient than the space spectrum in the same band. According to one of the experts that the Committee met, *"the terrestrial usage of spectrum may be 10,000 times more efficient even if*

the spectrum efficiencies in the space beam usage are improved by use of pencil beams. For broadcast purposes, however, there was no comparison where clearly the space platform has an edge." It is thus clear that the pricing of satellite-based use of spectrum has to be considered separately in this context.

3.5.7 The Committee further noted that for operationalizing the full service, Devas was required to obtain other licenses in the terrestrial segment for running the business of providing multimedia mobile services. During the Committee's interaction with Chairman, TRAI, the point of view emerged that the actual charges for the total spectrum being used by Devas had to be computed based on the following determination:

"A question was raised as to what would have TRAI done in the year 2005, if it was asked to give its recommendations on provision of mobile multimedia services through satellite and supported by ground segment in terrestrial mode.

The UAS license permits the licensee to provide multimedia services i.e. voice, video and data. Moreover, the UAS license is technology neutral i.e. it permits the licensee to use any technology based on standards issued by ITU/TEC or any other International Standards Organization/ bodies/ industry. It only mandates that in case the licensee is using the Satellite media, the LICENSEE shall abide by the prevalent Government orders, regulation or direction on the subject like Satellite communication policy, VSAT policy etc.

In view of the above, any company that wishes to provide Satellite based multimedia services will have to acquire a UAS license. However, this band was earlier not part of spectrum bands mentioned in UAS license, therefore, the DoT, before allocating this band to any operator for telecom services, would have to refer to TRAI for its recommendations on allocation procedure, price to charge for the spectrum and number of operators to be allocated the spectrum along with the block size etc. As discussed above, TRAI would have to undertake detailed consultations as per its practice before making any recommendations to the Government."

3.5.8 It is thus clear that the nature of service planned under this agreement, which envisaged telecom, telephony, internet, data transmission and video services, would need consideration by TRAI and subsequently by the Government on the procedure for allocation regarding prices to be charged for the spectrum and the number of operators to be allocated to the spectrum, along with the block size etc. Devas would have to pay, apart from other charges to ANTRIX, additional amounts as decided by the DoT and Ministry of I&B. In view of the above position, the Committee considers that concerns regarding spectrum having been sold cheap under the agreement have no basis whatsoever.

3.5.9 The shareholding in Devas and changes in it subsequently have also been a serious cause of concern. When the company was registered on 17th December, 2004, it had an authorized capital of Rs.20 lakhs. On that date there were only two shareholders to whom 10,000 shares worth Rs.1,00,000 had been issued. Subsequently, the shareholding pattern started changing rapidly. Many of the shareholders like M/s Deutsche Telekom Asia Pte. Ltd, CC/Devas (Mauritius) Limited, M/s Telecom Devas Mauritius Limited etc. came in by paying a huge premium. The total premium collected from these players was Rs.578.8 crore (It may be noted that of the original shareholders, only Shri M. Umesh reduced his shareholding). The number of shareholders thus increased from 2 (2004) to 12 (2006) and to 17 (2010). Many of these shareholders joined in 2007-09 by paying the huge premium mentioned above. The original proposal, which had envisaged development and innovation by some former ISRO scientists, seem to have been diluted with the entry of major foreign players. While technically this was permitted, the entry of foreign telecom companies with huge premiums indicated that they had used this as an opportunity for entering the telecom market, which had in the meanwhile expanded rapidly in India during 2005-10. This was not an intended purpose of the original agreement. To that extent, the safeguards in the agreement were inadequate to prevent it. This kind of risk management was not handled properly in the formulation of the agreement.

3.5.10 It is thus clear that concerns on short-selling of spectrum or selling it cheaply are not substantiated and have no basis. Responsibility for approving the agreement which had major financial and commercial weaknesses lay primarily with Secretary, DoS, who was Chairman, ANTRIX Board and Member (Finance), who have the responsibility to oversee financial matters.

