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STAFF APPRAISAL REPORT

ROMANIA

TELECOMMUNICATIONS REFORM AND PRIVATIZATION SUPPORT PROJECT

MARCH 6, 1998

**Energy and Telecommunications Department
Country Department for Romania
Europe and Central Asia Region**

CURRENCY EQUIVALENTS

Currency Unit = Romania Leu (plural Lei)
1 US\$ = 8,142 Lei (February 26, 1998)
1,000 Lei = \$0.12

AVERAGE EXCHANGE RATES

Lei per US\$1

<u>1993</u>	<u>1994</u>	<u>1995</u>	<u>1996</u>	<u>1997</u>
760	1660	2070	3085	7168

WEIGHTS AND MEASURES

Metric System

ABBREVIATIONS AND ACRONYMS

CDMA - Code Division Multiple Access
CEE - Central and Eastern Europe
CIF - Cost Insurance Freight
DECT - Digital European Cordless Telephone
DON - Digital Overlay Network
EBRD - European Bank for Reconstruction and Development
EIB - European Investment Bank
EU - European Union
GIC - General Inspectorate of Communications
GNP - Gross National Product
GOR - Government of Romania
ICB - International Competitive Bidding
IRAC - Interministerial Radio Advisory Commission
LAN - Local Area Network
MOC - Ministry of Communications
MUV - Manufacturer's Unit Value Index
NAVC - National Audio Video Council
NSMS - National Spectrum Management System
OECD - Organization for Economic Cooperation and Development
PCS - Personal Communication Services
RDP - Regulatory Development Program
SOEs - State-Owned Enterprises
STS - Special Telecommunications Services
TCC - Telecommunications Consultative Committee
TDMA - Time Division Multiple Access
WAN - Wide Area Network
WLL - Wireless Local Loop
WTO - World Trade Organization

ROMANIA - FISCAL YEAR

January 1 - December 31

Vice President :	Johannes Linn, ECAVP
Country Director :	Kenneth G. Lay, ECC05
Sector Leader:	Peter Thomson, ECSEG
Responsible Staff:	Varadarajan Atur, Raghuvveer Sharma, Robert Taylor, Gultekin Yuksel Doina Visa, David Satola, Jose Escaffi , Neal Patterson (consultant)

ROMANIA

TELECOMMUNICATIONS REFORM AND PRIVATIZATION SUPPORT PROJECT

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ROMANIA
TELECOMMUNICATIONS REFORM AND PRIVATIZATION SUPPORT PROJECT
Loan and Project Summary

<u>Borrower and Beneficiary:</u>	The General Inspectorate of Communications(GIC)
<u>Guarantor:</u>	Romania
<u>Amount:</u>	US\$30 million
<u>Terms:</u>	Payable in twenty years, including five years of grace, at the standard interest rate for LIBOR-based US Dollar single currency loans.

Project Objectives : The objectives of the proposed Project are: (a) to assist Romania in reforming the telecommunications sector, including privatization of existing public sector telecommunications facilities; (b) to provide the necessary infrastructure to enable GIC to maximize the productive use of the radio frequency spectrum and to improve frequency assignment criteria for further expansion of wireless communications services provision by the private sector; and (c) to support GIC in performing regulatory functions over all networks and services in the telecommunications sector.

Project Description: The proposed Project includes the following: (a) Non-Lending Services and Advice for *Sector Reform* which involves the design and implementation of an appropriate set of policy, legal and regulatory frameworks for the reform of the telecommunications sector leading to attracting new private investment and privatization of Rom Telecom; and (b) Lending Services for Technical Assistance for *Regulatory Agency Development* which involves capacity building for the independent regulatory agency for regulation of all networks and services in the telecommunications sector, including equipment and services for installing a national network for radio frequency spectrum management and monitoring.

Project Benefits : Expanding Romania's telecommunications sector to private investment through reform will have a number of financial and economic benefits. The financial benefits accrue to Government of Romania (GOR), Rom Telecom and to private operators. The financial benefits are: (a) private capital infusion into Rom Telecom; (b) incremental revenues through annual spectrum usage fee from expanded and improved use of the spectrum; (c) revenues to GOR that accrue through the award of licenses to operators for new spectrum based services (e.g. the recent GSM license award fetched GOR US\$ 100 million); and (d) revenue benefits to private operators. There are also economy-wide benefits which cannot be quantified. These include: (a) the inflow of private investment with the attendant increase in consumer choice, improved service quality and greater competition with real tariff reductions; (b) expansion of the sector, growth in employment opportunities and growth in the size of the telecommunications markets; (c) achieve more efficient use of Romania's radio spectrum resources, which will bring about technological advances especially in the areas of wireless services and broadcasting; and (d) support the macro stabilization program. The Project would enable Romania to enlist in the global alliances in telecommunications and thus take advantage of the revolution in communication and information exchange. The Project would also demonstrate a successful liberalization model for emulation by state economic enterprises beyond the telecommunications sector.

Project Risks : The proposed Project faces three types of risks. Policy risks may entail derailment and/or reversal of sector reforms. This risk is small because the new Government is pro-market and has strong support for undertaking reforms. Romania's successful reforms in liberalizing the advanced telecommunications services sector, the passage of the new Telecommunications Act in 1996 and the agreements reached with the WTO concerning liberalization attest to the commitment of the successive governments to the reforms in this sector, and the current government is even more committed to

broadening and deepening the reforms. Also, Romania's desire to join the EU, demand from private sector and the general public for more efficient and expanded access, the sweeping and successful reforms taking place in this sector in all countries, including in Eastern Europe, should provide further impetus to implement the reforms. Implementation risks resulting in delays in implementation of NSMS are mitigated by the fact that there would be only one turnkey contract which will include supply & installation, and that project management consultants would be recruited before effectiveness. As regards market risks, telecommunications is a growing and profitable sector and has attracted investor interest worldwide. The growth potential of this sector in Romania makes it an attractive investment to many telecommunications companies which have substantial resources for investing in foreign telcos.

Project Costs and Financing Plan (1998-2002): (US\$ million)

Description	Local	Foreign	Total	% Foreign Exchange
<u>Sector Reform</u>		1.8	1.8	100
<u>Regulatory Agency Development</u>				
NSMS	3.0	32.8	35.8	92
RDP	0.2	1.0	1.2	83
Capacity Building		0.7	0.7	100
Total Base Costs	3.2	36.3	39.5	92
Physical Contingencies	0.5	2.4	2.9	83
Price Contingencies ^{a/}	0.3	1.3	1.6	79
Total Project costs	4.0	40.0	44.0	91

^{a/} Using International Inflation Index (MUV Index).

	Local	Foreign	Total	%
GOR/EU	-	1.8	1.8	4
GIC	4.0	8.2	12.2	28
Proposed Bank Loan	-	<u>30.0</u>	<u>30.0</u>	<u>68</u>
Total Financing	4.0	40.0	44.0	100

Disbursement Schedule: (US\$ million)

Bank FY	FY99	FY00	FY01	FY02
Annual	9.00	14.16	5.59	1.25
Cumulative	9.00	23.16	28.75	30.00

Economic Rate of Return: Not Applicable.

Poverty Category : Not Applicable

Map: Not Applicable

Project ID Number: RO-PA-8788

ROMANIA

TELECOMMUNICATIONS REFORM AND PRIVATIZATION SUPPORT PROJECT

STAFF APPRAISAL REPORT

I. SECTORAL SETTING

A. Country/Sector Background

1.01 Romania ranks as a lower middle-income country, with a GDP per capita of some US\$1,440 in 1996. This places it somewhat behind its neighbors such as Hungary, Slovakia, the Czech Republic, Poland and the Russian Federation. Its population of 23 million ranks second amongst the CEE states and is larger than 10 of the present 15 members of the EU. This, together with its favorable endowment of natural resources, gives the country great potential. But state-ownership remains a dominant model: the share of GDP accounted for by the private sector (a little over 50 percent) is one of the lowest in the CEE. Furthermore, during the 1990s, it has proved difficult for Romania to achieve the macroeconomic stability it has sought to lay the foundation for sustainable growth.

1.02 After periods of stop-and-go macroeconomic policy, the Government of Romania (GOR) launched a new reform program in early 1997. Difficult challenges were faced in terms of restoring discipline in fiscal and monetary policy, which had been relaxed significantly during 1996, and accelerating much-needed structural reforms. Key components of the reform program included prudent monetary policy, a sound fiscal stance, and a deepening of the privatization drive. After a strong start to the reforms through the first half of 1997, progress had slowed somewhat by early 1998, with signs of inflationary pressures re-emerging and inadequate financial discipline in the enterprise sector. Nonetheless, the Government has reaffirmed its commitment to privatization, and announced an ambitious schedule for major enterprise sales during 1998. It attaches particular importance to securing strong private involvement in infrastructure sectors, including telecommunications and power, which it views as a main route to improving the infrastructure needed to support private sector led growth.

1.03 The availability of efficient telecommunications services is critical to the successful transition to a market economy, since many of the targeted reforms, e.g. industrial/enterprise privatization, financial sector restructuring, private sector development, will need a wide range of reliable telecommunications services. The effectiveness of telecommunications services also affects Romania's international competitiveness. The transition to a market economy has nearly doubled the demand for telecommunications services in Romania; however, the infrastructure to provide these services does not have the capacity to meet the demand, is worn-out and is of antiquated technology. In order to promote development and modernization of the sector, GOR supported the construction of a digital overlay network, allowed private sector participation in the provision of advanced services, issued two licenses for GSM mobile telephony to expand coverage nationally and introduce competition, and passed a new Telecommunications Law. However, sectoral developments still lag behind targets; the growth and expansion of advanced services and introduction of new services (e.g. PCS) are constrained by the slow pace in the modernization and expansion of the wireline network, which in-turn has been constrained by the lack of adequate financing and availability of radio frequency spectrum. Hence, consistent with its broader economic strategy, GOR has decided to privatize Rom Telecom, the national public operator, and liberalize the telecommunications sector to make available the full range of telecommunications services in Romania in a free and competitive market environment. In response to GOR's request, the proposed Project is designed to provide the necessary assistance to GOR to assist in the design and implementation of an

appropriate strategy for the reform of the telecommunications sector, including privatization of Rom Telecom.

B. Project Setting

1.04 Romania needs about US\$5 billion over the next decade to meet the demand for telecommunications services which are growing at a rate of 12% every year. This large funding requirement results from its current low penetration of telephones (number of telephones per one hundred population) of about 16 (compared to OECD average of over 40), the need to replace a substantial part of the existing worn-out network and the growth in the economy and is too huge for financing by the public sector. Therefore, private sector should be brought in through privatization of Rom Telecom and liberalization of the sector. Second, competition should be introduced in all areas of telecommunications services to improve technical and economic efficiency. Third, as the number of service providers increases, a competent regulatory framework to, *inter alia*, oversee interconnection of networks between operators, competition and economic regulation is critical for ensuring proper functioning of the sector.

1.05 Given the fact that wireless communications have become an integral part of telecommunications services, regulation should encompass both wireless and wireline communications. Exploiting wireless communication opportunities requires availability of appropriate radio frequencies to the private sector and proper monitoring of the spectrum to eliminate or minimize interference which affects the quality of service. Proper planning, utilization and management of radio spectrum will enable the existing operators to improve the quality of their service and the introduction of newer services in Romania. Romania's management of the radio spectrum - carried out by the General Inspectorate of Communications (GIC) - needs to be modernized and market-oriented methods of allocating spectrum to newer services/operators should be introduced.

1.06 Sector reforms which address the above issues and attract private investors into Romania should be adopted and implemented. Therefore, GOR has decided to:

- a) restructure the telecommunications sector to increase the efficiency and its attractiveness to private investments, and privatize Rom Telecom;
- b) introduce competition and expand communications services through liberalization; and
- c) develop an independent agency for regulation of the sector, including allocation, monitoring and management of radio frequencies.

These measures, if implemented properly and in a timely fashion, will make available the full range of telecommunications services in Romania in a free and competitive market environment. A new Telecommunications Law has been enacted (1996), agreement has been reached with the WTO on a timetable for liberalization (GOR Ordinance No.1 dated January 19, 1998) and a number of studies have been completed with the help of international consultants (Coopers & Lybrand of UK, Teleconsult of Canada, BR Communications of USA, etc.) to provide the basis for initiating the reforms. The GOR has asked the World Bank to assist in the implementation of sector reforms.

C. Rationale for Bank Involvement

1.07 The Bank has been involved in guiding GOR on sectoral reforms, beginning with a sector study in 1992/93 and subsequently in the design and financing of various studies through Canadian Trust Funds, USTDA funds and PHRD funds, as well as in the recruitment of advisors for the privatization of Rom

Telecom. In order to ensure sustained development of the sector, private investments should be attracted into Rom Telecom as soon as possible and competition introduced through liberalization. However, to realize such private investment, the sector reform needs to be designed and implemented, which would include advising the Government on the privatization of Rom Telecom. Accordingly, through the proposed Project, the Bank would assist GOR to establish an appropriate set of policy, legal and regulatory frameworks, including the establishment of an independent regulatory agency for the sector, to facilitate privatization of Rom Telecom and liberalization of telecommunications.

1.08 The proposed project is consistent with the Bank's Country Assistance Strategy, discussed by the Board on June 3, 1997, which supports, inter alia, macroeconomic stabilization, privatization of state-owned enterprises, and enhanced private sector involvement in the provision of infrastructure services. The proposed Project will build on the objectives of the ongoing FESAL (Ln.3975-RO) by broadening and deepening reforms leading to liberalization and private sector involvement in the economy. The proposed Project will also make a demonstration effect on other sectors (e.g. power, railways) for reforms, privatization and private sector development.

II. THE TELECOMMUNICATIONS SECTOR

A. Institutional Setting

2.01 The institutional structure of Romania's communications sector is provided in Table 2.1.

Table 2.1: Structure of Romania's Communications Sector

Subsector	Policy	Regulation	Operation	Ownership
<u>Telecommunications</u>				
Telephony	MOC	MOC	Rom Telecom	Public
Cellular	MOC	MOC/GIC	Private	Private*
VAS	MOC	MOC/GIC	Private	Private
<u>Broadcasting</u>				
Radio	MOC/NAVC	MOC/GIC	Rom Radiocom	Public/Private**
TV	MOC/NAVC	MOC/GIC	Rom Radiocom	Public/Private**
Cable TV	MOC/NAVC	MOC/GIC	Private	Private

* One is a joint venture with private sector

** Carrier is public; service is both public and private sector

The Ministry of Communications (MOC) is responsible for sector policy and regulation of telecommunications, and is assisted by the Interministerial Radio Advisory Commission (IRAC) in radio frequency spectrum allocation policies. The MOC is responsible for technical aspects associated with the issue of broadcasting licenses by the National Audio Visual Council (NAVC), which is responsible to the Parliament for issue of licenses for radio and TV broadcasting stations and CATV/Cable TV operators, including specification and supervision of program content. The GIC is responsible for technical regulation of all broadcasting and non-governmental wireless communications in Romania, including management of the radio frequency spectrum, an important part of the communications infrastructure. Rom Telecom owns and operates the fixed wireline telecommunications network and is a monopoly provider of basic telecommunications services. Several private operators provide cellular and other value added

services, some in joint venture with Rom Telecom. Rom Telecom is now a joint stock company (converted from a Regie Autonome pursuant to GOR Decision No. 673 dated October 25, 1997). Romanian Radio and Romanian Television are responsible for all public radio and TV programming. The recently established private radio and TV programmers also broadcast their programs using the radio network owned and operated by Rom Radiocom. The GIC and Rom Radiocom are Regie Autonomes (state enterprises) under the MOC (created in July 1991 under Law 15/1990), which are autonomous and required to be financially independent and cover the costs of their services. They operate under the Romanian Commercial Code and are accountable to the MOC through an annual Management Contract (MC). The MC stipulates annual objectives, specific performance targets, development plans, etc. Rom Telecom was converted into a joint stock company in October 1997 as a first step towards its privatization.

B. Telecommunications- Rom Telecom

Organization and Management

2.02 Rom Telecom is governed by a 7 member Administrative Council appointed by the General Assembly of Shareholders and is presided over by the President of the Council. The Administrative Council appoints the Executive Management of Rom Telecom, consisting of the Director General and 3 to 5 Executive Directors, with responsibility for operational departments, (currently Development, Finance, Technical and Commercial Departments). Rom Telecom is organized with a headquarters in Bucharest and offices in each of forty-one judets. In 1997, Rom Telecom had a staff of about 51,165 with about 70% belonging to the trade union.

The Telecommunications Infrastructure

2.03 Rom Telecom's national infrastructure is dominated by old analog technology in all parts of its network. Modernization began in 1991/92 for the construction of the ongoing digital overlay network (DON), a major part of which has been completed. The DON consists of a 7,000 km of fiber optic cables (with 20 and 12 fibers) equipped with SDH and PDH transmission systems. They link eight digital transit exchanges and 1,400,000 subscriber lines connected to digital switches. The DON, with a total cost of about US\$ 850 million, is financed by EBRD, EIB, kfW and other bilateral credits and Rom Telecom. The digitalization achieved in the overall network is about 40% in switching and 50% in transmission, but is still small for realizing any appreciable improvement in the quality of service. Technical details pertaining to Rom Telecom's network are summarized as below:

Switching At present, the total switching capacity for the public exchange in service had 3.6 million lines and comprises: Rotary 7A and 7D, designed more than 70 years ago and in service for as long as 55 years (10%); Crossbar Pentaconta, designed more than 40 years ago, manufactured in Romania until 1993 and in service for 20 years (41%); manual operated (9%); and digital, recently provided by joint ventures with Siemens and Alcatel (40%). Toll switching equipment are largely analog electromechanical and manual with only eight digital toll switching equipment units. International communications are switched through one automatic digital transit switch and one semiautomatic Pentaconta switch, and incoming calls are served automatically to the end subscriber while outgoing calls are served automatically for those connected to digital switches and through operator for others. The ratio of incoming/outgoing calls is about 1.3, down from 2.3 in 1991, due largely to the increase in outgoing calls. The international traffic is carried on the INTELSAT satellite system through two Standard A earth stations, one EUTELSAT earth station and on terrestrial routes to neighboring countries.

Transmission. The long-distance network comprises 100,000 trunks. The digital transmission is based on PDH-140 Mbps and SDH STM-4 technology. With the exception of low capacity 34 Mbps digital microwave links, the long-distance transmission facilities consist of mainly analog systems such as microwave links operating in the 2, 4, 6, 7 and 8 GHz bands, and coaxial cables with the capacities of 960, 1,800 and 2,700 channels of telephone circuits. Microwave links are more than 20 years old, and operated and maintained by Rom Radiocom which leases the circuit capacity to Rom Telecom on radio channels of 960 or 1,800 circuits. Nearly 50% of transmission is now carried on the new fiber optic cables of the DON.

Local Access. The local access network (also called local loops) is structured as a rigid network which comprises transport cables between the main distribution frame of the switch and the terminal boxes installed on poles and walls, and drop wires extended from the terminal boxes to the subscriber's premises. The most commonly used transport cables are made of copper conductors with paper insulation and are protected in ducts. The total length of cable in ducts amounts to over 380,000 km. However, most of these cables are at least 30 years old and in a bad condition due to breakdown of insulation. The drop wires are 0.9 mm galvanized steel wire locally manufactured and insulated with PVC. Modern wireless technologies have been introduced on a pilot project basis in several locations; these include: (a) CT2 cordless telephone from Orbitel, UK, using the 864 - 868 MHz band, in Sibiu (1996) and Brasov (1997); (b) Digital European Cordless Telephone (DECT) from Ericsson using the 1880-1900 MHz band in Snagov (about 1,200 subscribers; to determine the EMC compatibility with the Ministry of Defense users in the same band); (c) TDMA equipment from Ericsson in the 1880-1900 MHz band in Iasi for about 1,000 subscribers); and (d) CDMA equipment from Orlanda, Netherlands, using the 3640-3740 and 3850-3950 MHz bands in Arad for about 1,000 subscribers.

Telecommunications Services

2.04 The access to services, types of services available and their quality are summarized below.

Access to Service. At present, Romania's penetration (ratio of Direct Exchange Lines to 100 inhabitants) is about 16 which is the second lowest in Eastern European countries. There are 9,800 localities with telephone services in Romania, of which 380 are connected to the long distance network. Some 3,000 rural communities have no telephone services. The residential lines are the majority, and the business lines account for only about 12% of all the lines. 22% of the lines are in Bucharest. The new digital switches installed in major cities such as Bucharest, Brasov, Galati and Cluj are mainly used for business subscribers. There are still more than one million waiters, equivalent to almost half of the existing customer base, and the current waiting time for the telephone installation is more than 4 years.

