Republic of Iraq
Ministry of Communications
Iraqi Telecommunications and Post Company
State Company for Internet Service

PREPARATORY SUREVEY REPORT
ON
THE CONSTRUCTION AND DEVELOPMENT OF
TELECOMMUNICATIONS NETWORK FOR MAJOR
PROVINCES IN IRAQ

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JAPAN INTERNATIONAL COOPERATION AGENCY

NIPPON KOEI CO., LTD.

Executive Summary

Teledensity of fixed telephones in Iraq from 1985 to 1990 was maintained at a constant level of 5.6%. Due to the 1991 Gulf War and the subsequent economic sanctions, destruction and deterioration of the telecommunications infrastructure was extensive, causing a decline in teledensity to 3.3 % in 2002.

Telecommunications infrastructure, like water and electricity, is a vital industrial base and social infrastructure for people's lives. Therefore, the Government of Iraq set the development of telecommunications infrastructure as one of its highest priorities in the National Development Strategy for 2007-2010.

Under such situation, the Medium-Term Development Strategy (MTDS) for planning of 2010 to 2014 was formulated in the end of 2009 by the Ministry of Communications (MOC).   MTDS emphasizes development of the following telecommunications infrastructure as high priorities.
(1)Expansion of the telecommunication network
(2)Maintaining the existing networks at current level in terms of quality

In order to achieve telecommunications development as indicated above, a budget of USD 216 million was allocated.

1. Current Condition of Telecommunications Network in Iraq

Present telecommunications network in Iraq is composed of three configurations: 1) Backbone transmission network, 2) Switching system, and 3) Local access network.

Backbone transmission network consists of two ways of communications: one is Dense Wavelength Division Multiplexing (DWDM) and the other is microwave radio network. DWDM is operated as a main backbone network, and microwave radio network functions as the back-up of DWDM.   Microwave network has been completed through Japan's Grant Aid Project and the aid of the World Bank during 2004 to 2010.   DWDM will be fully operational by the end of March 2011.   These two backbones can be operated as a reliable integrated telecommunications network backbone in Iraq.

Backbone network and local access network are connected through exchange stations which function for switching and distribution.   Most of the existing switching equipment is legacy public switched telephone networks (PSTN) which can migrate to routers as a component of next generation networks (NGN).   As of 2010, there are a total of 397 exchanges over the whole country of Iraq, and only 6 out of these are out of service. This condition has been much improved if compared with the status in 2006, when there were 71 of 333 exchanges were out of service. This development can be attributed to the great efforts of MOC.

Local access networks have two types which are metallic cable type and optical fiber type. Metallic type is usually used for voice telephone as legacy system, and optical type is for data transmission like computers as Internet Protocol (IP)-based communication.   These subscriber lines are installed between the nearest exchange station and each home or building.

2. Demand Forecast

Demand forecast for the MTDS was reviewed by considering the latest actual data such as population and available telephone lines.   The required expansion of telephone lines in 2016 for Baghdad, Basra and Mosul will be in accordance with the 2009 population of each province as shown below.

Required Expansion for Baghdad, Basra and Mosul in City

City	Population in City in 2009	Ratio of population in 2009	Required expansions in 2016 (K lines)	Requested expansion by MOC in 2009 (K lines)
1. Baghdad	6,250,000	22.9 %	847	200
2. Basra	1,200,000	4.4 %	163	30
3. Mosul	1,800,000	6.6 %	244	56
Total in three Cities	9250,000	33.9 %	1,254	286
Total in Iraq	*27,295,573	100 %	3,700	-

Source: MOC
(*) The populations of 3 Kurdistan provinces are excluded.

The forecasted expansions based on the teledensity target for 2016 are remarkably higher than the requested numbers by MOC (200,000 lines for Baghdad, 30,000 lines for Basra and 56,000 lines for Mosul). It can be concluded that the total requested expansion of 286,000 lines is urgently required for implementation as early as possible to assist improvement of the existing telecommunications network being seriously damaged and to cope with the growing telephone and internet users. In addition, further expansions of the network are continuously needed in the telecommunications sector in Iraq in order to achieve the target of MTDS.

3. Applicable Technology of the Project

NGN is now taking the place of the present legacy PSTN. It is now gradually becoming difficult to repair the conventional PSTN due to the following reasons:

(1)Manufacturer's production of PSTN will soon be terminated, shifting to IP-related products and thus, it will be difficult to procure spares for repair.

(2)Change of business models, i.e., transition from voice to data service, on the part of telecom operators/carriers

(3)Recommendations issued by the International Telecommunications Union's Telecommunication Standardization Sector (ITU-T) and Internet Engineering Task Force (IETF) on the utilization of NGN.