3.6 Transparency in Functioning

3.6.1 The Committee noted three instances where the functioning of DoS has left major gaps. These are being mentioned below:

- (a) DoS had put up a note to the Space Commission for approval for making the satellite GSAT-6 for providing multimedia services (May, 2005). While at that point of time they had already signed an agreement committing 90% of the satellite transponder capacity for multimedia services to a private player, no mention of this vital fact was made to the Space Commission. It was merely mentioned that substantial capacity will be provided to private players. Subsequently, when this matter went to the Cabinet, the note put up was even more vague. It in fact mentioned that ISRO is already in receipt of several firm expressions of interest by service providers for utilization of this satellite capacity on commercial terms. The fact was that it had already signed an agreement and committed itself to Devas. During the course of the deliberations of the Committee, it has been noted that it had not been the practice in the past to mention the specific agency or company with whom any contract/agreement had been made, and the notes were in general terms. The Committee has considered this practice and finds difficulty to agree with the use of the same procedure in the case of the present agreement. This agreement was different from the previous ones insofar as it provided for upfront payments; option for second satellite, penalties on ANTRIX and a whole host of other conditions, including visit by Devas officials to ISRO for monitoring purposes. Further, the impression given to both the Space Commission and the Cabinet was as if there was no agreement yet

and ANTRIX/DoS had been approached by several potential customers. In view of this, the Committee felt that there was lack of transparency in the functioning of DoS.

- (b) For the manufacture of satellite GSAT-6A, when a note was put up to Space Commission, a very vague statement was made. It was mentioned that this was a successor to GSAT-6 and will augment the multimedia services provided by it. The total capacity of the spacecraft was committed for lease on appropriate commercial terms for providing multimedia and information services. It was not mentioned that it had already been done. The note did not give any indication that an agreement had already been signed and such a commitment had already been made to one party.
- (c) When placing the proposal for GSAT-6 before the Space Commission (May, 2005), it was important that a mention be made that the bulk of the S-band spectrum available with DoS then allocated to it was being committed in this manner. When this matter came up before the Space Commission on 29th October, 2009 for GSAT-6A, no such mention was made even then. This left the Commission completely in the dark. The note gave the impression that it was a normal activity of DoS for manufacture of satellites, and multimedia mobile services were proposed to be provided by the satellite. The question of spectrum allocation and its implications were not analyzed at all. Absence of full facts clearly weakened the decision making process in Space Commission and the Cabinet.
- (d) The cost of satellite GSAT-6A was clearly understated at Rs.147 crore because it omitted to include insurance, launch and other costs. This raises the question whether this was done to avoid having to seek Cabinet approval, required beyond Rs. 150 crore.

3.6.2 The responsibility for the above lay primarily with Director, SATCOM, who placed the notes before the Commission and Secretary,

DoS, who had full knowledge of the above being Ex-officio Chairman of ANTRIX.

3.7 Corrective Measures

3.7.1 Apart from the resolution of the legal issue, which will need to be followed up by DoS/ANTRIX, an important issue concerns measures to ensure that the orbital slot allotted for strategic services in 93.5° E, for which GSAT-6 and 6A were planned, is not lost due to delays in launch of the satellite. The Committee was informed that May, 2011 is the crucial date for this purpose. DoT/DoS should follow this up for a resolution.

3.7.2 The multimedia mobile satellite service has been launched in different countries, including US, Japan, Korea and has been planned in China. There is a need to develop comprehensive thinking on this subject for coordinating terrestrial 3G services with satellite services. The satellite services would be especially useful for societal applications, in natural disasters and communications in far-flung areas of the country where building towers for terrestrial communication may be difficult. Its usage for strategic purposes by Defence forces could also be developed. A coordinated view on these issues should be taken. DoS should discuss this question in ICC and set up an Expert Group in this regard. Based on its recommendations, an appropriate strategy for mobile multimedia services should be planned. Since we now have the benefit of experience of its functioning in other countries where 3G services are also available, it will be useful to learn from their experience.

3.7.3 Technology in these fields is evolving today rapidly. The orbit-spectrum resource is a very valuable natural resource. Efforts have to be made to augment its availability for the national use. Also it must be used in the most efficient manner which takes care of country's national and international interests. Technology must be brought to bear on this usage. Similarly, in the terrestrial segment spectrum usage has to be done in an efficient manner using the most modern technologies. This, too, is an area which requires extensive study. The Committee would, hence,

recommend that a Technical Group of Experts may be appointed by the Government either under Chairman, TRAI or Secretary, DoS, which can look at these issues. The Committee recommends that the entire problem should be discussed in ICC and immediate steps to chalk out a strategy for long-term efficient usage of orbit-spectrum resources is taken in the national interest.

CHAPTER - 4

THE REFORMS

4.1 While constituting the High Powered Committee, one of the Terms of Reference mentioned is as follows:

"To review the adequacy of procedures and approval processes followed by ANTRIX, ISRO and Department of Space and to suggest improvements and changes, taking into account the review mandated by the Space Commission at its 117th meeting held on 2nd July, 2010."

4.2 With the advancement of technology and rapid expansion of Space activities and applications, the systems and organizational structure of ANTRIX/ISRO evolved over the last four decades needs reforms to more effectively meet the changing requirements. These gaps have been particularly highlighted during the course of the consideration of the ANTRIX-Devas agreement by the Committee.