Types of Service. Basic telephone service (local, long distance and international telephony) is provided by Rom Telecom. Besides the basic telephony services, there are some traditional and advanced services in Romania. Regarding the traditional services, national telegraph services had 4.2 million notes in 1993, and about 8,000 subscribers for telex services with fully automatic access to most countries of the world. Advanced services, such as private network services and packet switched services, are provided by several private operators, some in joint venture with Rom Telecom. One of the private network services is provided by a new private company, using VSAT technology for the National Bank and some industries. The packet switched services have about 2,000 customers, provided by a joint venture between Rom Telecom and France Telecom (Rompac), which compete with another company established by US Sprint (now Logic Telecom). An analog NMT-450 cellular service (joint venture established in 1992 between Telefonica of Spain and Rom Radiocom and Rom Telecom) had about 20,000 subscribers at end-1996. GOR issued in November 1996 two more licenses for national cellular service (GSM) to two joint ventures, one led by France Telecom and the other by

Telesystem Wireless of Canada and Airtouch of USA. The number of cellular telephone users is projected to increase to over 1.3 million in the next decade.

Quality of Service. The quality of telecommunications service in Romania is judged as one of the poorest in the Region. The system average call completion rate is about 50%, quite low compared to international norms of 70%. This is attributed to the congestion in the network resulting from the bottlenecks caused by the lack of traffic handling capacity in the switching and transmission facilities. This has resulted in a fault rate of 1.2 faults per line per year in the system, higher than norm of 0.2. Much of the faults occur in the local access network (48%) and only 19% in the switching and transmission part. Rom Telecom's response time to clear the faults compares quite favorably to the industry norms, with 74% cleared within 24 hours and 85% within 48 hours.

Financial Aspects

2.05 The financial affairs of Rom Telecom are governed by Law 31/1990 which regulates all joint stock companies. Rom Telecom's investments are reviewed and approved by the General Assembly of the Shareholders (presently represented exclusively by the State Ownership Fund, prior to privatization), and its tariffs for basic services are reviewed and approved by the MOC and the Office of Competition. Rom Telecom can raise funds for investments with or without government guarantee. The relevant financial aspects are summarized below.

Revenues: Rom Telecom derives its revenues principally from basic telecommunications services. Revenues from business sector accounts for nearly 75% of the total; similarly, long distance and international revenue account for over 70%. Revenues increased from about \$300 million in 1995 to about US\$ 347 million in 1996, and is estimated to be US\$ 400 million in 1997. The revenues from other services has increased consistently representing about 10% of total revenues during 1995, and is expected to grow further in the coming years.

Tariffs: Rom Telecom's tariff structure is determined by its Administrative Council, but tariff levels and increases are reviewed and approved by MOC and MOF. Rom Telecom's tariff structure is similar to those in other countries and is characterized by large differences in rates between residential and business customers and also between local, long-distance and international rates. Quarterly adjustments to tariffs have now been introduced. Also, local calls which used to be charged at one pulse per three minutes are now charged at one pulse per minute, both to reduce congestion in the network and to increase revenues. The revenue per line from a residential subscriber was about \$44 in 1996, while the same from a business subscriber was over \$400. The rebalancing process has already begun, with local calls within judets and long distance calls outside judets.

Investments Rom Telecom's investments in capacity expansion and modernization over the 1992-97 period was about US\$ 900 million, over 60% of which were financed by EBRD, EIB and other bilateral sources and the balance was financed by Rom Telecom's operations. The bulk of the investments were made in the digital overlay network (DON) providing the digital backbone of high capacity transmission and switching.

Issues to be Addressed

2.06 The issues in the sector involving Rom Telecom are summarized as follows:

- The rate of expansion of the network with new digital technology and replacement of worn out parts of the network is slow (about 200,000 lines per year) and has resulted in only marginal improvements in the quality of service (since the bulk of the network is still old technology). Unless this rate is significantly accelerated, the benefits of the large investments thus far will not be fully realized and the demand would continue to be unmet, frustrating the growth of the emerging private sector. Further, growth and expansion of advanced services and introduction of new services (e.g. PCS) will depend on the pace of modernization and expansion of the wireline network..
- The demand for telecommunications services has nearly doubled since 1989 and the same for advanced services are growing rapidly. The current waiting list exceeds one million and projections show the need for expansion of the network to over 7 million lines by 2005 from the current 3.5 million lines, a substantial part of which needs to be replaced at the same time requiring investments ranging between US\$ 5-7 billion. This is too huge for financing by the public sector and the competing demands on the scarce public resources (e.g. health, social sectors, etc.) further constrain the ability of the public sector. Hence, private sector investments are essential to meet the growing demand; also Rom Telecom should be privatized to relieve public financing burden.
- The rapid advancement in communication technologies has removed the technical and technological barriers to entry into basic service and has greatly increased the means and the efficiency of the delivery of these services, at the same time dramatically decreasing the associated costs (e.g. wireless local loops). In order for the subscribers and the general public to derive the benefits of lower costs and improved service, other service providers should be encouraged to operate and compete in the sector. Considering the potential for investment in, and expansion of, the telecommunications market in Romania, there could be a number of operators providing one or more of the basic and advanced services thus offering choice to subscribers. This would require that the telecommunications tariffs for basic service be liberalized and the sector opened to competition as soon as possible.
- Rom Telecom should evolve into an efficient operator with commercial orientation in order to meet the challenges of competition ahead. Infusion of modern management expertise into the utility is necessary for such evolution.

C. Broadcasting- Rom Radiocom

Organization and Management

2.07 Rom Radiocom is headed by a Director General, who also heads its Administrative Council, comprised of representatives from the MOC, MOF, STS and other bodies, and is assisted by Directors for Technical, Finance & Administration, and Legal functions. It is headquartered in Bucharest with four Regional Directorates. About 65% of its 2,700 staff are engineers or radio communications technicians.

Infrastructure and Operations

2.08 Rom Radiocom owns and operates all broadcast transmission facilities throughout Romania which includes microwave facilities, radio & TV transmitters and earth terminals for satellite communications. The network is geographically extensive and carries about 50% of all telecommunications transmission traffic and all of broadcasting. The three radio networks which utilize a total of 124 transmitters and 4

retransmitters are used for both telecommunications and radio/TV broadcasting transmission. The three earth terminals at Cheia are the main satellite gateways for Romania and Rom Radiocom represents Romania at international bodies such as Intelsat, Eutelsat and Inmarsat for satellite communications. With the exception of the recently commissioned 150 km digital microwave link between Bucharest and Brasov, all facilities operate on old analog technology. Rom Radiocom is also a joint venture partner in Telefonica Romania for cellular service (para 2.04).

2.09 Rom Radiocom's customers are corporations and businesses which lease its facilities for radio & TV broadcasting and telecommunications. Customers include Rom Telecom, Romanian Radio and Romanian Television, Renel (electric power company), Petrom (national oil company), several private radio and TV program operators, paging & cellular telephone operators, agencies such as forestry, public works, etc. Rom Radiocom derives about 70% of its revenues from broadcasting and about 30% from telecommunications services. Fees for leasing and other services are set by Rom Radiocom, usually through negotiations assisted by the MOC. Rom Radiocom has been able to finance previous modest investments from own resources, however, the large investments required to modernize and expand its facilities cannot be financed by Rom Radiocom.

Issues to be Addressed

2.10 The issues encompassing both broadcasting and telecommunications involving Rom Radiocom are as follows:

- The number of operators using Rom Radiocom's network has increased rapidly, from a few in 1989 to over 75 operator-licensees now, as a result of the Audio and Visual Act passed in 1992 to allow private sector entry into broadcasting and value added services. The services include private radio and TV, data communications, paging, cellular telephony, etc., and account for most of the radio frequency spectrum use by the private sector. The quality of service (clarity in communications, interruptions, etc.), however, is not up to the required levels due to lack of adequate capacity (bandwidth and channels) on the current network and the large number of users. Also, only about 18 of the 45 authorized radio licensees are operating (end-1996), and on low power, due to interference problems, which has limited their coverage and expansion. Operation of other private radio stations, the coverage of new GSM cellular service and competition between them is critically dependent on proper monitoring of the spectrum to minimize interference.
- Technologies are evolving rapidly and convergence is increasing between broadcast communications, data communications and telecommunications sectors, particularly in the digital domain; such convergence, together with complementary technologies of data compression and re-use of air waves (radio spectrum), is making wireless communications viable, not only for newer telecommunications services (e.g. PCS), but also for basic service, especially in remote and rural areas (para 2.03). However, exploiting wireless communication opportunities requires availability of appropriate radio frequencies to the private sector and proper monitoring of the spectrum to eliminate or minimize interference which affects the quality of service. Also, the availability of frequency band would need to be increased from the current allocation of only 70 MHz for such new services, through proper assignment and management of the spectrum. The infrastructure for monitoring spectrum is old and of outdated technology and needs to be modernized.
- Convergence of technologies when deployed would also make the operation and markets in some segments to overlap between Rom Telecom and Rom Radiocom. While this could expand the market domain of Rom Radiocom significantly, there is a need to rationalize the wireline and

wireless infrastructures so that the most efficient combination of technologies (satellites, fiber optic cables, radio communications, etc.,) are deployed for broadcasting and telecommunications. Also, this would help optimize the productive use of scarce frequency spectrum. Such rationalization is best achieved through market forces. Hence the telecommunications market should be liberalized as early as possible and Rom Radiocom should also be privatized; considering that Rom Radiocom's assets serve both broadcast and telecommunications together, options for its privatization would need to be carefully reviewed to ensure liberalization of the market in line with the WTO agreement (para. 1.06). Also, transparent and market-oriented methods of allocating the spectrum to newer services/operators should be introduced.

D. Regulation

2.11 The responsibility for regulation of the sector is shared by the MOC and the GIC, but other agencies such as the Office of Competition in the Ministry of Finance and the Competition Council would also be involved as necessary. A telecommunications consultative committee (TCC), which has been recently formed consisting of representatives from the MOC, GIC, public and private operators, manufacturers, industry associations and the general public, is intended to provide input to the MOC on both policy and regulation. MOC issues all operator licenses and principally carries out economic regulation, especially for basic services, while GIC carries out all technical regulation of the sector, including allocation, monitoring and management of the radio frequency spectrum. GIC carries out spectrum monitoring activities from its four regional control centers in Bucharest, Cluj, Iasi and Timisoara.

2.12 In the MOC, three main Directorates - one each for Regulations, Strategy and Economic Planning - share the policy and regulatory responsibilities. The organization chart of MOC is provided in Annex 1. The main functions and responsibilities of MOC are summarized as below.

- Represent Romania at appropriate international fora (e.g. ITU, EU, WTO, etc.)
- Set overall sector policies, and technical standards for equipment conformance and interconnection
- Issue operator licenses and authorizations for radio spectrum allocation in coordination with IRAC as appropriate
- Set and regulate service and quality standards, including interconnection aspects
- Set and monitor performance of Rom Telecom and Rom Radiocom in accordance with their respective Management Contracts
- Resolve complaints and arbitrate disputes
- Monitor overall sector performance

2.13 The GIC is responsible for technical regulation of the utilization of the radio frequency spectrum for all non-government users and supports the MOC in setting policies concerning spectrum matters. The details of GIC's organization and operations are provided in Annex 1. The main functions of GIC are summarized below.

- Prepare spectrum related policies for approval by MOC and liaison with all agencies on technical issues
- Maintain national register of spectrum assignments, process and issue authorizations for frequency assignment and monitor the use of assigned spectrum
- Issue permits for equipment and enforce conformance
- Receive and resolve interference complaints

Issues to be Addressed

2.14 The issues to be addressed concerning regulation are summarized as follows:

- In order to attract private investments into the sector, an appropriate regulatory framework to oversee both public and private operators on a transparent basis should be established and enforced by an independent agency. Regulatory oversight involving, inter alia, interconnection of networks between operators, competition and economic regulation is critical for ensuring proper functioning of the sector and for promoting liberalization. Also, policy making and regulatory responsibilities should be separated.
- Political non-interference in regulation should be ensured through operational autonomy (e.g. appointment of regulators on transparent basis and on professional capability) and financial autonomy (e.g. financing regulation from regulatory services and complete independence from the budget). Involvement of stakeholder bodies such as the TCC should be actively encouraged and their roles defined.
- Given the fact that wireless communications have become an integral part of telecommunications services, regulation should encompass both wireless and wireline communications.

E. Government Strategy

2.15 In order to address the issues in the sector, GOR has decided to implement a reform program as follows:

- **Industry Structure**: The telecommunications sector will be restructured to facilitate the introduction of competition, privatization and private sector development. Rom Telecom and Rom Radiocom's infrastructures and their business services would be examined for appropriate consolidation and/or restructuring in this regard. Upgrading of the radio communications network to digital technology to improve quality of service would be undertaken subsequently, and after examining its feasibility. Entities such as the Renel (power utility), Conpet (petroleum pipeline company), Romgaz (gas pipeline company), Railways, etc., which have their own private telecommunications networks will be allowed to offer their infrastructure and/or services either by themselves or in joint venture with others.
- **Competition**: Competition in all telecommunications services will be encouraged and expanded through market based policies and regulations. Interconnection and non-discriminatory access to networks will be ensured to promote competition. Tariff reforms, including rebalancing, will be pursued to support introduction of competition in basic telecommunications services as early as possible but no later than end-2002.
- **Privatization**: Rom Telecom will be privatized through the sale of 30% of its shares to strategic investor(s) and up to 5% to Rom Telecom employees in 1998.
- **Regulation**: The GIC will be developed as an independent regulatory body for regulating the sector, including responsibility for allocation, management and monitoring of radio frequencies. A regulatory development program will be designed and implemented to enable GIC carry out its mandate efficiently, and the regulatory responsibilities of MOC will be transferred to GIC. The radio frequency allocation practices, including the infrastructure for spectrum management and monitoring will be modernized.

2.16 The proposed Project would provide assistance to design and implement the above reform program, including state-of-the-art systems, services and other assistance to develop GIC into an effective regulatory body for all telecommunications networks and services.

F. Assessment of Government Strategy

2.17 The Government's strategy is consistent with the macro economic program, as well as with the industry trends worldwide and the sectoral needs. The strategy would shift to the private sector the responsibility for financing network development in the sector, thereby relieving the burden on GOR. Through privatization of Rom Telecom, Romania would be able to map itself onto the Global alliances in the arena of telecommunications which would bring modern technologies and management expertise and also enhance the value of Rom Telecom subsequently.

2.18 The Government's policy stance for the overall development of the sector, in particular the liberalization and introduction of competition in basic telecommunications, is enshrined in its agreement with the WTO. The policy matrix and the key commitments are presented in Annex 2. When basic services and infrastructure are liberalized, Romania would have an open network access along the lines of its western European counterparts, which would promote technical and economic efficiency in all telecommunications services. The Government duly recognizes the role and need for an independent regulatory agency for the sector. The approach of the GOR to have this agency deal with both the wireline and wireless sectors meets the developmental requirements in line with the emerging technologies and trends, in addition to avoiding duplications and/or conflicts in regulations. *GOR has confirmed the overall policy framework for the reform of the telecommunications sector, including the time table for liberalization of the various communications services and infrastructure (as agreed with the WTO), and the privatization of Rom Telecom.*

III. THE PROJECT

A. Project Objectives

3.01 The objectives of the proposed Project are: (a) to assist Romania in reforming the telecommunications sector, including privatization of existing public sector telecommunications facilities; (b) to provide the necessary infrastructure to enable GIC to maximize the productive use of the radio frequency spectrum and to improve frequency assignment criteria for further expansion of wireless communications services provision by the private sector; and (c) to support GIC in performing regulatory functions over all networks and services in the telecommunications sector.

B. Project Description

3.02 The proposed Project includes the following::

(a) Non-Lending Services and Advice for *Sector Reform* which involves the design and implementation of an appropriate set of policy, legal and regulatory frameworks for the reform of the telecommunications sector leading to attracting new private investment and privatization of Rom Telecom; and

(b) Lending Services for Technical Assistance for *Regulatory Agency Development* which involves capacity building for the independent regulatory agency for regulation of all networks and services

in the telecommunications sector, including equipment and services for installing a national network for radio frequency spectrum management and monitoring.

The sector reform component will be mainly financed from GOR and EU resources, while some preparation work would be financed from the PHRD grant secured for the Project. The Bank would be involved in reviewing the terms of reference and the outputs of consultants, as well as in advising the Government on the implementation aspects of the reforms.

Detailed Project Description

3.03 **Sector Reform**: The design and implementation of the sector reform component would be carried out as follows.

(a) Policy, Legal and Regulatory Frameworks

Policy Framework: Romania's agreement with the WTO forms the basic policy framework, which will be developed further in a sector policy document focusing on key areas such as industry structure, competition policy, ownership policy, pricing policy, regulatory policy, and the extent to which the existing entity(ies) can participate in various service areas in the future.

Regulatory Framework: will be developed covering technical regulation (quality of service, type approval of equipment, frequency spectrum management) and economic regulation (prices, license fees).

Legal Framework: will be developed further, to provide the legal underpinning for transparent regulation and the chosen policy alternatives.

The policy, legal and regulatory frameworks would be developed to support the harmonization with the EU framework (in line with Romania's EU accession-agreement), the liberalization of the sector as set in the WTO Agreement and privatization of Rom Telecom. Also, MOC has retained ASTEC, a consortium of four European consulting firms, to assist with the development of the regulatory framework, to develop recommendations for harmonization with the EU telecommunications policy and regulatory environment, financed from EU sources (EC Phare). The MOC would recruit additional consultants (management and legal) as needed to assist with the finalization of the sector policy and legal framework and would be financed under the PHRD grant.

(b) Privatization of Rom Telecom

Privatization of Rom Telecom will be realized through the sale of up to 30% of its shares to strategic investor(s) and up to 5% of shares to employees of Rom Telecom in accordance with a sale strategy to be developed with the help of advisors. Privatization advisors (led by Goldman Sachs) have been appointed, whose retainer fee would be financed by GOR and their success fee from privatization proceeds. The Bank has reviewed the terms of reference which are included in Annex 3. The sale transaction is targeted to be completed by end-1998/early-1999. The Bank would be involved in the review of the recommendations of the privatization advisors. In order to ensure timely implementation of the sector reforms, ***GOR has agreed to: (a) periodically review with the Bank the implementation progress of the sector reform program, and take all actions as may become necessary based on such review to ensure implementation of the reforms in a manner satisfactory to the Bank; and (b) review with the Bank, no later than September 30, 1998, the strategy for privatization of Rom Telecom.***

3.04 Regulatory Agency Development This component will focus on GIC's development into a full fledged regulatory body for the telecommunications sector, including modernization of its infrastructure for radio spectrum management and monitoring. A Regulatory Development Program (RDP) will be designed and implemented under the Project, consistent with the overall sector policy framework, and will enshrine the following governing principles:

- a) Independence will define the nature and degree of independence of GIC from both entities which would be regulated and policy makers, including GIC's accountability and reporting obligations;
- b) Structure will define the legal, organizational and administrative arrangements under which GIC will function as an independent body;
- c) Autonomy will define the parameters which ensure both operational autonomy (e.g. appointment of regulators on a transparent basis and set minimum qualification requirements) and financial autonomy (e.g. independence from the national budget and financing of GIC from regulatory services);
- d) Scope will define GIC's purview of regulation as well as the necessary instruments for them (e.g. economic regulation, technical regulation, interconnection regulation, service quality regulation, monopoly operator regulation, promotion of competition, spectrum assignment and licensing, etc.);

The RDP design will also provide a detailed implementation plan including time table, staffing and training plans, transfer of regulatory responsibilities and staff from MOC, restructuring of GIC as appropriate, financial management improvement and reporting, etc. External advisory assistance will comprise: Management Consulting to prepare the RDP and Regulatory Consulting to assist with the implementation of RDP (which could be structured as a twinning arrangement with an experienced telecommunications regulatory agency). In order to ensure timely implementation of the RDP, ***GOR has agreed to review with the Bank, no later than April 30, 1999, a Regulatory Development Program for GIC satisfactory to the Bank, and take all actions necessary to commence implementation, no later than December 31, 1999, of the agreed Regulatory Development Program.*** The terms of reference for the consulting services for RDP design are included in Annex 4.

3.05 As regards modernization of radio frequency monitoring and management policies and procedures, including the associated infrastructure, the detailed strategy is presented in Annex 1, which is summarized below.

- a) National Spectrum Monitoring System (NSMS) Network will be designed and installed, including all required computerized tools for making frequency spectrum allocations, for issuing licenses, and for preventing harmful interference among users of the frequency spectrum. The network will consist of a National Control Center in Bucharest connected to four regional centers - one each in Bucharest, Iasi, Cluj and Timisoara - through a communications network with specialized computer-assisted controls on a LAN/WAN configuration; and
- b) Capacity Building for GIC will focus on adopting modern methods and practices in spectrum management and would include (i) spectrum management & engineering for defining the process, procedures and methodology for formulation and implementation of spectrum use and allocation policies, reallocation of frequency bands, monitoring and enforcement, etc.; and (ii) market oriented methods of licensing for promoting transparency in frequency allocation for users of the scarce spectrum, especially for competitive services.

External advisory assistance will comprise: Project Engineering and Management consultants experienced in all aspects of NSMS to assist with supervision of implementation, and Spectrum Management Consultants to assist with capacity building (could also be an experienced radio frequency administration). *GOR has agreed to review with the Bank, no later than June 30, 2000, policies for radio frequency assignment and licensing methods & fees for competitive services and to commence implementation, no later than September 30, 2000, of the agreed policies in a manner satisfactory to the Bank.*

C. Project Costs

3.06 The total cost of the proposed Project is estimated at US\$ 44.0 million equivalent including physical and price contingencies of about US\$ 4.5 million. Interest during construction (IDC) is not computed separately because the Project largely involves installations of many items of equipment in a phased manner, each of which will be put to use immediately after installation. Project cost estimates are detailed in Annex 5 and summarized in Table 3.1.

Table 3.1: Project Cost Summary, 1998-2002
(US\$ Million)

Description	Local	Foreign	Total	% Foreign Exchange
<u>Sector Reform</u>		1.8	1.8	100
<u>Regulatory Agency Development</u>				
NSMS	3.0	32.8	35.8	92
RDP	0.2	1.0	1.2	83
Capacity Building		0.7	0.7	100
Total Base Costs	3.2	36.3	39.5	92
Physical Contingencies	0.5	2.4	2.9	83
Price Contingencies ^{a/}	0.3	1.3	1.6	79
Total Project costs	4.0	40.0	44.0	91
^{a/} Using International Inflation Index (MUV Index).				

3.07 Direct and indirect foreign exchange costs are estimated at US\$ 40 million (91% of total project cost). The estimates for sector reform are based on actual contract values and allocated values for specific assignments. The estimates for the NSMS are based on consultants' estimates, while the estimates for all other technical assistance are the staff's assessment, based on reviewing/financing similar assignments in other countries. Physical contingencies of 10% have been assumed for the relevant sub-components of the Project. Price contingencies are calculated using international inflation forecasts based on the following expected MUV index as follows: 4.6% in 1998; 3.2% in 1999; 2.9% for 2000; and 2.5% for 2001 and 2002. Since there is no IDC involved, total project costs represent the total financing requirements.

D. Project Financing

3.08 The financing plan for the Project is detailed in Annex 5 and is summarized in Table 3.2. The sector reform would be financed by the EU and GOR. The Bank would finance a major part of the foreign costs associated with the regulatory agency development, while GIC would finance the balance of foreign costs and all local costs.

Table 3.2: Project Financing Plan (1998-2002)
(US\$ Million)

	Local	Foreign	Total	%
GOR/EU	-	1.8	1.8	4
GIC	4.0	8.2	12.2	28
Proposed Bank Loan	-	<u>30.0</u>	<u>30.0</u>	<u>68</u>
Total Financing	4.0	40.0	44.0	100

Proposed Bank Loan

3.09 The proposed Bank Loan amounting to US\$ 30 million will be made to GIC and will represent 68% of total financing requirements. GIC, in consultation with MOF, has elected a Libor-based single currency loan in US Dollars. GIC's rationale for the choice of the terms is based on the fact that a substantial part of its revenues are indexed in US Dollars (the spectrum usage fees by the two GSM operators). The MOF considers the terms suitable from the broader debt management strategy point of view.

3.10 GIC's financial statements for the period 1992-96, estimated for 1997 and projections for the period 1998-2004 are provided in Annex 6. GIC's revenues have exceeded its expenses during the past periods and will far exceed the expenditures in the forecast period. This is mainly due to revenues from operators such as the cellular phones, Rom Telecom, etc., who are required to pay license fees for the use of the spectrum (e.g. each of the two GSM operators pay US\$ 5 million equivalent each year plus US\$ 230,000 equivalent per year for each additional channel to GIC during the next ten years as license fees for the use of the spectrum and for monitoring to ensure non-interference nationwide; Rom Telecom is required to pay US\$ 0.30 per line per year from 1998 towards supervision and regulation). As a result, GIC's revenues which was about US\$ 1.8 million equivalent in 1996 is estimated at about US\$ 11.9 million equivalent in 1997 and is expected to exceed US\$ 16 million from 1998 onwards. Cash flow projections indicate that GIC would be able to meet debt-service on the Loan and finance all local costs and part of the foreign costs as planned. In addition, the introduction of new services will further expand the revenue base of GIC in the future. GIC's finances are thus sound and satisfactory. *Agreements have been reached with GIC to ensure that GIC will generate sufficient revenues, if necessary by increasing the fee for license and other services, to maintain a debt-service cover ratio of not less than 1.5.*

E. Procurement

3.11 Procurement arrangements are summarized in Table 3.3. Procurement of Bank financed goods would be carried out in accordance with the Guidelines: Procurement under IBRD Loans and IDA Credits (January 1995, Revised in January and August 1996, and September 1997 edition). The procurement of NSMS would be under ICB on turnkey basis. The NSMS comprises procurement of computer hardware & software, customized spectrum management and monitoring applications software, fixed & mobile monitoring stations and transportable monitoring units which would all be integrated into a national network. In view of the technical and operational compatibility requirements, the NSMS will be a single-responsibility turnkey contract including the design, supply, installation, testing and commissioning as well as training to GIC staff. The NSMS procurement will be carried out under two-stage bidding process using the Bank's draft standard bidding documents for procurement of information technology (supply and installation, May 1996 edition). All Bank financed procurement would be subject to the Bank's prior review procedures.

Table 3.3: Summary of Procurement Arrangements
(US\$ million) a/

Project Element	Procurement Method		N.B.F. c/	<u>Total</u>
	ICB	Others b/		
<u>A. Sector Reform</u>				
(i) Policy/Legal/Regulatory			0.8	0.8
(ii) Rom Telecom Privatization			1.0	1.0
<u>B. Regulatory Agency Development</u>				
(a) NSMS				
(i) NSMS - Turnkey Contract and Site Development	34.1 (29.0)			34.1 (29.0)
(ii) Electronics Workshop			1.5	1.5
(iii) Regional Laboratories			3.4	3.4
(iv) Project Engineering & Mgmt		1.0 (0.5)		1.0 (0.5)
(b) RDP				
(i) Design		0.25 (0.1)		0.25 (0.1)
(ii) Implementation		1.15 (0.2)		1.15 (0.2)
(c) Capacity Building:				
(i) Spectrum Planning & Eng.		0.7 (0.16)		0.7 (0.16)
(ii) Market Based Licensing		0.1 (0.04)		0.1 (0.04)
Total	34.1 (29.0)	3.2 (1.0)	6.7 (--)	44.0 (30.0)

Note: Figures in parenthesis are the respective amounts financed by the Bank Loan.

a/ Includes contingencies.

b/ According to Banks Guidelines for Selection of Consultants (Jan. 1997).

c/ N.B.F. = Not Bank Financed, principally consisting of GIC financed components of the NSMS and equipment for electronics workshop and laboratories.

3.12 The Bank financed consultancy services are all under the regulatory agency development component and procurement of these services would be in accordance with Bank Guidelines for Selection of Consultants (January 1997, revised in September 1997, edition). The Project Engineering and Management (PEM) consultancy services involves specialized engineering assistance to support supervision of implementation of NSMS and is estimated to cost about US\$1.0 million equivalent for a total of about fifty person-month effort over a three year time period. The PEM will provide one resident manager during the entire implementation period of NSMS and additional experts to cover all aspects of NSMS as it progresses. Quality- and Cost-Based Selection (QCBS) process as per Bank guidelines would be adopted. The design of RDP involves management consultants with an estimated cost of about US\$ 0.25 million for 10-12 person-month effort over a six-month duration. The implementation of RDP involves specialized regulatory consultants to deal with regulatory aspects and financial/management consultants to assist with institutional and financial management improvement aspects. The services for regulatory assistance would be provided by a telecommunications regulatory agency and is estimated to involve about fifty person-months of effort over a two year time period at a cost of about US\$ 1.15 million. The method

of selection of consultants would be QCBS. The possibility of a twinning arrangement for these services would be examined. The Spectrum Planning & Engineering services involve consultancy support from an experienced spectrum administration for adopting modern procedures and methods in spectrum management and monitoring, and is estimated to cost about US\$ 0.7 million with about thirty-five person-month of effort over a two year time period. The method of selection of consultants would be QCBS. The Market Based Licensing involves specialized economic consulting of about 3-4 person-month of effort to examine and recommend appropriate methods of licensing for Romania. The selection of consultants would be based on the least-cost selection method as per Bank guidelines. Procurement of all Bank-financed consultancy services above US\$ 100,000 equivalent for firms would be subject to prior review procedures as per Bank guidelines. With respect to each contract for employment of individual consultants estimated to cost the equivalent of US\$ 50,000 or more, the qualifications, experience, terms of reference and the terms of employment of the consultants would be furnished to the Bank for its prior review and approval.

F. Disbursement

3.13 The Bank funds would be disbursed against: (a) 85% of the cost of the supply of goods, associated works and services with respect to turnkey contracts procured under ICB; (b) 50% of the cost for project management and engineering support consultancy services; and (c) 40% of the cost for other consultancy services for capacity building and training. Expenditures amounting to a maximum of 10% of the Loan amount which could be incurred after January 1, 1998 but prior to loan signature towards eligible expenditures contracted under Bank procurement guidelines, would be eligible for retroactive financing. The Loan closing date would be December 31, 2002. Detailed disbursement schedule for the Bank loan is provided in Annex 5 and is summarized in Table 3.4.

Table 3.4: Disbursement Schedule

Bank FY	FY99	FY00	FY01	FY02
Annual	9.00	14.16	5.59	1.25
Cumulative	9.00	23.16	28.75	30.00

3.14 To facilitate the implementation of the Project, the GIC will open and maintain a Special Account with a commercial bank in Romania on terms and conditions acceptable to the Bank. The authorized allocation of the special account would be (US\$ 1 million). At the start of the project, the special account deposit will be limited to (US\$ 0.5 million) and the remaining portion of the authorized allocation could be requested only after cumulative disbursements reach a level of (US\$ 3 million). Withdrawal applications for the replenishment of the special account should be sent to the Bank on a quarterly basis, or when the balance of the special account is equal to about half of the initial deposit or the authorized allocation, whichever comes first. These applications would have to be supported by appropriate supporting documentation including a copy of the monthly bank statement of the special account as well as its reconciliation with the special account transactions.

3.15 GIC has about 21 staff, five in management positions, involved in finance and accounting aspects, of which ten have university degrees in economics and the rest have a high school diploma in economics. The economic directorate supervises all financial aspects of GIC and has three departments - one each for budget & accounting, administration and wages. GIC's accounting is based on Romanian Accounting Standards which are applicable to all regies in Romania. GIC's main accounting transactions involve salary administration and license fees collections. The proposed Project would substantially enlarge the asset base of GIC. Also, as a prospective and independent regulatory body, GIC would need to have appropriate

reporting in order to project transparency, adopt independent audit and improve financial management as necessary. GIC is in the process of appointing auditors to audit GIC's 1996 and 1997 financial accounts as well as define a financial management improvement plan which will be implemented under the RDP (para 3.04). *GIC has agreed to have the financial accounts, project accounts, special account and statement of expenditures audited by independent auditors and submit the audit report to the Bank within six months after the end of the fiscal year.*

G. Project Implementation

3.16 MOC would be responsible for implementing the sector reforms, which have direct impact on GIC's responsibility for implementing the RDP component of the Project. The privatization of Rom Telecom under an appropriate policy, legal and regulatory frameworks would be achieved by end-1998/early 1999. The implementation of further reforms to introduce competition and expand private sector participation will proceed in accordance with the sectoral reform program. A Steering Committee, chaired by the Minister of Communications and comprising representatives from the Ministry of Finance, Ministry of Justice and Ministry of Economic Reforms has been formed to oversee the sector reforms, especially the privatization of Rom Telecom. *GOR has agreed to review with the Bank, no later than September 30, 2000, a report summarizing the status of implementation of the reform program, and take all agreed measures for achievement of the objectives of the Project.*

3.17 The institutional development of GIC to enable it carry out the regulatory oversight of the sector will occur in a gradual fashion per the RDP and would be closely aligned with the sectoral reform program. The implementation of the NSMS will be achieved through one turnkey contract, including design, supply, installation and related services. The commissioning of new monitoring facilities will occur at the four regional centers in a phased manner over three years beginning in FY99. The tender documents for the procurement of NSMS have been approved by the Bank and the contract signature is expected by end-July 1998. A detailed implementation plan is presented in Annex 1. *GIC has agreed to review with the Bank, no later than September 30, 2000, a report summarizing the status of implementation of the NSMS and RDP, and take all agreed measures for achievement of the objectives of the Project. The recruitment of consultants for project management and supervision is set as a condition of effectiveness of the proposed Loan.*

H. Project Monitoring and Bank Supervision

3.18 To help the Bank monitor project implementation, GIC will be asked to furnish Quarterly Progress Reports and Annual Audit reports, whose format and content would be satisfactory to the Bank. Project accounts, to reflect all project resources, expenditures, assets and liabilities, will be maintained in accordance with generally accepted accounting principles. These accounts, along with the Special Account and financial accounts, would be audited annually by independent auditors acceptable to the Bank. The audit reports would be submitted to the Bank no later than six months after the end of each fiscal year. As regards supervision, it would be staff intensive for the first year, requiring 3 missions (as compared to the normal 2 missions), due to the privatization of Rom Telecom and the related sector policy aspects, and also because GIC is new borrower requiring to become familiar with Bank requirements. The Bank's Resident Mission in Romania, which has been fully involved with project preparation, will continue to play a major role in project supervision. A proposed supervision plan is provided in Annex 7.

I. Environmental Aspects

3.19 The project components will not raise environmental issues since most development can be accommodated at existing sites. The regional frequency management centers would be accommodated within the existing sites. The project does not have any measurable adverse environmental impact and fits in a Category C for the purposes of Environmental Assessment. Nevertheless, during project supervision, the Bank will ensure that the physical components of the NSMS are being implemented in an environmentally prudent manner. In fact, the proposed Project is expected to have significant environmental benefits, as more efficient use of telecommunications will substitute for personal transportation and correspondingly reduce environmental pollution and promote energy conservation.

IV. PROJECT JUSTIFICATION

A. Market Analyses

4.01 Telecommunications is a profitable business worldwide. Not only have countries which have chosen to maintain state ownership and monopolistic control of their national telecommunications operations always been able to reap high profits from such operations, those that have decided to liberalize their entire sector operations have seen their sectors and the economy prosper to a far greater extent. Reform and liberalization of the sector in Romania, including the privatization of Rom Telecom, is essential in order to ensure that Romania is able to stay abreast of technological development and its industry is not hampered in its competitive capacity. Romania is positioned well geographically to serve as an important routing conduit for traffic flows. Further, (a) investor interest already exists, both domestically and internationally, for Rom Telecom; (b) the relatively flush financial position of foreign telecommunications operators potentially interested in becoming investors; and (c) the crucial importance currently being attached to the forming of strategic alliances in the global telecommunications industry. As a consequence of these factors, prospects for the realization of Rom Telecom privatization and hence in the growth of services are very high.

4.02 As for the demand for spectrum use, existing over-the-air services will continue to grow, thereby intensifying the spectrum problems now plaguing Romania unless the proposed NSMS facilities and associated procedures are implemented. However, this looming disaster can be turned into real opportunities for economic growth by installing the NSMS, which will help in accommodating various demand elements. These include, for example: (a) the added demand for spectrum use directly resulting from carrying out telecommunications sector reform and from newer services (e.g., PCS); and (b) the longer-range demand impact of privatizing Rom Telecom, the single largest spectrum user within Romania.

B. Project Benefits

4.03 Expanding Romania's telecommunications sector to private investment through reform will have a number of financial and economic benefits. The financial benefits accrue to GOR, Rom Telecom and to private operators. The financial benefits are: (a) private capital infusion into Rom Telecom; (b) incremental revenues through annual spectrum usage fee from expanded and improved use of the spectrum; (c) revenues to GOR that accrue through the award of licenses to operators for new spectrum based services (e.g. the recent GSM license award fetched GOR US\$ 100 million); and (d) revenue benefits to private operators. There are also economy-wide benefits which cannot be quantified. These include: (a) the inflow of private investment with the attendant increase in consumer choice, improved service quality and greater competition with real tariff reductions; (b) expansion of the sector, growth in employment opportunities and growth in the size of the telecommunications markets; (c) achieve more efficient use of Romania's radio spectrum resources, which will bring about technological advances especially in the areas of wireless

services and broadcasting; and (d) support the macro stabilization program. The Project would enable Romania to enlist in the global alliances in telecommunications and thus take advantage of the revolution in communication and information exchange. The Project would also demonstrate a successful liberalization model for emulation by state economic enterprises beyond the telecommunications sector.

C. Project Risks

4.04 The proposed Project faces three types of risks. Policy risks may entail derailment and/or reversal of sector reforms. This risk is small because the Government is pro-market and has strong support for undertaking reforms. Romania's successful reforms in liberalizing the advanced telecommunications services sector, the passage of the new Telecommunications Act in 1996 and the agreements made with the WTO concerning liberalization attest to the commitment of the successive governments to the reforms in this sector, and the current GOR is even more committed to broadening and deepening the reforms. Also, Romania's desire to join the EU, demand from private sector and the general public for more efficient and expanded access, the sweeping and successful reforms taking place in this sector in all countries, including in Eastern Europe, should provide further impetus to implement the reforms. Implementation risks resulting in delays in implementation of NSMS are mitigated by the fact that there would be only one turnkey contract which will include supply & installation, and that project management consultants would be recruited before effectiveness. As regards market risks, telecommunications is a growing and profitable sector and has attracted investor interest worldwide. The growth potential of this sector in Romania makes it an attractive investment to many telecommunications companies which have substantial resources for investing in foreign telcos.

V. SUMMARY OF AGREEMENTS REACHED AND RECOMMENDATION

5.01 During negotiations, GOR confirmed the overall policy framework for the reform of the telecommunications sector, including the time table for liberalization of the various communications services and infrastructure (as agreed with the WTO) and privatization of Rom Telecom (para 2.18).

Agreements

5.02 During negotiations, GOR agreed to:

- (a) periodically review with the Bank the implementation progress of the sector reform program, and take all actions as may become necessary based on such review to ensure implementation of the reforms in a manner satisfactory to the Bank (para 3.03);
- (b) review with the Bank, no later than September 30, 1998, the strategy for privatization of Rom Telecom (para 3.03);
- (c) review with the Bank, no later than April 30, 1999, a Regulatory Development Program for GIC based on principles agreed with the Bank, and take all actions necessary to commence implementation, no later than December 31, 1999, of the agreed Regulatory Development Program (para 3.04);
- (d) review with the Bank, no later than June 30, 2000, policies for radio frequency assignment and licensing methods & fees for competitive services and to commence implementation, no later than September 30, 2000, of the agreed policies in a manner satisfactory to the Bank (para 3.05); and

(e) review with the Bank, no later than September 30, 2000, a report summarizing the status of implementation of the reform program, and take all agreed measures for achievement of the objectives of the Project (para 3.17).

5.03 During negotiations, GIC agreed to:

(a) ensure that it will generate sufficient revenues, if necessary by increasing the fee for license and other services, to maintain a debt-service cover ratio of not less than 1.5 (para 3.10);

(b) have the financial accounts, project accounts, special account and statement of expenditures audited by independent auditors and submit the audit report to the Bank within six months after the end of the fiscal year (para 3.15); and

(c) review with the Bank, no later than September 30, 2000, a report summarizing the status of implementation of the NSMS and RDP, and take all agreed measures for achievement of the objectives of the Project (para 3.17).

Conditions

5.04 The recruitment of consultants for project management and supervision is set as a condition of effectiveness of the proposed Loan (para 3.17).