4.3 ANTRIX was set up in the 1990s after realizing the need for an interface with commerce and industry (both public and private) for development and commercialization of space-related technologies, products and services. ANTRIX was the commercial arm of ISRO, which was also expected to enhance exports as space activities in India and national capability for manufacture further expanded. Given the need for constant interaction with ISRO, access to all its technologies and knowledge of its potential ability for expanding in the export sector, a very close link was envisaged. It may in this context be noted that the Secretary, DoS was the Chairman of ANTRIX as well.

4.4 The activities of ANTRIX have expanded significantly, particularly after the transponder leasing services grew rapidly after 2000-01. The total revenue from these services went up from Rs.42.67 crore (2000-01) to a high of Rs.1,058.90 crore in 2008-09, and dipping to Rs.883.92 crore

(2009-10). Profits after Tax have increased from Rs.6.03 crore to Rs.109.40 crore in the same period. While the share capital of the company has remained at Rs.1 crore, its networth has increased to Rs.563 crore. Details of the growth of ANTRIX and its financial performance have been analyzed by the Review Committee constituted by the Department of Space.

4.5 We have considered the recommendations of the Review Committee of DoS (Annexure-XI). These recommendations fall in four categories, viz. (a) Issues relating to Board of Directors of ANTRIX and Corporate Governance, (b) Checks and Balances of DoS, (c) Separation of Regulatory, Policy and Executive Functions and (d) Developing a New Role for ANTRIX. We have considered the suggestions made by the above Review Committee and offer our comments below:

4.6 Matters relating to the Board of Directors of ANTRIX and Corporate Governance:

4.6.1 It has been recommended that even though the guidelines in Corporate Governance of Ministry of Corporate Affairs are not applicable to ANTRIX, it would be prudent to follow some of these guidelines. Accordingly, it is suggested that the tenure of the Part-time Directors may be fixed for three years with the option for renewal. It may be noted that the present independent Directors have been there since the constitution of ANTRIX (nearly 18 years). It has also been suggested that DoS should frame guidelines on such issues as the background of individuals who can be considered for appointment as Directors. We find these recommendations eminently suitable for the development of good governance practices in the corporation. ✓

4.6.2 It has also been suggested that an Audit Committee may be constituted under the chairmanship of an independent Director and a quarterly report of internal audits may be placed before the Committee for review.

4.6.3 It has also been recommended that ANTRIX adopt the practice of integrity pact with the contractors/vendors to the Corporation, as is being

currently done by many leading organizations in the country and abroad and for reputed persons to be appointed as independent monitors by the DoS.

4.6.4 We agree with the above two recommendations being necessary for strengthening good corporate governance.

4.6.5 It has also been suggested that the ANTRIX Board may be re-constituted with a full-time Chairman & Managing Director (CMD) or MD with an independent Chairman. Simultaneously, instead of Director (Finance), Joint Secretary (Finance) may be nominated as Director as in the Nuclear Power Corporation of the Department of Atomic Energy and other PSUs. Simultaneously, it has been mentioned that with a view to improve coordination, a Committee of Mentors chaired by Secretary, DoS may be constituted, which may include 2 or 3 eminent persons from among management professionals, economists and persons having experience and perspectives on science and technology. It is necessary for the rapid development of ANTRIX to have independent and effective inputs from ISRO and ANTRIX so that decision-making lines do not get blurred.

4.6.6 While a common Chairman between ANTRIX and ISRO had advantages in the initial years of ANTRIX formation, its continuance is no longer necessary. However, given the nature of activities of ANTRIX, which is basically a corporate arm of ISRO for various purposes, it will be important to have a close interaction. The Committee therefore does not recommend a separate Chairman. It will be more appropriate to have a CMD for ANTRIX. Simultaneously, a Coordination Management Committee (CMC) may be established, which should be chaired by Secretary, DoS/ISRO with three representatives from ISRO and three representatives, including CMD from ANTRIX. The CMC may meet once a month or more frequently, if necessary to ensure complete coordination between the two organizations. The CMD may also review, every quarter, action on the decisions taken in earlier meetings, suggestions for course correction and other measures. ✓

4.7 Checks and Balances

4.7.1 The Review Committee constituted by the DoS has made several recommendations for strengthening of checks and balances of DoS. Three of these recommendations are:

- “(i) The internal audit function under Chief Controller of Accounts may be strengthened by appropriate training and re-orientation of Internal Financial Advisers. The manual of internal audit may be reviewed and updated.*
- “(ii) Costing system of ANTRIX/ISRO needs to be strengthened. The Chief Adviser (Cost) in Ministry of Finance may be requested to conduct a study of the existing processes and suggest measures for enabling the centres to arrive at more realistic cost estimates. Wherever possible, the unit cost (actual vis-à-vis norms) should be estimated and be incorporated into the proposals. Chief Adviser (Cost) may also be requested to depute a senior officer like Joint Adviser to work in Department to facilitate the implementation of cost accounting procedure and inculcate cost consciousness. This will enable ANTRIX/ ISRO to make more realistic estimate of costs.*
- “(iii) A Legal Adviser (Internal Law) for DoS/ANTRIX Corporation may be appointed on deputation preferably from the National Law University or similar reputed institutions. Another Legal Adviser well experienced in Commercial Law (including contracts, arbitration etc.) may be taken on retainer basis.”*

4.7.2 The Committee feels that there is a need to strengthen the legal, financial and audit systems within the organization to ensure more effective functioning. The Committee feels, therefore, that these recommendations are quite appropriate.

4.7.3 Two of the other recommendations relate to the Secretariat of DoS, ISRO and SCPO. It has been emphasized that the programme office in ISRO Headquarters should provide inputs to DoS Secretariat. Similarly, it has been mentioned that the SATCOM Programme Office, which deals with issues of policy at the national level, may route its proposals (except

technical and programmatic matters) to Secretary, through DoS, to enable him to get administrative perspectives. Both these recommendations highlight the need for working out a mechanism so that the administrative, programmatic and policy inputs are appropriately married in decision making. The Committee feels that, while it is important to integrate these inputs, it should not result in unnecessary movement of files. The mechanism should, therefore, have to be further discussed in the light of experience of earlier Chairmen and how these have worked. The Committee, therefore, feels that while there is a need to have all inputs available for Secretary to take a decision, how that decision is eventually taken by him should be left to his judgment. However, the Committee does feel that while taking important decisions, inputs from administrative and technical policy wings should be available to Secretary, DoS, and he should work out a suitable decision process accordingly.

4.8 Separation of Regulatory, Policy and Executive Functions

4.8.1 The Review Committee constituted by DoS has recommended separation of regulatory, policy and executive functions. However, these are all proposed under the SATCOM Programme Office. One of their recommendations is:

"In accordance with the policy and regulatory framework required for operating in a liberalized economic environment, there should be a clear separation of the sovereign policy making functions, regulatory functions and executive (including service provider) functions in DoS. The SATCOM Programme Office may be headed by a Senior Director and have three separate Divisions headed by a Director level technical officer. The Director (SCPO) may deal with frequency monitoring and regulatory functions. The Director (Policy) may deal with policy making functions and interaction with Govt (including ICC, TAG and CAISS). The Director (Programmes) may deal with programmes, executive and service provider functions."

4.8.2 We feel ourselves that there is a need to separate the regulatory and policy/programme functions. The Committee agrees with the above recommendations. The Committee has also recommended that since

transponders involve regulatory and policy functions and Space assets are Government property, it is appropriate that the leasing should be done by DoS so that all receipts are credited to the revenues of the Government directly. Further, according to the Committee, leasing is to be done according to the guidelines of the INSAT Coordination Committee (ICC) and TAG. The present Committee is unable to agree with this recommendation. It has to be appreciated that the transponder leasing function is basically a commercial activity and the cost of leasing has to be competitive with the rates prevailing in the international market. Further, leasing of transponders for private players may also be negotiated by ANTRIX. While the Committee appreciates these transponders are owned by DoS, the existing practice of leasing by ANTRIX can otherwise continue. While these are to be leased in accordance with the ICC guidelines, any other safeguards which are required in addition to the above can be issued by DoS in consultation with ICC. It will, however, be appropriate to continue to permit these activities, which are commercial in nature, to be performed by ANTRIX.

4.8.3 It has also become necessary, in this context, that the Committee follow the recommendations of the Review Committee to put SATCOM policy on the website for purposes of transparency. The following recommendation, therefore, is appropriate:

"The SATCOM policy and such other guidelines issued from time to time and the administrative arrangements/procedures may be placed in a properly organized website of Department of Space."

4.8.4 Similarly, the recommendation on the sale of remote sensed data and services to international customers and leasing of foreign satellite transponders continue with ANTRIX as before is appropriate.

4.8.5 The following two recommendations deal with the interface between DoS and ANTRIX:

"On all matters of policy as well as issues involving international, political and diplomatic implications, the corporation should obtain formal clearance from DoS."