Recommendation

5.05 On the basis of the above agreements, the proposed Project is suitable for a Bank loan of US\$30 million.

Romania
Telecommunications Reform and Privatization Support Project
National Spectrum Management System
Detailed Project Description

A. The Radio Frequency Spectrum

1. The radio frequency spectrum (the Spectrum) is a resource naturally available in the physical environment. The Spectrum is an intrinsically scarce good, since it is limited at the upper end by the technical capabilities currently available for using these frequencies effectively at a given moment in time. At the present time, the frequencies technically mastered in the laboratory are below the 275 GHz threshold and those exploitable operationally are below 60 GHz (Figure 1). Technical progress will make it possible to increase the quantity of the utilizable spectrum by constantly raising the upper limit of the exploitable resource, however the higher frequencies are useable only over very short distances, so the most popular frequencies will remain the lower frequencies that are currently intensively used. The frequencies between 9 kHz and 275 GHz are the only ones to have been assigned to date for specific uses.

Figure 1 - The Limits of the Radio Spectrum

RADIO SPECTRUM	FREQUENCY RANGE	UTILIZATION
	9 kHz	Operationally exploitable
	60 GHz	Technically exploitable in future
	275 GHz	Potential additional resource
	3,000 GHz	

The usable part of the spectrum is further divided into various frequency bands, and Box 1 provides the commonly used nomenclature of the usable part of radio frequency spectrum.

Box 1- Radio Frequency Nomenclature	
Frequency Range	Band
9 kHz to 30 kHz ----->	Very Low Frequency (VLF)
30 kHz to 300 kHz ----->	Low Frequency (LF)
300 kHz to 3 MHz ----->	Medium Frequency (MF)
3 MHz to 30 MHz ----->	High Frequency (HF)
30 MHz to 300 MHz ----->	Very High Frequency (VHF)
300 MHz to 3 GHz ----->	Ultra High Frequency (UHF)
3 GHz to 30 GHz ----->	Super High Frequency (SHF)
30 GHz and above ----->	Extremely High Frequency (EHF)

Through international agreements at the International Telecommunications Union (ITU), a United Nations organ headquartered in Geneva, these bands are further allocated into smaller bands for specific types of radio communications services. Despite the available capacity, when improperly managed, the ability of the radio frequency spectrum to sustain necessary radio communications services can be significantly compromised by a multitude of natural and man-made phenomena. Factors that influence the Spectrum, and which must be taken into account in deciding how the spectrum might best meet communications needs are shown in Box 2. Therefore, the spectrum needs to be "managed" to ensure that the use of this natural resource for optimum economic and social benefit of the country.

Box 2	<i>Factors Affecting the Radio Frequency Spectrum</i>
*	geography, and the relative location of neighboring countries
*	topography, from hills and mountains to man-made structures
*	size and location of population concentrations
*	effectiveness of the current domestic and neighboring country(s) spectrum management
*	nature of the demand for the spectrum, including the pace of development for new services
*	harmful radio interference from other transmitting equipment
*	government awareness and support for telecommunications development policies and plans
*	cooperation of telecommunications service providers and users

Spectrum Management

2. The modalities and activities involved with *spectrum management* can be grouped into three broad functions namely, Planning, Licensing and Compliance functions.

The *planning function* includes policy formulation to develop an appropriate framework with rules and regulations, to manage existing applications effectively, enable new applications and foster new activity to provide the services. The planning function also ensures awareness of new and growing needs of spectrum use and of the increasing capabilities of technological change to meet these spectrum use requirements, while offering opportunities for new services. This requires extensive, continuing consultations not only with in-country users and providers, but also with other nations of the world, given the nature of the Spectrum.

The *licensing function* enables coordination and regulation of existing and new users of the Spectrum to minimize interference while maximizing the ability of the Spectrum to meet demand. This includes finding necessary frequencies through monitoring and electromagnetic compatibility analysis (EMC), issuing licenses and collecting fees for the use of the radio frequency spectrum. It also includes examining equipment operators where necessary and issuing certificates to ensure good utilization practices. Lastly, it includes testing and type approval of radio equipment to be used, with a view towards international standardization.

The *compliance function* is aimed at ensuring that the policies and regulations that govern effective spectrum utilization are observed so that users and providers can be assured that their communications systems operate properly, at acceptable costs. Compliance includes consultative and educational programs to promote desired spectrum behavior, monitoring to detect spectrum problems, responding to interference complaints and applying sanctions to those who refuse to install, maintain or use their radio communications systems appropriately in accordance with rules and regulations.

The ITU Handbook on National Spectrum Management, Geneva, 1995, provides a more detailed description of national spectrum management.

Spectrum Monitoring

3. Once the spectrum resource is allocated to a particular use and licensed to service provider(s), it is necessary to ensure that there is no interference with such use by other licensed or unauthorized radio emissions. Therefore it is necessary to carry out preventive detection and take corrective action when any of the radio signals depart from the conditions of license. This is done by spectrum monitoring. Interference cannot be eliminated, but it can be managed to keep its impact within technically and economically accepted boundaries. The process is complex and requires a substantial amount of discipline as well as appropriate tools and equipment, which basically comprise electronic devices and software. To carry out *spectrum monitoring*, a number of monitoring stations - fixed, mobile and portable - are necessary. The fixed stations are located in and around major metropolitan centers which invariably are also the areas of maximum use of radio frequencies (ex: wireless telecommunications, airports, taxis, ambulances, radio and TV broadcasts etc.). The mobile and portable stations are used in the more rural areas to supplement fixed station coverage in each region. The spectrum monitoring system is also used to measure the current occupancy of the Spectrum throughout the country to provide needed data for analysis by the planning and licensing groups doing spectrum management. The ITU Handbook on Spectrum Monitoring, Geneva, 1995, provides a detailed description of spectrum monitoring.

Financing Spectrum Management and Monitoring

4. The increase in the number of users, especially the private sector, has enabled most spectrum regulation agencies around the world to finance their activities from the fees charged. Typically the fees include charges for application, spectrum usage, equipment license issue, construction permit issue and import permit issue. Spectrum usage fees account for the major part of revenues (over 70%). Traditionally, fees charged have been based on covering the administrative cost of spectrum management and monitoring, and most countries still use this approach. In view of the utility of the services to the public at large, and the economic benefits associated with them, this simple approach to license issue and fee has continued and licenses are issued on a first-come, first-served basis. This has also helped countries to promote spectrum based services, as is the case with Romania. A comparison of Romania's license fees with a select few countries are provided in Table 1.

Table 1: Fee Comparisons for Mobile License a/
(In US Dollars)

Country	Fee	Total Revenue	GDP per Capita	Normalized Revenue b/
Romania	625	764,000	3,000	255
USA	320	46,000,000	26,000	1,769
Canada	1,409	89,000,000	22,500	3,995
Australia	1,883	61,300,000	20,491	2,991

a/: Typical annual fee for a repeater with fifty subscribers (1995 data)

b/: Factor of total revenue divided by GDP per capita

5. The above comparison shows that typical fees vary considerably among countries, and Romania's is nearly double that in the USA. Also, it shows that increase in revenue from spectrum usage in Romania should come more from expanding the user base than from increasing the fees to existing users. Therefore, Romania should adopt policies that would result in the availability of a larger portion of the spectrum for commercial use, e.g. expanded cellular service and PCS, which have the capability of generating large revenues from the use of the spectrum. Also, fees should be based on the amount and commercial value of the spectrum used and promote efficient use of the spectrum. Romania has already embarked on such an approach with the GSM mobile telephone service, where two licenses were issued (in December 1996) on a competitive bidding basis (which fetched GOR US\$ 50 million for each license). The annual spectrum

usage fee revenue to the GIC includes a fixed annual fee (US\$ 5 million equivalent each from the two GSM operators) for an initial allocation of 22 channels each, plus a fixed annual fee (US\$ 230,000 equivalent) for each additional channel when requested by an operator (for capacity and/or coverage) and authorized by GIC. The future issue of licenses for PCS, MMDS, etc., could provide larger revenues if appropriate actions for proper spectrum monitoring and management are taken. Methods of spectrum allocation which would benefit Romania should be examined, including auctions, lottery, etc.

6. The proposed Project would provide all technical assistance, including installation of a modern NSMS in Romania, to enable effective use of the system and adopt modern approaches to spectrum management and monitoring.

B. Spectrum Management in Romania - The Institutional Framework

7. The Ministry of Communications (MOC) bears the overall responsibility for sector policy and regulation of telecommunications, including the radio frequency spectrum. The General Inspectorate of Communications (GIC) (formerly the General Inspectorate of Radio communications) is a *regie autonome* created under Law 15/1990. The GIC pays taxes under the Commercial Code as a *regie autonome* and is required by the MOC and Ministry of Finance to be self-financing and operate within an approved annual budget. The Telecommunication Law 74/1996 also provides for the MOC to delegate additional regulatory authority for both the wireless and wireline telecommunications (except basic policy and issuing network operator and broadcasting licenses) to the GIC.

Ministry of Communications (MOC)

8. Functions: The MOC is the legal authority responsible for regulation of use of the radio frequency spectrum in Romania and is the signatory for Romania of agreements at the ITU and other international bodies that involve international cooperation in radio communications facilities (such as Intelsat and Inmarsat). The MOC also coordinates allocation of certain frequency bands in Romania for government use by the Ministry of Defense and the Special Telecommunications Service and delegates the technical regulation of the non-governmental frequency bands to the GIC. As provided for in the Telecommunication Law 74/1996, the MOC intends to delegate additional powers and responsibilities to the GIC in accordance with Government Decision number 153/1997, but will retain the following relating to the spectrum:-

- represent Romania at the ITU and other international organizations, conferences and fora and at the meetings with foreign administrations concerning the allocation, usage and management of the spectrum
- conclude international bilateral and multilateral agreements on behalf of Romania in the radio communications sector
- coordinate the allocation policies of spectrum allocations for both civil and governmental needs
- approve updates to the National Table of Frequency Allocations and the List of Tariffs
- policy with respect to issuing regulations and network operator licenses and technical aspects of broadcasting licenses in accordance with applicable laws
- approve the short, medium and long-term policies and planned proposed by the GIC

9. Organization: The organization of the MOC is shown in Attachment. There are currently 53 persons in the MOC staff. The Minister of Communications has two Secretaries of State. One manages the regulatory operations of the Ministry and the other manages development of policies and finances. The Minister also has a politically-oriented staff reporting directly which includes counselors and functional groups for international relations, financial control and legal. The Secretary of State for

regulatory operations has three functional directorates - European Integration, International Organizations and Post Licenses and Regulations; Radiocommunications Licenses and Regulations; Telecommunications Licenses and Regulations - plus administration support staff and a Special Problems Group. The Secretary of State for Development Strategy and Finance has a Strategy of Development Department with three functional directorates - Strategy Development and Telecommunications Quality, Technology Strategy and Industry Relations, and International Cooperation. This Secretary of State also has the Economics Directorate which has three functional Departments - Financial Services, Economic Analysis and Policy, and Human Resources.

General Inspectorate of Communications (GIC)

10. **Functions:** The GIC is responsible for technical regulation of the utilization of the radio frequency spectrum for non-governmental users. Non-governmental users include all private sector users as well as Rom Telecom, Rom Radiocom, other telecommunication service providers and major state-owned utilities. This mandate is planned to be expanded in accordance with Government Decision number 153/1997 to include technical regulation of wireline equipment, which will be necessary with the privatization of Rom Telecom, to ensure that both wireless and wireline telephone equipment meets Romanian (normally ETSI) technical standards.

The GIC is specifically responsible for the following:

- preparation of policies and plans for spectrum utilization for approval by MOC
- liaison with the public and government agencies and Ministries regarding radiocommunication technical issues
- maintaining a national register of frequency assignments for non-governmental stations
- receiving and accepting or rejecting applications for frequency assignments from all non-governmental users
- issuing Permits to applicants to purchase approved radio equipment and install it at stipulated sites
- inspecting radio station installations and issuing Authorizations to operate the station
- receiving and resolving radio interference complaints
- conducting examinations of radio operators and issuing Operator Permits
- monitoring the use of the spectrum
- enforcement of the Regulations, Permits and Authorizations
- preparation of operational guidelines for use by GIC staff
- issuing invoices for fees payable for Permits and Authorizations and receiving payments
- liaison with adjacent countries regarding cross-border interference
- liaison with adjacent countries regarding cooperation in international monitoring tasks.

11. **Organization:** The GIC is organized into a Headquarters in Bucharest plus four Regions - Bucharest, Cluj, Iasi and Timisoara. The GIC Organization Chart is shown in Attachment. The Administrative Board is chaired by the Director General of the GIC and consists of representatives from the Ministries of Communications, Finance, Defense and the STS. This Board functions as the Board of Directors for the GIC. The Managing Committee consists of the Director General of the GIC, the Deputy Director General and the Technical and Financial Directors and key Managers and deals with the operational activities of the GIC. The GIC currently have a staff of 250, 70 at Headquarters and 180 in the Regions.

Other Agencies Involved

13. Interministerial Radio Advisory Commission (IRAC): The IRAC consists of representatives from MOC, GIC, the Special Telecommunications Service (STS) and the Ministry of Defense (MOD). The MOC representative chairs the Meetings of IRAC, which occur about once a month. The IRAC provides advice to the Minister of Communications on policy issues and also serves as a forum for coordination of technical issues between the GIC, STS, and MOD. Unfortunately this committee has not been effective in developing pragmatic plans for transition from the present frequency allocations to the EU and NATO allocations or in freeing up some of the present government bands for non-government use, primarily due to lack of funding for these purposes by the MOD.

14. Special Telecommunication Service (STS): The Special Telecommunications Service (STS) is a government agency directly responsible to the Supreme Council of National Defense and provides telecommunications facilities and services to governmental departments at the Ministerial level and to the security services. The STS utilizes the spectrum allocated for government use for radio communications in coordination with the MOD and also utilizes the shared government/non-government allocations in coordination with the GIC and MOD. The STS operates a national network of fixed and mobile radiocommunication facilities and continues to upgrade and expand these facilities and services to meet government requirements. The STS has some spectrum monitoring facilities, primarily in the HF bands, for spectrum control purposes, but the equipment is old and not very effective.

15. Ministry of Defense (MOD): The MOD has an extensive existing network of radiocommunication facilities for their own use. The MOD is also upgrading and expanding these facilities on a continuing basis when funding permits. The MOD intends to harmonize with the frequency guidelines of NATO and the EU.

C. Spectrum Management Issues in Romania

17. Radiocommunications services within Romania are generally organized and allotted along established ITU rules; however, there are some unique differences. In the past, these services were aligned closely with the Russian and Warsaw Pact structure for civilian and military uses, thereby essentially meeting the requirements of the GOR. A legacy of this frequency allocation structure is that the military use a larger proportion of the Spectrum than in NATO countries and the military also use frequencies in nearly all frequency bands, rather than being concentrated in specific bands. With the continuing privatization of telecommunication system and services, and the increasing needs of the public sector, the spectrum based services are undergoing a dramatic change towards meeting the needs of the country as a whole. The use of the spectrum is growing in all countries from 5 to 15 percent a year, and is projected to grow at a faster rate as the use of cellular telephony, PCS, digital satellite broadcasting, etc., increases. Romania's plans to gain entry to the European Union and NATO necessitate a fundamental change to the allocation of the Spectrum to civilian and military uses, which will be technically complex, difficult to implement and expensive. Further, the wireless based local access networks (Wireless Local Loops) which are under trial now are expected to be deployed widely for basic service. The WLL are increasingly being used in high population countries with low penetration rates (number of telephone lines per 100 population).

18. The current use of the spectrum (excluding military) for fixed, mobile and broadcasting services in Romania is summarized below.

- *Fixed services* include aeronautical, meteorological, maritime, geological, etc., and rely on high frequency bands (2 to 40 GHz). Some bands are crowded (e.g. 13 GHz band) and spectrum utilization in all fixed bands needs to be encouraged through proper allocation and management. Also, the microwave systems operating below 3 GHz should be gradually freed-

up for land mobile services (telecommunications such as the PCS and mobile satellite services) which have high commercial value. Also, sufficient spectrum should be allocated for multichannel, multipoint video distribution services (MMDS). MMDS is an easy, low-cost means to provide broadcasting service.

- *Mobile services* include paging, private networks (including public safety networks), cellular telephony, etc., and use the 150 MHz, 450 MHz and 900 MHz bands, and account for most of the current spectrum use by the private sector. These are the fastest growing services with a high revenue base. In Romania, as in other countries, availability of enough spectrum to meet the needs of this expanding market is an important concern. There is less than 70 MHz allocated to these systems in Romania at present, while at least twice that would be needed to meet the projected demand.
- *Broadcasting services* include radio and TV. Private radio and TV stations have been authorized following the passage of the Audio Visual Act of 1992. There are approximately 75 private TV and 200 private radio stations in operation, however, they currently operate only on low power, due to interference problems which has limited their coverage. There is also a major transition program required to align the FM Broadcast and TV channels 1 through 5 with EU standards and relocate channels 11 and 12 for the introduction of Terrestrial Digital Audio Broadcast. Cable TV services have about 2 million subscribers in the cities and in some rural areas. MMDS is not yet available in Romania.

19. Through proper spectrum monitoring and management, these issues could be addressed in a satisfactory manner. However, the present network for monitoring the spectrum is old and of outdated technology. The staff need to manually perform monitoring assignments, including occupancy monitoring on individual frequencies, but cannot perform comprehensive occupancy and technical compliance monitoring or location determination of unauthorized or non-compliant stations. This equipment is inadequate for GIC requirements and, in order to ensure efficient utilization of the scarce spectrum resource, modern spectrum management and monitoring tools and techniques would be adopted.

D. The National Spectrum Management System (NSMS) for Romania

NSMS Overview

20. The National Spectrum Management System (NSMS) will involve a computer system with a LAN/WAN data and voice communication network configuration linking a National Control Center in Bucharest with Regional Control Centers in Bucharest, Cluj, Iasi and Timisoara. The computer system will be the host for the Spectrum Management operational database and support the two main application programs, Spectrum Management and Spectrum Monitoring. The remote, automatic monitoring stations will also be connected to the computer system through the communications network and will be controlled from the Regional or National Control Centers. The mobile monitoring stations and transportable monitoring units will also have communications links to the nearest Control Center. Links to GIC offices in the main city in each Judet and to the Electronics Workshop in Bucharest will be included in the computer/communications network. It will also include office automation software required for the other operations and administration functions of the GIC. The general configuration of the System is shown in Attachment, and are briefly summarized below.

GIC Computer System and LAN/WAN Configuration

21. The National Control Center LAN will include dual servers with a large disk capacity to hold the operational database, DTM database, spectrum management and monitoring application programs and office automation programs. The server configuration will include features to safeguard the database

from loss and convenient data backup facilities. Features must also include tools for the System Manager and Database Administrator to effectively and efficiently manage and maintain the entire GIC computer system from the National Control Center. The computer system will provide a Windows-based environment for the spectrum management, spectrum monitoring and office automation applications programs. For customization of the Spectrum Management and Spectrum Monitoring systems application software, the relational database management system (RDBMS) will include:-

- administrative, technical and financial operational data for each permit or authorization
- reference data such as the National Frequency Allocation Table and list of approved radio equipment and antenna systems
- geographic information system (GIS) data consisting of the digitized topographic model (DTM) data available for Romania and the coordination zones in the neighboring countries

The data communications circuits for the WAN data network will be arranged by the GIC, utilizing a leased facilities on the digital fiber optic network from Rom Telecom or local data network operators. Design and implementation of the overall data communications network will require further work, since it involves not only the long distance circuits between remote locations, but also the local loop facilities, which may be unsuitable for the required data transmission rates and reliability required. The Terms of Reference for the Project Management and Engineering consultant includes assistance to the GIC for design, procurement and implementation of the overall data communications network. The scope of supply for the National Spectrum Management System contract includes supply of equipment for the links from the fixed monitoring stations to the PSTN and provision of interfaces with the GSM cellular networks for the fixed, mobile and transportable systems. It is desirable for the communications network to utilize local facilities and supply as much as possible for on-going maintenance and support services.

Spectrum Management System

22. The spectrum management system will consist of an integrated suite of application software programs that will assist and, to a certain degree, automate the spectrum management process for the GIC. It is important to understand that the spectrum management system is a tool with many helpful, labor-saving features to assist the GIC staff to utilize their experience to make decisions, but it is not a system that functions automatically without people being involved. The spectrum management system will interact with the data in the database and is heavily dependent on the data being complete and correct for the spectrum management application software to produce reliable results.

Monitoring and Direction-Finding Systems

23. The National Spectrum Monitoring and Direction-Finding (DF) System Network will consist of remotely-controlled fixed monitoring and DF stations, and transportable monitoring units that will cover the 20 to 1,000 MHz range where most of the spectrum control problems occur. For areas that are not covered by these fixed stations and to provide monitoring capability from 100 kHz to 2,700 MHz, mobile stations will be provided. These stations will consist of a van with computer-controlled equipment mounted in racks that can also be configured to perform monitoring on specialized radio communications systems using equipment from the Electronics Workshop. Details about the functions and features are listed in Table 3 and the quantities and locations are summarized in Table 4.

Electronics Workshop

24. The GIC Electronics Workshop will include: (a) general purpose test and measurement instruments that will cover the full range of radio frequencies to be utilized in Romania; (b) metrology

(standards) equipment for electronics and radio signal parameters; and (c) antennas of various types that cover the frequency bands of the test and measurement equipment. This equipment will be utilized to: (a) maintain and calibrate the test and measurement equipment in the laboratory; (b) troubleshoot, maintain and calibrate the monitoring and DF systems; (c) troubleshoot, maintain and calibrate the portable equipment used for station inspections and interference investigations; (d) type approval testing of locally-manufactured radio devices or equipment; and (e) specialized interference investigations or monitoring assignments.

Regional Laboratories

25. The GIC will require additional resources and facilities to monitor and supervise the performance of Rom Telecom and other major service providers. These facilities will include test and measurement equipment for four regional laboratories, one each in Bucharest, Cluj, Iasi and Timisoara. Specific equipment and training requirements will be determined by GIC during implementation of the NSMS.

Table 3: Monitoring Systems Functions and Features

ITEM	MONITORING SYSTEM		
	REMOTE - CONTROLLED	MOBILE	TRANSPORTABLE UNITS
MONITORING			
Frequency Range	20 - 1 000 MHz	100 kHz - 2 700 MHz	20 - 1 000 MHz
Measurements:-			
frequency	Y	Y	Y
field strength	Y	Y	Y
bandwidth	Y	Y	Y
modulation	Y	Y	Y
identification	N	Y	N
spectrum occupancy	Y	Y	Y
Features:-			
scan rate	medium	fast	medium
audio recording	Y	Y	N
video recording	-	Y	-
special systems	-	*	-
GPS & compass	-	Y	-
DIRECTION-FINDING			
Frequency Range	20 - 1 000 MHz	2 - 2,700 MHz	NONE
Accuracy	1 degree	2 degrees	
Features:-			
speed	fast	fast	
graphical plots	Y	Y	
vehicle	N	Step Van	

* Using equipment from the Electronics Workshop

Table 4: National Monitoring System Configuration

Item	Regions				Total Number
	Bucharest	Cluj	Iasi	Timisoara	
National Control Center	1				1
Regional Control Center	1	1	1	1	4
Remote Control Stations	7	7	4	4	22
Mobile Monitoring Stations	2	1	1	1	5
Transportable Units	5	4	3	3	15

Training and Transfer of Technology

26. The GIC staff will be provided with a comprehensive program of training and transfer of technology to be able to efficiently and effectively utilize the new tools for spectrum management and monitoring and also to operate and maintain the new system. The program will consist of formal training courses in the factory and on-site including hands-on experience on: (a) what the new system will do and how to make it do it (basically the same as learning how to use a new computer program); (b) how to use the new system to do the tasks that they are responsible to perform for spectrum management and monitoring (learning to do the job a new way); and (c) where to go or who to ask for help when the system doesn't do what they expect or want it to do. There will also be a program for transfer of technology to the management staff and more senior specialists including participation with the Project Management and Engineering consultant to: (a) participate in the Design Review Meeting; (b) witness factory acceptance tests; (c) participate in the installation and checkout of the stations and the integrated system; and (d) conduct site acceptance tests. In addition, there will be a program of capacity building activities involving additional consultants through the Consultancy Services program described in the following section.

E. Consultancy Services

Project Management and Engineering

27. Project management and engineering consultancy assistance is needed for the following reasons: firstly, this is a first project of its kind (integrating spectrum monitoring and management; and integrating supply with installation and commissioning). Second, the size of the project is very large compared to those handled in the past. Third, the project is highly critical for Romania, and risks could lead to delays and/or suboptimal project implementation. Lastly, a dedicated team of industry experts focusing purely on the project will ensure the success of the project. Therefore, a project management consultant is required to assist in the implementation of NSMS.

Brief Terms of Reference: The project management consultant would assist in the following:

Preparation

review the studies, detailed data, technical and functional specifications, tender documents, and the resulting contract..

Implementation

- preparation of project supervision plan(s); resource requirements; organization plans; communications plans between client/consultant/contractor;
- supervise the contractor according to plan; report on the project progress; report on resources spent versus planned; report on any deviations from plan;
- maintain project accounts in a manner suitable for auditing;
- agree with contractor on any changes to technical design or construction plan which may be due to technological developments or unforeseen design and/or construction constraints; and
- ensure commissioning including making sure that all appropriate technology transfer steps (training of staff; providing operational and maintenance manuals and any computerized testing and diagnostic tools) have been taken properly.

Capacity Building

28. (a) *Spectrum Planning and Engineering* would assist set up the framework in which the productive use of the radio frequency spectrum can be maximized and managed efficiently. The structural framework in which spectrum management is carried out by: the establishment of the process, procedures and the

methodology for the formulation of spectrum use and allocation policies and the technical criteria for coordination and access; elaborating and formally documenting these policies and rules for the current users and applications; the establishment of the process of re-allocations and vacation of frequency bands including engineering and compensation considerations; the examination of the process of enforcement and making recommendations for improvements; carrying out a review of the adequacy of the current provisions for the promulgation of administrative regulations.

Brief Terms of Reference: This sub-task would include:

- review and classify the current usage of the spectrum in Romania based on licensing data; identify the major users of the spectrum, the national choice of the primary and secondary radio services amongst the available international options up to 275 GHz and update the National Frequency Allocation Table;
- conduct a study of the process currently used to amend national allocations and recommend any streamlining together with an agreed procedure;
- establish, in consultation with MOC/GIC and representatives of major users of the spectrum, the specific frequency bands in which policy reviews of spectrum use in Romania are required;
- prepare and assist in the promulgation of standard radio systems plans which establish the RF channeling plans in the currently utilized microwave and mobile bands and thus enable effective coordination and optimization of the use of the spectrum;
- identify those frequency bands where multiple vendors may provide equipment with different technical capabilities and prepare standards documents which establish the minimum technical parameter values in a format that can be easily referred to by the users;
- examine the process to enable the vacation of a frequency band by its current users to permit the introduction of new services. Suggest any policy/procedural/regulatory authority changes that may be necessary to do so;
- review the effectiveness of the current enforcement procedures. Recommend any changes to improve these, like administrative fines, seizures of equipment, etc., together with recommendations for any regulatory actions to establish the appropriate legal basis for the change.

29. (b) *Spectrum Management Operations* assistance would help build the technical and economic skill sets of GIC staff and set up industrial/user consultative groups to "educate" the industry participants regarding spectrum use and compliance requirements.

Brief Terms of Reference: The spectrum management operations assistance sub-task would involve:

- preparation and implementation of technical skills training programs to complement the training to be provided the NSMS contractor;
- preparation and implementation of a training program for enhancing the commercial and economic skills related to spectrum activities;
- undertaking visits to foreign spectrum administrations to understand the interlinkages of technical, managerial and commercial aspects of spectrum activities in practice; and
- establishment of industry consultative groups, comprising policy makers, regulators, operators, service providers, suppliers and consumers, including definition of consultation procedures.

30. (c) *Market-oriented Methods of Licensing:* All wireless telecommunications services need access to the spectrum, as does all over-the-air broadcasting. Thus, any applications of these (like cellular, paging, PCS or radio and TV broadcasting or videotext) in which a service provider offers a commercial service with the expectation of gain makes use of the national resource of the spectrum. However, the demand for telecommunications services has increased sharply as the world enters into the "information age". This has led to congestion in parts of the spectrum most technically suited for the related radio-based services. This in turn has created a "scarcity value". National governments (including USA) have begun to exploit this

scarcity value by resorting to market-oriented methods of licensing, such as auctions. There is a significant scope for Romania to take advantage of the scarcity value of particular bands of the spectrum. This scarcity value will become higher if multiple commercial service providers were enabled to offer heretofore monopolistic services under the influence of liberalization initiatives. However, the process of selection between contenders for access to the spectrum resource has to be seen to be even-handed, while fulfilling over-arching national objectives and be market driven by each contender assessing the value he places on the particular piece of the spectrum. The approach and hence the process is utterly different from the classical one of ``first-come-first-served`` or of comparative hearings. Often it is unique to a given service or application. The consulting assistance will review the process which grants contending potential service providers access to the spectrum and make recommendations for use in the future.

Brief Terms of Reference: The assignment would involve:

- review and examine the existing institutional and legal basis for the grant of radio licenses with and without fees and for setting the level of radio license fees;
- review and report on the methods used in other countries to generate spectrum usage revenues together with an assessment of the pros and cons of first-come-first-served fixed fee based practices, lotteries, tendering, auctions and negotiated bidding;
- identify the radio services and particular commercial applications thereof where a potential exists for the application of market-based approaches to licensing of frequencies to service providers, and recommend which one of the approaches is most suited for each application in Romania;
- based on the demand forecasts made under other studies, assess the probability of location and timing of competition, and compare the demand for spectrum with available spectrum to establish ``scarcity`` or lack thereof. Input this information to the establishment and review of an allocation plan;
- for each of the new approaches to competitive licensing identified as viable in the environment of Romania, elaborate the process to be followed and develop proforma documentation (like expressions of interest, bid formats, etc.).

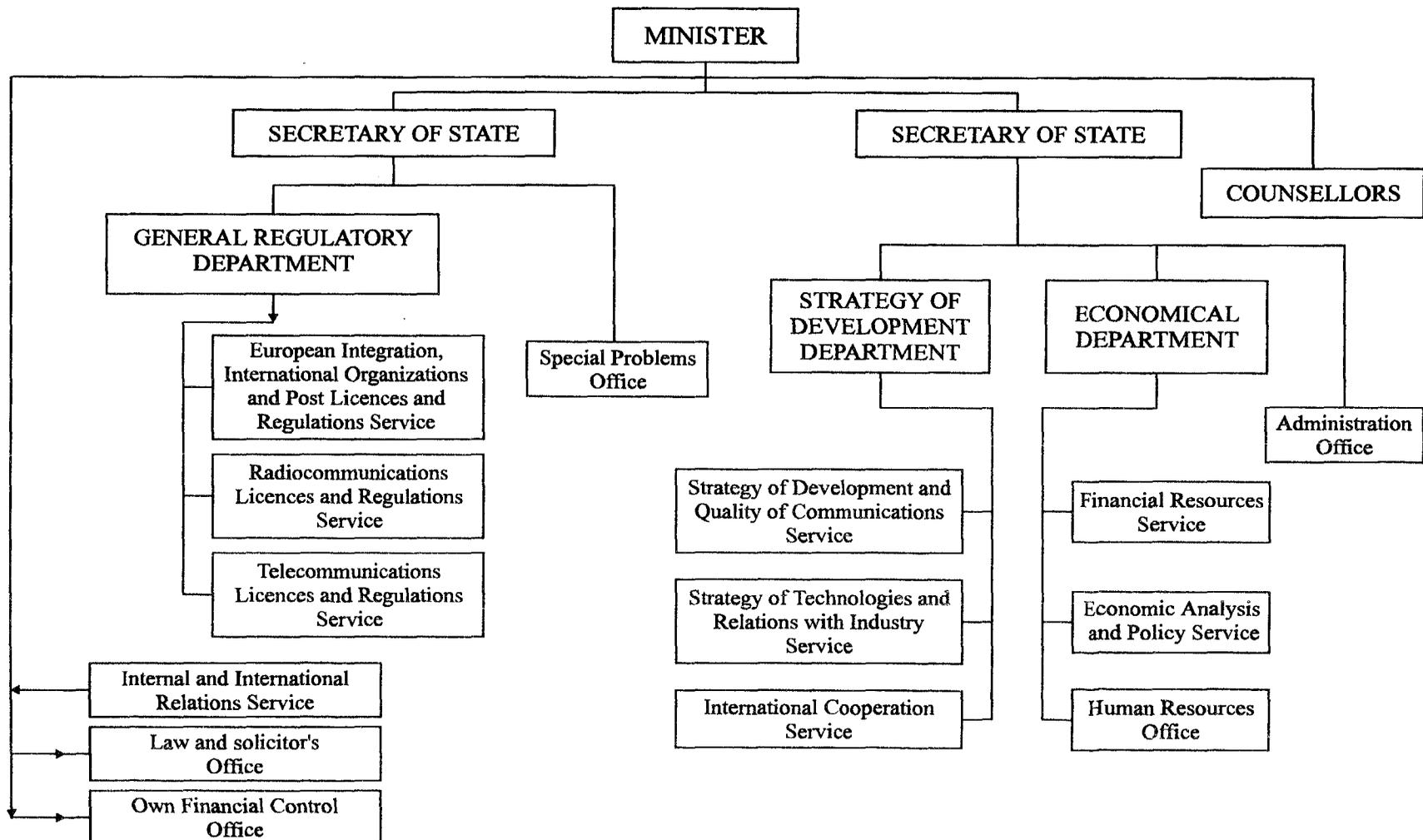
Attachments

1. MOC and GIC Organization Charts
2. Map of GIC Regions in Romania
3. GIC Operational Statistics
4. NSMS Block Diagram
5. NSMS Project Schedule

ROMANIA

Telecommunications Reform and Privatization Support Project

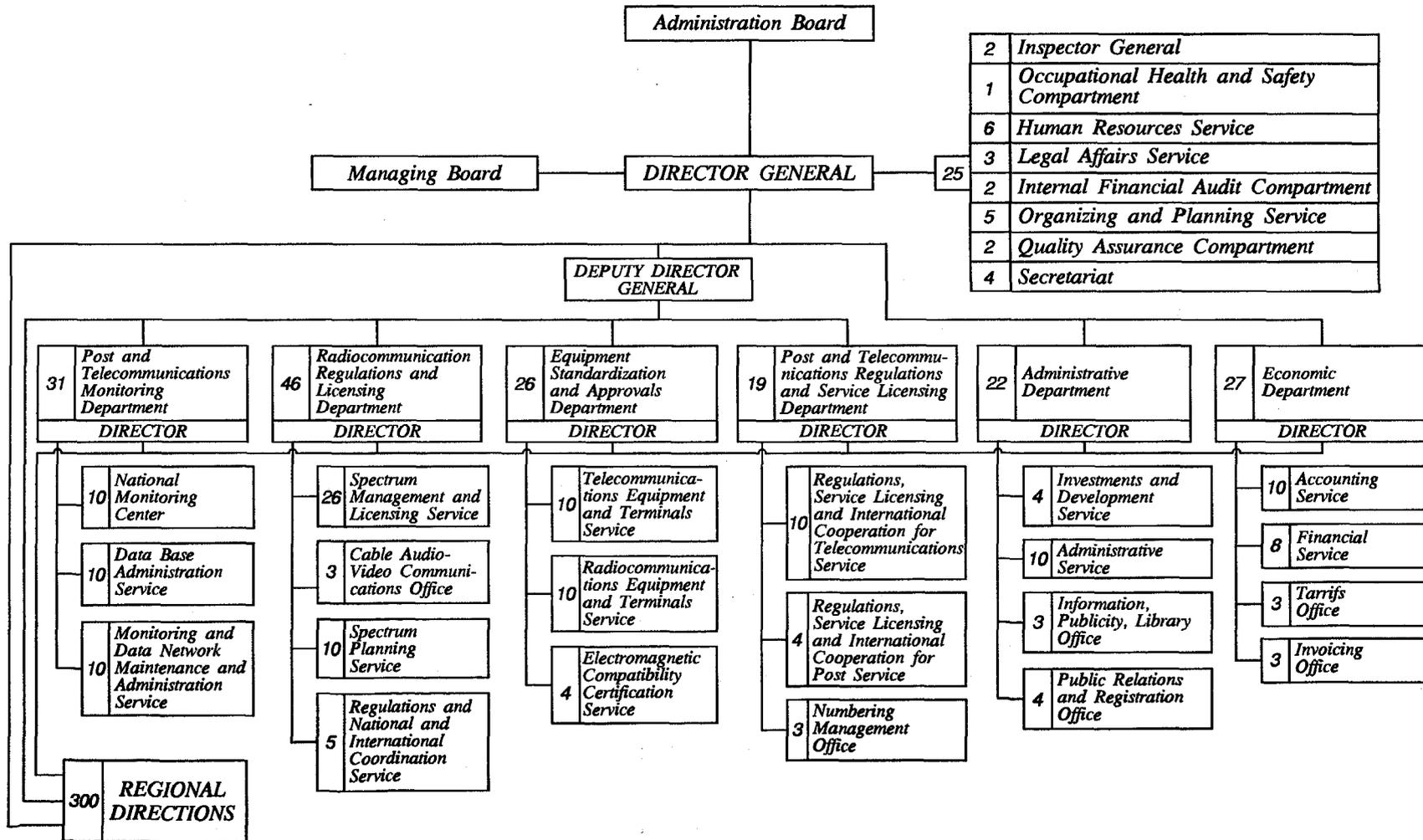
Ministry of Communications Organization Chart



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Telecommunications Reform and Privatization Support Project

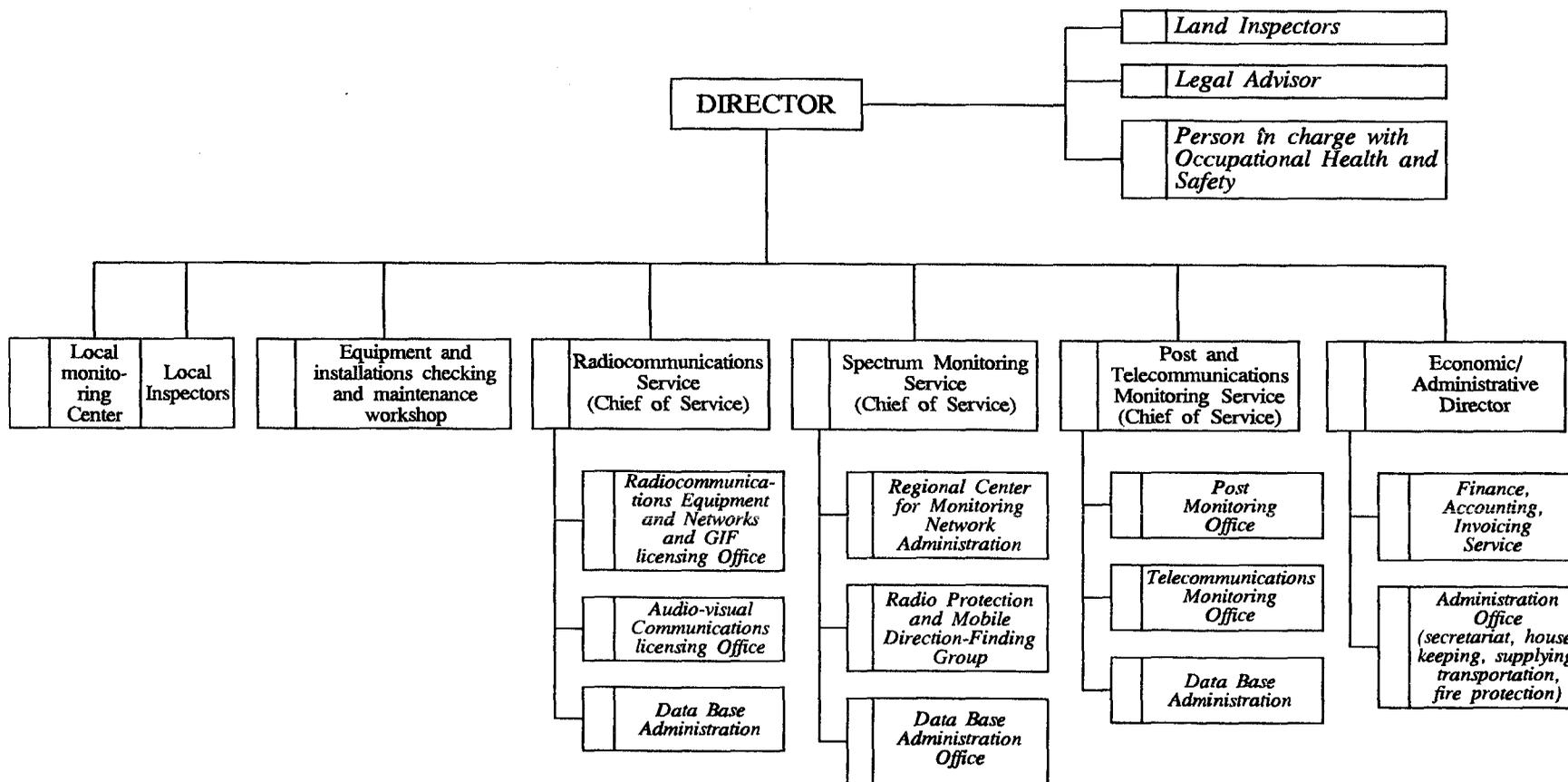
General Inspectorate of Communications Organization Chart