Commitments and contracts involving resources and funds of the Government/DoS should be got formally approved by the Department of Space before execution. This is necessary because of the integral relationship between DoS/ISRO and ANTRIX when it is functioning as an extended arm."

4.8.6 The Committee find that the recommendations on obtaining clearances of DoS where any international implications are involved or resources and funds of Government are being committed is eminently desirable. The recommendation, however, relating to the limit of Rs.75 crore beyond which approval of DoS and Space Commission is to be obtained, has to be analyzed in terms of current business activities. For the present turnover, this limit appears appropriate. It will, however, need to be reviewed every year. Secondly, it may be appropriate also to consider for approval those clauses in any agreement of ANTRIX which have serious technology implications. These issues could be discussed in the ANTRIX Monitoring and Coordination Committee suggested above, and then based on its recommendations approval of DoS and Space Commission could be obtained.

4.9 New Role for ANTRIX Corporation

4.9.1 The Review Committee constituted by the DoS has also made the following recommendations, which we find very appropriate and need to be implemented:

"For discharging any additional roles/functions, ANTRIX may have to move towards becoming a real corporation with distinct identity having a critical minimum full time staff drawn on placement-posting from ISRO/DoS. If necessary, in addition, it may also evolve a pattern of contract appointments in order to have engineers and experts in relation to specific work. They can be given a different remuneration package (if necessary at market rates) since their service conditions will not provide for pension and such other governmental benefits/facilities. This may also help in attracting Indians working in organizations and universities abroad and to bring in international standards and innovative technologies. In order to ensure that ANTRIX remains a lean organization, the

category and number of employees may also be included under the annual review to be put up to the Space Commission.

Although the exemptions given by the Ministry of Corporate Affairs may have to continue, greater transparency in working and in balance sheet may be aimed at.

DoS/ISRO have been procuring products and services from the private sector industry on competitive basis as well as through vendor development. Due to the limited market size, the participation of the private sector has remained at a comparatively low level. Therefore, DoS/ISRO may consider vendor development through ANTRIX. Firstly, ANTRIX can be a technology provider to the private sector and facilitate vendor development. Secondly, joint ventures with the private sector industry can be explored, where it is found desirable and feasible, for outsourcing the products and services required by DoS/ISRO centres. Thirdly, if required, even specific production facilities, which can be established at the expense of the Government, may be operated and managed by ANTRIX (Uranium Corporation of India Ltd., and Indian Rare Earths Ltd., under DAE manage certain production units for DAE as an operating agency). Thus, it can be an agency of DoS for adoption of the GOCO model (Government Owned – Company Operated facility)."

4.9.1.1 The Committee finds these recommendations quite appropriate.

4.9.2 The Space Commission was set up in 1972 when DoS was set up. It has over a period of years not been fully utilized. In the last 4-5 years, meetings of the Space Commission have been held only twice a year. It has, thus, met very infrequently. The Notes prepared for the Commission should show greater transparency. Many of the most important and critical facts, therefore, have sometimes not been placed before the Commission. The Committee, therefore, feels that these meetings should be held at least four times a year. Further, the Notes for these meetings should be prepared with great care and all major contracts of ANTRIX and the existing proposals under implementation should be reviewed by it, since many of these have security implications. They may be specifically

looked at from this angle to indicate whether there are any issues in this regard. In the meetings of the Space Commission, it is important that the conditions in the international markets in Space technologies are also discussed so as to indicate the directions in which ISRO is planning its activities. This will help development of a better understanding of the long-term vision of space activities.

4.10 The Committee feels that one of the biggest strengths of ISRO has been its open scientific temper where all questions are openly discussed and people are encouraged to ask questions. There is clearly a need to further strengthen this culture. It was noted that in the Suresh Committee Report (a copy placed at Annexure-IX), this issue was specifically referred to. When Dr. B.N. Suresh, Former Member, Space Commission met the Committee he observed that "there were no formal mechanisms to discuss with ISRO centres on the agreement between Devas and ISRO/DoS. Such formal discussions would have made the agreement more realistic and transparent within ISRO. In this context, the Committee supports the important recommendation made by him in his report as follows:

"On such important agreement/s which also attracts penalty clauses it is recommended to constitute a well-structured Standing Review Forum with members drawn from ANTRIX, ISRO/DoS and all other concerned agencies to review the status and criticalities in a formal way and suggest corrective actions wherever necessary for implementation by appropriate authorities."

4.11 The above recommendations only deal with some issues of ANTRIX/ISRO. There is a clear need for a regular peer review of ISRO every three years. Unless its administrative and scientific culture is constantly reviewed, checked and strengthened, there is a danger of slide back. This mechanism will help strengthen the organization.