ROMANIA

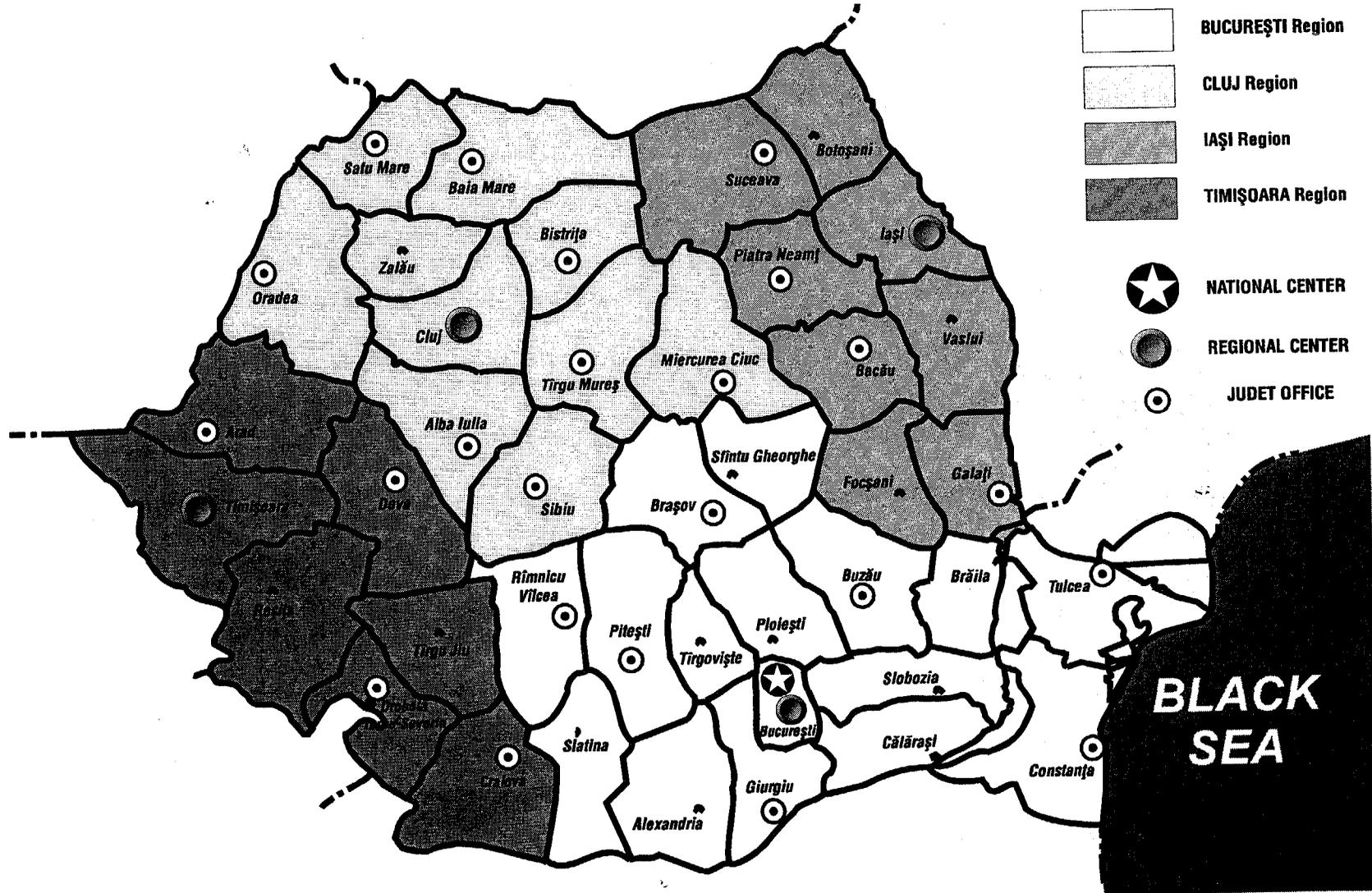
Telecommunications Reform and Privatization Support Project

Regional Direction Organization Chart



Note: Personnel number shall be established in accordance with the quantity and quality of the Regional Direction activity, without overpassing the number provided by the G.I.C. – A.R. organizing chart.

G.I.C. REGIONS



ROMANIA
Telecommunications Reform and Privatization Support Project
General Inspectorate of Communications

Numbers of Radio Equipment in Use

CATEGORY	REGIONS				TOTAL				Avg. Ann. Change 1993/1996
	1993	1994	1995	1996	1993	1994	1995	1996	
1. MOBILE SERVICES									
- Land mobile									
BUCHAREST	28,819	30,493	32,871	39,013					
CLUJ	15,133	15,924	17,698	20,581					
IASI	9,983	10,444	11,805	13,816					
TIMISOARA	10,581	11,010	12,371	14,725					
Sub-total - land mobile	64,516	67,871	74,745	88,135	64,516	67,871	74,745	88,135	11%
- Paging									
BUCHAREST	1,050	3,618	16,172	24,850					
CLUJ	370	1,005	7,775	16,200					
IASI	-	1,206	3,300	11,550					
TIMISOARA	-	-	6,220	12,600					
	1,420	5,829	33,467	65,200	1,420	5,829	33,467	65,200	293%
- Cellular analog network									
BUCHAREST	1,024	3,123	8,173	15,730					
CLUJ	-	-	-	-					
IASI	-	-	-	-					
TIMISOARA	-	-	-	-					
	1,024	3,123	8,173	15,730	1,024	3,123	8,173	15,730	153%
- Maritime - coast and ship stations									
BUCHAREST	539	661	870	958					
CLUJ	-	-	-	-					
IASI	165	204	212	232					
TIMISOARA	23	23	23	23					
	727	888	1105	1213	727	888	1105	1213	19%
- Aeronautical - earth and aircraft stations									
BUCHAREST	208	398	416	440					
CLUJ	41	44	53	53					
IASI	18	20	24	24					
TIMISOARA	4	30	30	32					
	271	492	523	549	271	492	523	549	31%
Sub-total - mobile services					69,648	79,653	119,520	171,040	37%
2. BROADCASTING									
- Radio and TV stations									
BUCHAREST	159	216	224	274					
CLUJ	148	154	158	179					
IASI	134	140	142	153					
TIMISOARA	144	159	177	189					
Sub-total - broadcasting	585	669	701	795	585	669	701	795	11%
3. FIXED SERVICES									
- Radio relay stations									
BUCHAREST	662	802	841	906					
CLUJ	299	383	408	432					
IASI	218	237	241	251					
TIMISOARA	214	294	310	318					
Sub-total - radio relay stations	1,393	1,716	1,800	1,907	1,393	1,716	1,800	1,907	11%
- Earth stations and VSAT									
BUCHAREST	17	36	104	210					
CLUJ	-	1	3	14					
IASI	-	-	1	2					
TIMISOARA	-	-	2	3					
Sub-total - earth stations & VSAT	17	37	110	229	17	37	110	229	141%
Sub-total - fixed services					1,410	1,753	1,910	2,136	15%
TOTAL - All Services					71,643	82,075	122,131	173,971	36%

ROMANIA
Telecommunications Reform and Privatization Support Project
General Inspectorate of Communications
Number of Authorizations and Permits

TYPE	REGIONS				HEADQUARTERS				TOTAL				Avg. Ann. Change 1993/1996	
	1993	1994	1995	1996	1993	1994	1995	1996	1993	1994	1995	1996		
Authorizations for radio stations or networks:-														
- Land Mobile Service					6	-	30	1						
Bucharest	1,544	2,744	2,387	2,886										
Cluj	200	2,240	3,035	2,443										
Iasi	6	505	384	3,866										
Timisoara	128	271	1,689	1,675										
Sub-Total	1,878	5,760	7,495	10,870	6	-	30	1	1,884	5,760	7,525	10,870	94%	
- Broadcasting service	-	-	-	-	211	73	68	49	211	73	68	49	-33%	
- Radio relay service	-	-	-	-	30	218	34	61	30	218	34	61	207%	
- Maritime mobile	-	-	-	-	357	161	213	96	357	161	213	96	-26%	
- Aeronautical mobile	-	-	-	-	31	220	39	69	31	220	39	69	201%	
- Earth stations and VSAT	-	-	-	-	11	28	73	111	11	28	73	111	122%	
- Cable TV networks	-	-	-	-	10	98	194	207	10	98	194	207	328%	
- MMDS networks	-	-	-	-	-	-	1	-	-	-	1	-	-	
SUB-TOTAL	-	-	-	-	656	798	833	594	2,534	6,558	8,057	11,463	75%	
Permits for purchasing radio equipment:-					1,039	1,598	1,708	1,947	1,039	1,598	1,708	1,947	29%	
TOTAL	1,878	5,760	7,495	10,870	1,695	2,396	2,294	2,541	3,873	8,156	9,765	13,411	64%	

Test & Measurement Equipment

Description	Test Eqpt. Type			Qty	Frequency Range	Generation		Operating Mode		
	Fixed	Portable	Hand-portable			1990 or before	after 1990	Manual	Automated	PC Interface
Analog Radio Receiver	x			33	10 kHz - 30 MHz	x		x		
Receiver for Radio-Monitoring	x			1	20 - 1000 MHz		x	x	x	x
Field Strength Meter	x			15	0.15 - 30 MHz	x		x		
	x			8	26 - 300 MHz	x		x		
Miniport DF Receiver			x	8	26 - 1000 MHz		x	x		
RF Power Meter P≤500 W			x	27	26 - 1300 MHz		x	x		
Spectrum Analyzer	x	x		5	0.01 - 1800 MHz		x		x	-x
	x	x		1	20 MHz - 23 GHz		x		x	x

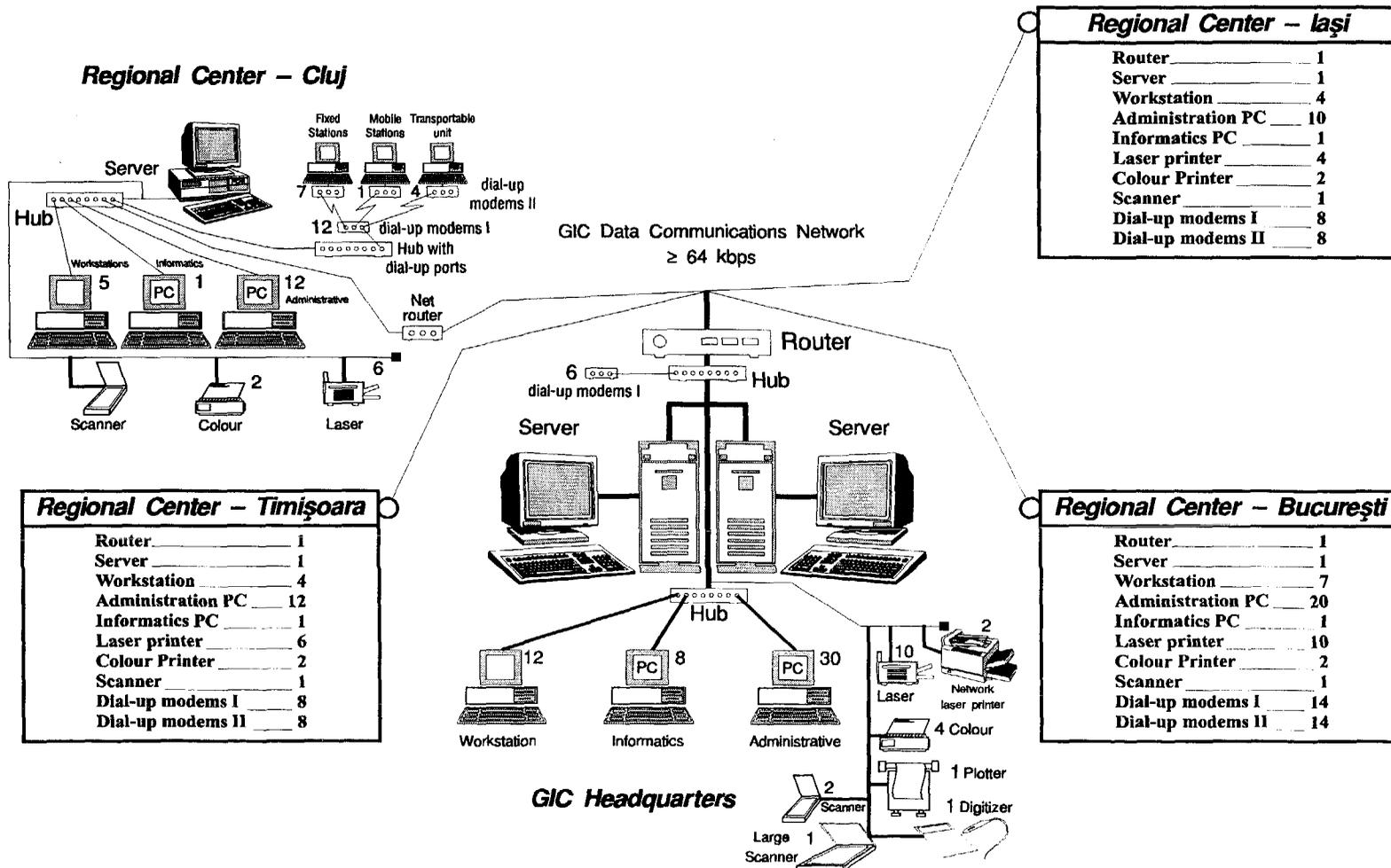
Spectrum Control Activities

Type of Activity	Regions				TOTAL				Avg. Ann. Change 1993/1996
	1993	1994	1995	1996	1993	1994	1995	1996	
Radio station or network inspections:-									
Bucharest	650	780	1,190	1,640					
Cluj	320	350	520	1,060					
Iasi	210	245	314	835					
Timisoara	220	230	380	872					
Total	1,400	1,605	2,404	4,407	1,400	1,605	2,404	4,407	49%
Interference cases:-					22	43	44	73	55%
Finding of violations of the radio regulations:-					1,689	1,527	913	706	-24%
TOTAL					3,120	3,175	3,361	5,186	21%

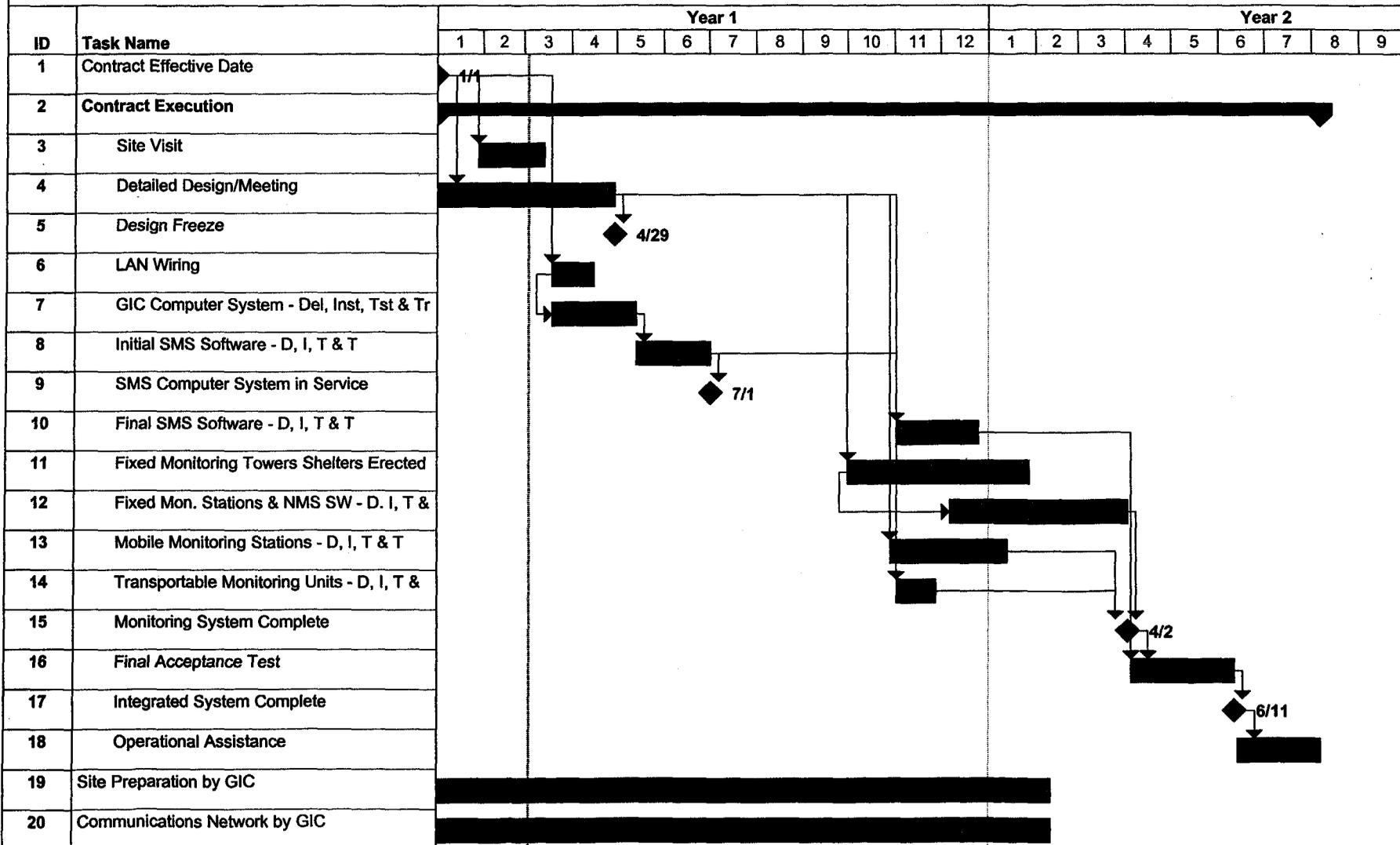
ROMANIA

Telecommunications Reform and Privatization Support Project

Fig. 2 Block Diagram of Proposed GIC Computer Network



ROMANIA
Telecommunications Reform and Privatization Support Project
Figure 1 - NSMS Implementation Schedule



ROMANIA
Telecommunications Reform and Privatization Support Project
Romania's Commitments to the WTO on Basic Telecommunications

Modes of Supply: 1) Cross-border Supply 2) Consumption Abroad 3) Commercial Presence 4) Presence of Natural Persons

Sector or Subsector	Limitations on Market Access	Limitations on National Treatment	Additional Comments
<p>Telecommunications Services (Excluding broadcast distribution to the general public of radio or television programming)</p> <p>All subsectors</p>	<p>Licenses and permissions are granted only to entities with Romanian judicial personality established according to the Romanian legislation</p> <p>Only Romanian Signatories have the right to links with International Satellite Organizations</p>		<p>As attached.</p> <p>Network operations and services supply require licenses or permissions issued by the regulatory authority.</p> <p>Licensing conditions, for all sub-sectors, may provide the application of the universal service principles as defined by the regulatory authority.</p>
<p>(a) Voice telephone services Local/Long-distance/ International</p> <p>- for public use - facilities-based - resale-based - wire-based - fixed radio-based</p>	<p>(1) Bypass of Romtelecom network is not allowed until 12/31/2002. None as of 01/01/2003.</p> <p>(2) None</p> <p>(3) Reserved to Romtelecom for exclusive supply until 12/31/2002. None as of 01/01/2003.</p> <p>(4) Unbound except as indicated in the horizontal section</p>	<p>(1) None</p> <p>(2) None</p> <p>(3) None</p> <p>(4) Unbound except as indicated in the horizontal section</p>	
<p>(a) Voice telephone services</p> <p>- for non-public use</p>	<p>(1) None</p> <p>(2) None</p> <p>(3) None except connection to the public telephone network is not until 12/31/2002.</p> <p>(4) Unbound except as indicated in the horizontal section</p>	<p>(1) None</p> <p>(2) None</p> <p>(3) None</p> <p>(4) Unbound except as indicated in the horizontal section</p>	
<p>(b) Packet-switched data transmission services</p> <p>(c) Circuit-switched data transmission services</p>	<p>(1) None</p> <p>(2) None</p> <p>(3) None</p> <p>(4) Unbound except as indicated in the horizontal section</p>	<p>(1) None</p> <p>(2) None</p> <p>(3) None</p> <p>(4) Unbound except as indicated in the horizontal section</p>	

ROMANIA
Telecommunications Reform and Privatization Support Project
Romania's Commitments to the WTO on Basic Telecommunications
Modes of Supply: 1) Cross-border Supply 2) Consumption Abroad 3) Commercial Presence 4) Presence of Natural Persons

Sector or Subsector	Limitations on Market Access	Limitations on National Treatment	Additional Comments
(e) Telegraph services	(2) None (3) Reserved to Romtelecom for exclusive supply until 12/31/2002. None as of 01/01/2003 (4) Unbound except as indicated in the horizontal section	(2) None (3) None (4) Unbound except as indicated in the horizontal section	
(f) Facsimile services	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) (4) Unbound except as indicated in the horizontal section	
(g) Leased circuit services	(1) None as of 01/01/2003 (2) None (3) None as of 01/01/2003 (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	
(h) Other services - Analog cellular mobile telephony (450 MHz/NMT)	(1) None except bypass of Romtelecom international public telephone network is not allowed until 12/31/2002 (2) None (3) None except: - exclusive supply reserved to Telefonica Romania up to 04/01/2002 - wire-based infrastructure reserved to Romtelecom for exclusive supply until 12/31/2002 (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	

ROMANIA
Telecommunications Reform and Privatization Support Project
Romania's Commitments to the WTO on Basic Telecommunications
Modes of Supply: 1) Cross-border Supply 2) Consumption Abroad 3) Commercial Presence 4) Presence of Natural Persons

Sector or Subsector	Limitations on Market Access	Limitations on National Treatment	Additional Comments
- Digital cellular mobile telephony (900 MHz/GSM)	(1) None except bypass of Romtelecom International public telephone network is not allowed until 12/31/2002 (2) None (3) None except wire-based infrastructure reserved to Romtelecom for exclusive supply until 12/31/2002 (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	
- Paging services	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	
- VSAT services for non-public use	(1) None (2) None (3) None except connection to the public network is not allowed until 12/31/2002 (4) Unbound except as indicated in the horizontal section	(1) None (2) None (3) None (4) Unbound except as indicated in the horizontal section	

1) Adopted under the Government Ordinance no.1 of January 19, 1998

ROMANIA
Telecommunications Reform and Privatization Support Project
Additional Commitments to the WTO on Basic Telecommunications

Scope

The following are definitions and principles on the regulatory framework for the basic telecommunications services.

Definitions

Users mean service consumers and service suppliers

Essential facilities mean facilities of a public telecommunications transport network or service that

- (a) are exclusively or predominantly provided by a single or limited number of suppliers; and
- (b) cannot feasibly be economically or technically substituted in order to provide a service.

A major supplier is a supplier which has the ability to materially affect the terms of participation (having regard to price and supply) in the relevant market for basic telecommunications services as a result of:

- (a) control over essential facilities; or
- (b) use of its position in the market

1. Competitive Safeguards

1.1 Prevention of Anti-competitive practices in telecommunications

Appropriate measures shall be maintained for the purpose of preventing suppliers who, alone or together, are a major supplier from engaging in or continuing anti-competitive practices.

1.2 Safeguards

The anti-competitive practices referred to above shall include in particular:

- (a) engaging in anti-competitive cross-subsidization
- (b) using information obtained from competitors with anti-competitive results; and
- (c) not making available to other services suppliers on a timely basis technical information about essential facilities and commercially relevant information which are necessary for them to provide services.

2. Interconnection

2.1 This section applies to linking with suppliers providing public telecommunications transport networks or services in order to allow the users of one supplier to communicate with users of another supplier, where specific commitments are undertaken.

2.2 Interconnection to be ensured

Interconnection with a major supplier will be ensured at any technically feasible point in the network. Such interconnection is provided:

- (a) under non-disciplinary terms, conditions (including technical standards and specifications) and rates and of a quality no less favorable than that provided for its own like services or for like services of non-affiliated service suppliers for its subsidiaries or other affiliates;
- (b) in a timely fashion, on terms, conditions (including technical standards and specifications) and cost-oriented rates that are transparent, reasonable, having regard to economic feasibility, and sufficiently unbundled so that the supplier need not pay for network components or facilities that it does not require for their service to be provided; and
- (c) upon request at points in addition to the network termination and points offered to the majority of users, subject to charges that reflect the cost of construction of necessary additional facilities.

2.3 Public availability of the procedures for interconnection negotiations

The procedures applicable for interconnection to a major supplier will be made publicly available.

2.4 Transparency of interconnection arrangements

It is ensured that a major supplier will make publicly available either its interconnection agreements or a reference interconnection offer.

2.5 Interconnection: dispute settlement

A service supplier requesting interconnection with a major supplier will have recourse, either:

- (a) at any time; or
- (b) after a reasonable period of time which has been made publicly known to an independent domestic body, which may be a regulatory body as referred to in paragraph 5 below, to resolve disputes regarding terms, conditions and rates for interconnection within a reasonable period of time, to the extent that these have not been established previously.

3. Universal Service

Any member has the right to define the kind of universal service obligation it wishes to maintain. Such obligations will not be regarded as anti-competitive *per se*, provided they are administered in a transparent, non-discriminatory and competitively neutral manner and are not more burdensome than necessary for the kind of universal service defined by the Member.

4. Public Availability of Licensing Criteria

Where a license is required, the following will be made publicly available:

- (a) all the licensing criteria and the period of time normally required to reach a decision concerning an application for a license; and
- (b) the terms and conditions of individual licenses.

The reasons for the denial of a license will be made known to the applicant upon request.

5. Independent Regulators

The regulatory body is separate from, and not accountable to, any supplier of basic telecommunications services. The decisions of and the procedures used by regulators shall be impartial with respect to all market participants.

6. Allocation and Use of Scarce Resources

Any procedures for the allocation and use of scarce resources, including frequencies, numbers and rights of way, will be carried out in an objective, timely, transparent and non-discriminatory manner. The current state of allocated frequency bands will be made publicly available, but detailed identification of frequencies allocated for specific government uses is not required.

ROMANIA
Privatisation of RomTelecom
Appointment of Advisors to the Ministry of Communications
Terms of Reference for Privatisation Advisors¹

The Government of Romania (GoR) intends to privatise the Romanian national telecommunications operator RomTelecom R.A. (RT) through the participation of a strategic investor as an initial stage of the privatisation. Romanian Ministry of Communications (MoC) intends to appoint Privatisation Advisors with relevant experience in privatisation of telecommunication operators to provide financial, legal and technical / economic advisory services to the MoC for the privatisation of RT. The Privatisation Advisors should be led by an international investment bank and include a law firm and technical / economic consultants.

The GoR will establish a Steering Committee (SC) chaired by the Minister of Communications and with representation from Ministry of Communications, Ministry of Reform, Ministry of Finance, Ministry of Justice, etc. The SC will decide on all aspects related to the RT privatisation. The monthly and other reports prepared by the Privatisation Advisors will be reviewed by the SC and the Privatisation Advisors will be required to attend to present them.

Objectives

1. GoR's objectives in carrying out the privatisation of RT are to:

- (i) maximise the prospects for investment in RT,
- (ii) achieve service improvement objectives, including objectives for rural service as well as urban, consistent with (i),
- (iii) develop the regulatory framework and the restructuring and privatisation framework to maximise the success of the privatisation, in order to prepare RT for a competition environment,
- (iv) arrange an international competitive tender to attract a strategic investor to RT consistent with GoR's decision based on (iii),
- (v) maximise the proceeds of the sale consistent with the above objectives,
- (vi) create conditions for the further privatisation of RT at a future stage,

all having full regard to the national interest and the interests of RT customers and employees.

The Privatisation Advisors are required to assist MoC in achieving the above objectives by advising on, planning and executing the privatisation.

Scope of Work

2. The scope of work and tasks provided below are indicative only and the Privatisation Advisors are responsible for carrying out all work needed to achieve the objectives of the assignment whether or not expressly requested by the SC. In order to provide the full range of expertise under this assignment it is expected that this will be provided through a single lead firm, the Privatisation Advisors, which will comprise (i) an investment bank; (ii) a law firm and, if necessary, joint venture arrangements with other appropriate firms (technical and economic consultants). The

¹ Relevant sections extracted from the TORs

Privatisation Advisors are expected to liaise with all government organisations as requested for the implementation of the privatisation and to co-operate with any other appointed advisors (e.g. regulatory). The Privatisation Advisors will be expected to report monthly to the SC on its progress and to report comprehensively at the completion of each task. These reports must be followed by a presentation to the SC during which the Privatisation Advisors will describe their work, findings and recommendations. The SC will then be entitled to recommend that further work and revisions be undertaken in respect of tasks covered by the report or instruct the Privatisation Advisors to move to the next step / task, or a combination of these.

Task 1: Review of Privatisation Framework

3. This task requires a review of the sector policy, legal, regulatory and privatisation framework and development of a detailed workplan for the rest of the work.
 - (a) review the policy, legal, regulatory, licence, tariff regime and privatisation framework referring to previous studies;
 - (b) identify any additional work which is not part of the scope of work under this contract, and which would need to be carried out to support the tasks for the privatisation;
 - (c) where considered essential, recommend revisions / amendments to the framework with supporting justification;
 - d) prepare (revise) the detailed workplan and time-table, clearly identifying the milestones, critical actions and responsibilities for actions.

Deliverable: Report, workplan and presentation.

Task 2: RT Corporate, Business, Financial, Legal and Labor Due-diligence

4. This task requires business, corporate governance, financial, legal and labor due-diligence of RT, fully identifying RT's principal strengths and weaknesses, together with key areas of business potential.
 - A. Business, Corporate and Financial Due Diligence*
 - Review RT's organisational structure, the functions and responsibilities of its management, its personnel and management practices, including recommending possible staff incentive measures ;
 - Evaluate the company's key performance indicators, assess its comparative advantages/ disadvantages and compare with other telecom companies;
 - Review the audits of RT's financial accounts in accordance with IAS and Romanian standards. RT will commission its auditors (Coopers & Lybrand) to carry out any additional audit work that is needed to fulfil the objectives under this assignment.
 - Develop a confidential financial / economic model of RT to be used to : (a) prepare a 10-year financial forecast of RT under different assumptions / scenarios concerning demand, investment levels, efficiency, etc; (b) assess various pricing, service and competition options (see Task 3 below); (c) conduct a valuation of the company under different scenarios and using different methodologies (see Task 4 B below).

Deliverable: Due diligence report and financial / economic model, a report and a presentation.

B. Legal Due-diligence

- (a) carry out a due-diligence to address legal issues pertaining to the transition of RT to a privatised company in such areas as : supply and customer contracts; existing interconnection contracts with other firms, joint venture agreements, the status of RT debt which is currently guaranteed by the government and waivers needed from creditors and suppliers in respect of the privatisation; current staff entitlement and major labour and union contracts; and title to assets and properties;
- (b) based on (a) above, identify specific actions required to facilitate / complete the introduction of a strategic investor as a shareholder of RT and prepare all necessary documentation;
- (c) recommend and prepare revisions necessary to the corporate documents of RT.

Deliverable: All necessary legal documentation, a report and a presentation.

C. Labor Due Diligence

- Review the labor productivity / efficiency of RT and compare with a broad sampling of other telecom operators;
- Identify the optimal productivity / labor levels that could be achieved by a privatised RT;
- Identify the options for improving labor productivity before / after privatisation, and the costs/ benefits of these alternatives, drawing particular attention to social costs;
- Develop options for labor participation in the privatisation;
- Develop options for retraining / severance, as necessary, including the cost of implementing these measures;
- Determine the potential pension liabilities and identify options / costs of handling these liabilities.

Deliverable: Due diligence report , a report and a presentation.

**Task 3: Analysis of Impact of Sectoral Objectives,
Pricing and Competition Regime**

5. An important element of the privatisation will be the establishment of the sectoral objectives, and the pricing and the competition regime. An economic advisor will be hired separately to advise on sectoral objectives, pricing and competition / liberalisation. The Privatisation Advisors will be responsible for constructing the financial / economic model for RT and testing the options / proposals of the economic advisor concerning sectoral objectives (e.g. coverage targets, quality of service), competition and pricing. Specifically, the Privatisation Advisors will assess the financial, economic and technical impact / viability of :
 - Different sectoral objectives, in terms of speed / rate of coverage (penetration), quality of service, etc;
 - Various liberalisation / competition options in terms of timing, services to be liberalised, etc;
 - Various pricing options concerning tariff structure; level and adjustment mechanism.

Deliverable: Analysis of different alternatives / issues with recommendations, a report and a presentation, setting out proposed pricing and competition regime and service targets.

Task 4: Valuation and Sale Strategy

6. This task involves assessing the value of the various networks and other assets and revenue streams of RT and developing a sale strategy and satisfactory bidding process based on the objectives for privatisation, the sector policies and regulatory conditions chosen and the valuation results.

A. Valuation

(a) Value the shares of RT using similar methodologies to those envisaged to be used by the potential strategic investors, such as:

- net asset value
- discounted cash value
- book value
- depreciated replacement value
- break-up value
- future earnings potential and
- any other relevant methodologies

(b) Examine the impact on the valuation above by such factors as more than 25% but less than 49% of RT's shares offered, extent of management and/or operational control offered to strategic investor, etc;

(c) Compare the values resulting in (a) and (b) above to those from other telecommunication privatisation in the region and other relevant countries;

Deliverable: A report and a presentation.

B. Sales Strategy

(a) Based on the results from the above valuation, recommend an appropriate sale strategy consistent with the GoR's objectives and with the sector policies (including customer and personnel interests) and privatisation framework adopted by the GoR;

(b) The strategy should take into consideration the following:

- domestic trends affecting privatisation, including the state of the economy and its future prospects, growth patterns in the Romanian telecommunications sector, inflation and exchange rate trends, developments in the capital markets, and other factors;
- the licence conditions and service objectives which are to be observed and
- national interests and those of RT's customers and personnel

Deliverable: A report and a presentation.

Task 5: Sale of RT's Shares

7. This task involves preparation of all documents needed for share sale whether by capital increase or purchase of existing shares, identifying potential bidders, securing statements of interest from prospective bidders, conducting the bidding process of sale, finalising the sale transaction and assisting with any public / media relations campaign deemed necessary.

Preparatory work / Information memorandum

(a) Define the whole bidding process / procedures and a timetable for sale execution;

(b) Prepare a Preliminary Sales Brochure and, subsequently, the detailed Information Memorandum for approval by SC and distribution to potential investors;

(c) Assist the GoR representatives in conducting “road shows” to promote the privatisation through participation of strategic investors.

Pre-qualification

(d) Recommend criteria for pre-qualification of interested investors, prepare all relevant pre-qualification documentation and carry out the pre-qualification process, evaluate and recommend to SC the pre-qualified investors for bidding;

Bidding and Sales Documents

(e) Review and collect (and prepare where necessary) all documents to be provided in the data room made available by MoC / RT;

(f) Review the draft licence / contract prepared for RT (prepared in April / May 1997) and propose modifications, where deemed necessary, to reflect the privatisation strategy, competition and pricing regime, service targets, etc. Prepare the necessary annexes to the licence / contract, setting out inter alia : the service obligations (coverage, quality of service, etc); pricing regime (tariff structure, levels, and adjustments mechanism and process); competition regime; etc (with input from economic advisor); obligations against RT personnel, including retraining;

(g) Prepare all draft sale documentation such as the amendments to corporate documents, Sale & Purchase Agreement, etc;

(h) Assist the SC in discussions with pre-qualified investors concerning the draft licence and sales documents. Based on SC decisions, finalise the licence and sales documents for distribution to pre-qualified bidders.

Bidding

(i) Prepare and finalise all documents necessary for bidding for the sale of RT shares by pre-qualified investors (including bid evaluation criteria and methodology), carry out the bidding process and assist SC in the evaluation of offers (including developing a comparative assessment of the bidders) and selection of preferred investor in accordance with the established bid evaluation criteria and methodology;

(j) Prepare an evaluation memorandum for outside constituencies, including the GoR and prospective multilateral or other international financial institutions, describing the findings and the comparative assessment / rankings;

(k) Assist the GoR in finalising the contract award / signature.

Financial closing

(l) Provide support (including drafting or assessing of all necessary legal documents), as required up to the financial closing of the sale, optimising the financial and legal contract structure and signing all agreements.

Pre - / Post - closing

(m) Provide support to the pre - / post - closing activities such as company registration, issue of shares, amendments to licence / concession, court approval, public relations, press release etc.

General

(n) Assist SC in all phases - pre-qualification, bidding, negotiation, sale and post closing - and be available to SC in resolving any issues during the process and post-closing and manage the process in order to maintain the highest standards of integrity, efficiency, fairness and transparency. Provide ad-hoc assistance during the process, including gathering of additional materials as needed, evaluation of interim results, and proposals and support in communications with third parties;

(o) Work with SC in developing and implementing a media campaign, both for general public relations and for expanding investor-interest in RT nationally and internationally.

Deliverables: All documents (in draft and final form) as required, presentations to SC at all decisions stages, completion report for the assignment.

Organisational Arrangements

8. The GoR will appoint the SC as described above under para 13. A Project Team (PT) will be established to work with the Privatisation Advisors to implement the privatisation and to provide the primary interface between the Privatisation Advisors, MoC, RT and other parties involved.

Services to be Provided by the Romanian Authorities

9. The GoR, through SC and PT, will :
- arrange access to the relevant government officials and senior officials and management of RT, and assist in arranging meetings;
 - provide access to all relevant information, studies, legal documents, etc; and
 - provide qualified counterparts.

Romania
Telecommunications Reform and Privatization Support Project
Regulatory Development Program Design

Draft Terms of Reference

Background and Objective

The Government of Romania (GOR) has initiated a program of reforms in the telecommunications sector, with assistance from the EU and World Bank, which would: (a) restructure the telecommunications sector to increase the efficiency and its attractiveness to private investments, and privatize Rom Telecom; (b) introduce competition and expand communications services through liberalization; and (c) develop an independent agency for regulation of the sector, including allocation, monitoring and management of radio frequencies. Rom Telecom has been converted into a joint stock company and the firm of Goldman Sachs (investment bank) has been hired to assist with privatization of Rom Telecom. The General Inspectorate of Communications (GIC) would be developed into an independent regulatory body for telecommunications. The consulting firm of ASTEC, a consortium of four European firms, has been recruited to develop recommendations for harmonizing the regulatory framework for telecommunications in Romania with the applicable EC Directives. The consultants would also prepare the required regulations to support their recommendations covering both technical and economic aspects of telecommunications regulation and also support the privatization of Rom telecom. The general recommendations are expected to be available by early-June 1998.

The objective of this assignment is to design a program for the development of GIC into a full fledged regulatory body for the sector, which will be implemented by GIC under the direction of GOR. The design phase would build upon the recommendations of ASTEC as necessary and cover all aspects for implementing the recommendations, including GIC's institutional aspects. Both the design phase and implementation phase of the regulatory development program (RDP) would be financed from the proposed World Bank project.

Scope of Work

The scope of work would include detailed actions plans for implementation of capacity building in regulations, including time table, staffing and training plans, transfer of regulatory responsibilities from the Ministry of Communications (MOC) to GIC, institutional restructuring of GIC as necessary, financial management and reporting, etc. The implementation would be carried out with the help of consultants and/or an experienced telecommunications regulatory agency.

Regulatory Framework, Regulation and Issues

This task requires identification of all issues related to telecommunications regulation in the context of the new regulatory framework to be adopted and provide recommendations for dealing with them. Specifically, the task includes:

- (a) review and confirm with the MOC the sectoral objectives, including regulations;
- (b) review of the existing regulatory arrangements and consultant recommendations concerning technical, economic, competition and institutional aspects;
- (c) assess the adequacy of the arrangements and identify the areas where specific actions are required to achieve the objectives and address all issues identified with international examples of how similar issues have been dealt with in other countries; and

- (d) prepare a detailed set of recommendations for MOC and GIC.

GIC Institutional Development

This task requires a complete assessment of GIC with a view to prepare a complete and detailed set of action plan for implementation. Specifically, this involves:

(a) definition of the basic principles governing regulation and regulatory body for telecommunications in Romania. Such principles should include: *independence* (the nature and degree of independence of GIC from both entities which would be regulated and policy makers), *structure* (the legal, organizational and administrative arrangements under which GIC will function as an independent body, including its accountability and reporting obligations), *autonomy* (the parameters which ensure both operational autonomy through appointment of qualified regulators on transparent basis and financial autonomy through financing of GIC from regulatory services), *scope* (GIC's purview of regulation as well as the necessary instruments for them, i.e. economic regulation, technical regulation, interconnection regulation, service quality regulation, monopoly operator regulation, promotion of competition, spectrum assignment and licensing, etc.);

(b) review and confirm with MOC and GIC these principles and develop recommendations for action, including appropriate time schedule showing how the full scope of these principles in the regulatory set up could be achieved;

(c) review the institutional structure of GIC (legal, organizational, administrative, etc) and develop a capacity building plan for GIC, including recommendations for any restructuring of GIC, especially as it relates to the absorption of staff from the MOC for regulation. The capacity building plan should cover the following aspects:

- definition of strategic and operational plan with clear agenda of the tasks to be performed by the GIC to monitor the sector and properly enforce the provisions of the legal and regulatory framework;
- definition of the appropriate structure for GIC to carry out both wireless and wireline regulations;
- establishment of internal administrative procedures for efficient operation, including regulations for dealing with staff conflict of interest, etc.;
- definition of job functions and an appropriate recruitment strategy to attract qualified staff to GIC;
- definition of financial sources for running GIC's operations such as from license fees, etc.;
- preparation of a detailed training plan, both in-house and external training.

The report shall include detailed action plan and terms of reference for follow on implementation. The duration of this assignment is expected to be about three-four months.

ROMANIA
Telecommunications Reform and Privatization Support Project
Project Costs, Financing Plan and Disbursements - 1998/99

(In US\$ 000s)

Item	Estimated Cost			Jan/Jan 1998			Jul/Dec 1998			Jan/Jan 1999			Jul/Dec 1999		
	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total
Estimated Payments:-															
Sector Reform Component:-															
Policy/Legal/Regulatory*		800	800		65%			35%							
Rom Telecom Privatization*		1000	1000		50%			50%							
Regulatory Agency Component:-															
GIC Computer System	1900		1900				10%			60%			10%		
SMS Application SW	3000		3000				10%			20%			10%		
Monitoring System	21100		21100				10%			20%			20%		
Inst., Test & Training		4000	4000					10%		20%				20%	
Electronics Workshop		1250	1250					10%		20%				50%	
Regional Laboratories		3000	3000					10%		20%				50%	
Site prep, etc.		700	700					10%		10%				20%	
Project Management & Eng.	400	400	800				10%	10%		10%	10%		20%	20%	
Capacity Building	400	1500	1900							10%	10%		20%	20%	
Physical contingency	2100	800	2900							10%	10%		20%	20%	
Price contingency	1100	550	1650							10%	10%		20%	20%	
Total	30000	14000	44000												
Estimated Disbursements:-															
Sector Reform Component:-															
Policy/Legal/Regulatory*		800	800	0	520	520	0	280	280	0	0	0	0	0	0
Rom Telecom Privatization*		1000	1000	0	500	500	0	500	500	0	0	0	0	0	0
Regulatory Agency Component:-															
GIC Computer System	1900		1900	0	0	0	190	0	190	1140	0	1140	190	0	190
SMS Application SW	3000		3000	0	0	0	300	0	300	600	0	600	300	0	300
Monitoring System	21100		21100	0	0	0	2110	0	2110	4220	0	4220	4220	0	4220
Inst., Test & Training		4000	4000	0	0	0	0	400	400	0	800	800	0	800	800
Electronics Workshop		1250	1250	0	0	0	0	125	125	0	250	250	0	625	625
Regional Laboratories		3000	3000	0	0	0	0	300	300	0	600	600	0	1500	1500
Site prep, etc.		700	700	0	0	0	0	70	70	0	70	70	0	140	140
Project Management & Eng.	400	400	800	0	0	0	40	40	80	40	40	80	80	80	160
Capacity Building	400	1500	1900	0	0	0	0	0	0	40	150	190	80	300	380
Physical contingency	2100	800	2900	0	0	0	0	0	0	210	80	290	420	160	580
Price contingency	1100	550	1650	0	0	0	0	0	0	110	55	165	220	110	330
Totals	30000	14000	44000	0	1020	1020	2640	1715	4355	6360	2045	8405	5510	3715	9225
Cumulative - WB				0			2640			9000			14510		
Cumulative - GIC					1020			2735			4780			8495	
Cumulative - Total						1020			5375			13780			23005
Cumulative % - WB				0%			9%			30%			48%		
Cumulative % - GIC					7%			20%		34%			61%		
Cumulative % - Total						2%			12%			31%			52%

* Financing from GOR/EU sources.

ROMANIA
Telecommunications Reform and Privatization Support Project
Project Costs, Financing Plan and Disbursements - 2000/01
(in US\$ 000s)

Item	Estimated Cost			Jan/Jun 2000			Jul/Dec 2000			Jan/Jun 2001			Jul/Dec 2001			Total			
	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	WB Loan	GIC	Total	
Estimated Payments:-																			
Sector Reform Component:-																			
Policy/Legal/Regulatory*		800	800														0%	100%	100%
Rom Telecom Privatization*		1000	1000														0%	100%	100%
Regulatory Agency Component:-																			
GIC Computer System	1900		1900					10%			10%						100%	0%	100%
SMS Application SW	3000		3000	40%				10%			10%						100%	0%	100%
Monitoring System	21100		21100	30%				10%			5%			5%			100%	0%	100%
Inst., Test & Training		4000	4000		30%				10%			5%		5%			0%	100%	100%
Electronics Workshop		1250	1250		20%												0%	100%	100%
Regional Laboratories		3000	3000		20%												0%	100%	100%
Site prep, etc.		700	700		20%				20%			10%					0%	100%	100%
Project Management & Eng.	400	400	800	20%	20%		20%	20%		10%	10%		10%	10%			100%	100%	200%
Capacity Building	400	1500	1900	20%	20%		30%	20%		20%	20%			10%			100%	100%	200%
Physical contingency	2100	800	2900	30%	30%		30%	30%		5%	5%			5%			100%	100%	200%
Price contingency	1100	550	1650	30%	30%		30%	30%		5%	5%			5%			100%	100%	200%
Total	30000	14000	44000																
Estimated Disbursements:-																			
Sector Reform Component:-																			
Policy/Legal/Regulatory*		800	800	0	0	0	0	0	0	0	0	0	0	0	0	0	0	800	800
Rom Telecom Privatization*		1000	1000	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1000	1000
Regulatory Agency Component:-																			
GIC Computer System	1900		1900	0	0	0	190	0	190	190	0	190	0	0	0	1900	0	0	1900
SMS Application SW	3000		3000	1200	0	1200	300	0	300	300	0	300	0	0	0	3000	0	0	3000
Monitoring System	21100		21100	6330	0	6330	2110	0	2110	1055	0	1055	1055	0	1055	21100	0	0	21100
Inst., Test & Training		4000	4000	0	1200	1200	0	400	400	0	200	200	0	200	200	0	0	4000	4000
Electronics Workshop		1250	1250	0	250	250	0	0	0	0	0	0	0	0	0	0	0	1250	1250
Regional Laboratories		3000	3000	0	600	600	0	0	0	0	0	0	0	0	0	0	0	3000	3000
Site prep, etc.		700	700	0	140	140	0	140	140	0	70	70	0	70	70	0	0	700	700
Project Management & Eng.	400	400	800	80	80	160	80	80	160	40	40	80	40	40	80	400	400	800	800
Capacity Building	400	1500	1900	80	300	380	120	300	420	80	300	380	0	150	150	400	1500	1900	1900
Physical contingency	2100	800	2900	630	240	870	630	240	870	105	40	145	105	40	145	2100	800	2900	2900
Price contingency	1100	550	1650	330	165	495	330	165	495	55	28	83	55	28	83	1100	550	1650	1650
Totals	30000	14000	44000	8650	2975	11625	3760	1325	5085	1825	678	2503	1255	528	1783	30000	14000	44000	44000
Cumulative - WB				23160			26920			28745		30000							
Cumulative - GIC					11470			12795		13473		14000							
Cumulative - Total						34630			39715		42218				44000				
Cumulative % - WB				77%			90%			96%		100%							
Cumulative % - GIC					82%			91%		96%		100%							
Cumulative % - Total						79%			90%		96%				100%				

* Financing from GOREU sources.

ROMANIA

Telecommunications Reform and Privatization Support Project

GIC Income Statement - Actual 1992 - 1996 (unaudited)

(US\$ 000s)

	1992	1993	1994	1995	1996
Operating Income					
Basic Operating Income	633	370	827	844	1,040
GSM - cellular					2,130
Total Operating Income	633	370	827	844	3,170
Operating Expense					
Consumed Suppliees	16	24	27	30	30
Personnel Charges	178	206	401	470	485
Repayment	13	33	14	115	133
Other Expenses	97	79	135	109	155
Total Operating Expense	304	342	577	732	803
Operating Income	329	28	250	112	2,367
Exceptional Items	32	15	47	55	62
Gross Operating Income	361	43	297	167	2,429
Income Taxes				64	882
Profit Repatriation					
Constituting Legal Reserves				8	121
Employee Profit Participation Fund				9	140
Dividend to MOF				44	656
Surplus to Development Fund				42	630

ROMANIA
Telecommunications Reform and Privatization Support Project
GIC INCOME STATEMENT - Forecast (US\$ 000)

	1997*	1998	1999	2000	2001	2002	2003	2004
Revenue								
Basic Operating Income	\$1,100	\$2,100	\$3,000	\$3,500	\$4,100	\$4,500	\$5,000	\$5,500
GSM Cellular	\$10,800	\$14,100	\$14,100	\$14,100	\$14,100	\$14,100	\$14,100	\$14,100
New Service Provider (PCS?)						\$1,000	\$2,500	\$5,000
Total Operating Revenue	\$11,900	\$16,200	\$17,100	\$17,600	\$18,200	\$19,600	\$21,600	\$24,600
Operating Expense								
Consumed Supplies	\$100	\$200	\$300	\$350	\$400	\$450	\$500	\$550
Personnel Charges	\$700	\$1,700	\$2,600	\$3,100	\$3,400	\$3,700	\$4,100	\$4,500
Depreciation	\$140	\$240	\$374	\$1,092	\$2,306	\$3,088	\$3,240	\$3,208
Communication Network Lease	\$0	\$300	\$500	\$500	\$500	\$500	\$500	\$500
NSMS Expenses	\$0	\$80	\$820	\$810	\$430	\$60	\$0	\$0
Insurance	\$0	\$1,200	\$2,400	\$2,300	\$2,200	\$2,100	\$2,000	\$1,900
Loan Commitment Fee	\$0	\$72	\$54	\$23	\$4	\$0	\$0	\$0
Interest on Loan	\$0	\$94	\$596	\$1,446	\$1,994	\$2,100	\$2,078	\$2,009
Other Expenses	\$200	\$400	\$500	\$600	\$650	\$700	\$750	\$800
Total Operating Expense	\$940	\$3,885	\$7,644	\$9,622	\$11,233	\$11,998	\$12,418	\$12,668
Operating Income	\$10,960	\$12,315	\$9,456	\$7,978	\$6,967	\$7,602	\$9,182	\$11,932
Income Tax	\$4,165	\$4,680	\$3,593	\$3,032	\$2,647	\$2,889	\$3,489	\$4,534
Net Operating Income	\$6,795	\$7,635	\$5,863	\$4,947	\$4,319	\$4,713	\$5,693	\$7,398
Employees Profit Fund	\$680	\$764	\$586	\$495	\$432	\$471	\$569	\$740
Surplus to MOF	\$3,064	\$3,443	\$2,643	\$2,230	\$1,948	\$2,125	\$2,567	\$3,336
Surplus to Development Fund	\$3,052	\$3,429	\$2,633	\$2,222	\$1,940	\$2,117	\$2,557	\$3,322
Balance	\$0							
Operating Ratio (%)	8%	24%	45%	55%	62%	61%	57%	51%
DSCR (times)	N/A	133.84	16.48	6.27	4.65	5.09	4.58	4.55

Assumptions:-

1. Basic Operating Income includes the fee of \$0.30 per line for supervision and regulation of Rom Telecom.
2. GSM Cellular revenue consists of the annual fees from the existing two operators.
3. New Service Provider revenue includes fees from one DCS 1800 service provider in 2002 plus one more in 2004.
4. * indicates estimated 1997 financial results.

ROMANIA
Telecommunications Reform and Privatization Support Project
Project Supervision Plan

Approximate Date (Month/Year)	Activity	Expected Skill Requirement	Staff Input (Staff Weeks)
Aug. 1998	Supervision Mission Rom Telecom Privatization Strategy and NSMS Review.	Sector Policy Privatization Telecom Legal Spectrum Engineering	5.0
Dec. 1998	Supervision Mission Rom Telecom Privatization, RDP and NSMS Review.	Sector Policy Privatization Telecom. Legal Spectrum Engineering	5.0
May 1999	Supervision Mission RDP design, NSMS, GIC Finances review and other Technical Assistance review.	Sector Policy Regulatory Development Telecom Legal Financial Spectrum Engineering	7.0
FY 2000	Supervision Missions Two missions per year to review the implementation progress of RDP, NSMS, GIC Finance, Training Program and other Technical Assistance, including the 2000 mid-term review.	Sector Policy Regulatory Development Spectrum Engineering Financial	2 x 6.0
FY 2001	Supervision Missions Two missions per year to review the implementation progress of RDP, NSMS, GIC Finance, Training Program and other Technical Assistance.	Sector Policy Regulatory Development Spectrum Engineering Financial	2 x 4.0
July-Dec. 2002	Supervision Mission The mission will also provide instructions for preparation of the Implementation Completion Report .	Sector Policy Regulatory Development Spectrum Engineering Financial	4.0

ROMANIA
Telecommunications Reform and Privatization Support Project
Procurement Plan

Activities	NSMS
Bidding Document Completed	Completed
Bidding Notice Publication	Completed
Stage 1 Bid Opening (technical proposal)	Completed
Stage 1 Bids Evaluation Report to the Bank	May 1998
Invitations for Stage 2 Bids	May 1998
Stage 2 Bid Opening (price and technical)	Jun. 1998
Stage 2 Bids Evaluation Report to the Bank	Jul. 1998
Contract signature	Jul/Aug. 1998
NCC/RCC sites available to the contractor	Dec. 1998
GIC computer system in operation	Feb. 1999
Initial SMS in operation	Apr. 1999
All transportable monitoring units in operation	Jun. 1999
Eliminate backlog of license applications in Bucharest and major cities	Jul. 1999
Plan to make available band allocations for new PCS services	Sep. 1999
Plans for migration from Warsaw Pact to EU and NATO band allocations	Sep. 1999
All mobile monitoring stations in operation	Dec. 1999
Electronics workshop completed	Jan 2000
Final SMS in operation	Apr. 2000
10 fixed monitoring stations in operation	Jun 2000
In-house training program set up	Jul. 2000
National Monitoring System in operation	Apr. 2001
Integrated NSMS accepted and in service	Jul. 2001
Contract Amount - Local (US\$ million)	4.5
Contract Amount - Foreign (US\$ million)	28.7
Contract Amount - Total (US\$ million)	33.2

ROMANIA
Telecommunications Reform and Privatization Support Project
Procurement Plan

Activities	Project Management and Engineering Support	Capacity Building		Regulatory Development Program	
		Spectrum Planning and Engineering	Market - Oriented Licensing Process	Program Design	Program Implementation
TOR Prepared	Completed	Jun. 1998	Jan. 1999	July 1998	Mar. 1999
Draft Request for Proposal (RFP)	Completed	Jun. 1998	Jan. 1999	July 1998	Mar. 1999
Advertise for Expressions of Interest	Completed	Jul. 1998	Feb. 1999	July 1998	Mar. 1999
Issue the RFP	Completed	Aug. 1998	Mar. 1999	Aug. 1998	May 1999
Deadline for Proposals	15 April 1998	Oct. 1998	May 1999	Oct. 1998	Jun. 1999
Bid Evaluation Report to the Bank	29 May 1998	Dec. 1998	Jun. 1999	Nov. 1998	Jul. 1999
Contract signature	30 Jun. 1998	Jan. 1999	Jul. 1999	Dec. 1998	Sep. 1999
Interim report(s)	quarterly	quarterly	Oct. 1999	Feb. 1999	quarterly
Final report	Jul. 2001	Jan. 2001	Dec. 1999	Mar. 1999	Jun. 2001
Completion of contract	Jul. 2001	Jan. 2001	Dec. 1999	Apr. 1999	Sep. 2001
Contract Amount - Local (US\$ million)	0.2	---	---	---	0.4
Contract Amount - Foreign (US\$ million)	0.8	0.7	0.1	0.25	0.75
Contract Amount - Total (US\$ million)	1.0	0.7	0.1	0.25	1.15

ROMANIA
Telecommunications Reform and Privatization Support Project
Progress and Performance Indicators

Description	Qualitative or Quantitative	Source and Measurement	Timing	Remarks
1. Enable the GIC to establish and maintain an accurate National Frequency Register,	Quantitative	GIC - NSMS database statistics	quarterly, continuing	Trends in capturing missing data
2. Enable the GIC to assign interference-free frequencies,	Quantitative	GIC - NSMS operational statistics	quarterly, continuing	Trends in interference complaints for new assignments
3. Improve GIC service to users by faster processing of applications for licenses,	Quantitative	GIC - NSMS operational statistics	annual, continuing	Trends in application processing times
4. Enable the GIC to detect interference, respond to interference complaints and determine appropriate solutions	Quantitative	GIC - NSMS operational statistics	annual, continuing	Trends in numbers, types and resolution of detected interference and complaints
5. Identification of currently unoccupied spectrum available for immediate assignment in Bucharest and other congested areas	Qualitative	GIC - updated National Frequency Register	June, 1999	GIC monitoring program and spectrum planning and engineering consultant.
6. Determine band occupancies and plans for transition of specific services from the Russian and Warsaw Pact spectrum allocations to the EU/ITU and NATO spectrum allocations	Qualitative	MOC & GIC policies and plans	September, 1999	Draft proposals from GIC and the spectrum planning and engineering consultant.
7. Development of policies for expansion of existing high-value services (such as GSM cellular and digital microwave) and introduction of new services such as wireless local loop, PCS, satellite mobile, etc.	Qualitative	MOC & GIC policies	September, 1999 for PCS	Draft proposals from GIC and the spectrum planning and engineering consultant.

ROMANIA
Telecommunications Reform and Privatization Support Project
Progress and Performance Indicators

Description	Qualitative or Quantitative	Source and Measurement	Timing	Remarks
8. Detection and deterrence of unauthorized or improper users of the spectrum.	Quantitative	GIC - NSMS operational statistics	continuing	Trend in numbers, types and resolution of cases
9. Establish a framework for open consultation with the users of the spectrum and provide a transparent process for determining spectrum-related policies, based on accurate technical data, compliance with international agreements, national development and liberalization priorities, and national security issues.	Qualitative	GIC - program of seminars, briefings and regular, Telecommunications Consultative Committee meetings	continuing	GIC, with assistance from the spectrum planning and engineering consultant
10. Policy options and new strategies for allocation of spectrum to expand existing high value services or introduce new services,	Qualitative	MOC & GIC policies and plans	December, 1999	Deliverable from the spectrum planning and engineering consultant
11. Policy options for determination of appropriate associated fees which enhance revenue to the GOR while promoting desirable development,	Qualitative	MOC & GIC policies	December, 1999	Deliverable from the market-oriented methods of licensing consultant
12. Policy options for methods of competition for network operator licenses and user permits.	Qualitative	MOC & GIC policies	December, 1999	Deliverable from the market-oriented methods of licensing consultant
13. Updated and new spectrum-related documents for release to the public regarding policies, spectrum allocation plans, technical standards, application forms and guidelines	Qualitative	GIC - type and number of documents released to the public.	continuing	GIC and deliverables from the spectrum planning and engineering consultants

Romania
Telecommunications Reform and Privatization Support Project
List of Relevant Documents Available in ECA Project Files

1. Coopers & Lybrand Report on Sector Restructuring and Regulation, 1993
2. Review of Legal and Regulatory Framework for Telecommunications in Romania, 1993, WIK of Germany
3. Development of Spectrum Management in Romania, NTIA, 1994
4. The Telecommunications Development in Romania, 1995 (MOC's Paper to Investors Conference in Bucharest in June 1995)
5. Tariff Restructuring Study Reports by Canadian Teleconsult, 1996 and 1997
6. Feasibility Study for Spectrum Management and Monitoring in Romania, BR Communications, 1996
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