Due to the above situation, it will be inevitable to migrate from the legacy PSTN to a new IP technology-based network, thus MOC and other telecom entities are urgently required to have schemes to establish reliable and efficient nationwide IP networks in the framework of NTDS in the ICT Sector in Iraq.

4. Operation and Maintenance Structure

The Iraqi communications sector is divided into telecommunications and postal services which are provided by the Iraqi Telecommunication and Post Company (ITPC) under the control of the Administrative Management Agency of MOC.   ITPC is an state-owned and monopoly company. The regulatory authority is the Communications and Media Commission (CMC) which controls not only telecom but also the broadcasting sector.

In 2010, MOC/ITPC has completed or has implemented telecommunication projects related backbone transmission network, switching system and local access network. The total budget related these projects reaches USD 131.31 million, and other USD 85 million has been invested for the reinforcement of operating foundations such as communication complex, security and so on. It is evaluated that MOC/ITPC will have management capability of the project from technical and organizational viewpoints.

Regarding financial aspect, MOC's on-going projects will be completed from 2011 to 2013 and the completion of these projects can bring new income to MOC/ITPC, which will rise up the revenue sharply in addition to jumping up of the revenue in 2008 to 2010.

Through the above consideration, MOC/OTPC has project implementation capability in terms of technical, organizational and financial aspects.

5. Project Scope

The following new expansion as illustrated in the figure below is necessary to be established for the improvement of the telecommunications network in Iraq. The project consists of five components as described below.
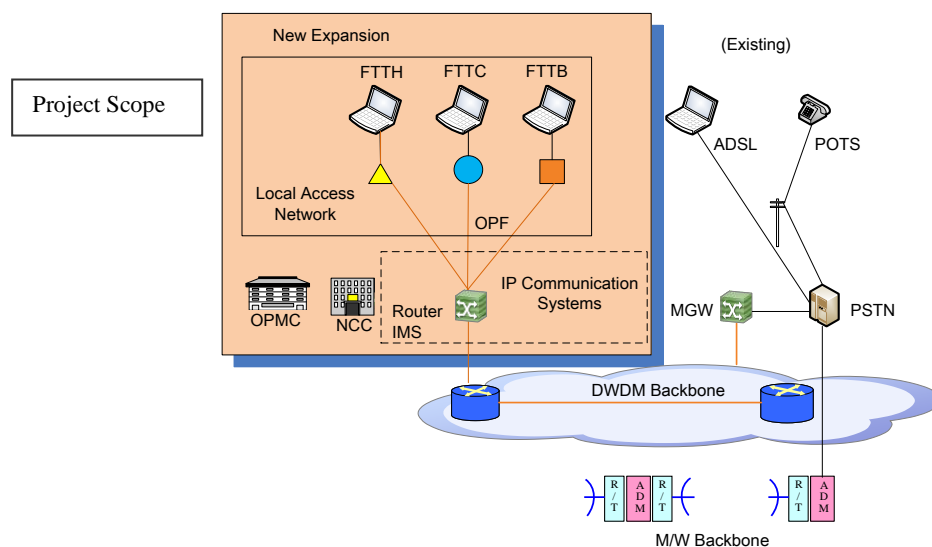
Source: JICA Study Team

(1) IP Communication Systems

IP communication systems are provided for Baghdad, Basra and Mosul. It is composed of IP Multimedia Subsystem (IMS) core, core routers and edge routers. IMS core is installed at a principal core exchange, namely the al-Sink exchange in Baghdad. The core router(s) is/are installed at the core exchange(s) and the edge routers are installed at the local exchanges, respectively. The core exchange is linked with the local exchanges via the existing optic fiber transmission system.

(2) Local Access Network

In the local access network, fiber-to-the-curb (FTTC), fiber-to-the-building (FTTB) and fiber-to-the-home (FTTH) are to be adopted for the project. The line capacities covered by FTTC are 244,000 lines, FTTB for 33,500 lines and FTTC for 8,500 lines, for 286,000 lines in total for the project. The local access network provides broadband services to the subscribers. Among the methods, FTTC plays a prevailing role followed by FTTB. FTTH has minimal application for the sake of security and for protection from power outage.

(3) New Communication Center (NCC)

NCC is constructed in order to handle the increase of the internet traffic in Iraq and to provide reliable internet service to the subscribers. The building is 3-storey and its size is approximately 12 m by 18 m, with a total floor area of 648 m^2.

(4) Outside Plant Maintenance Center (OPMC)

OPMC is constructed in order to provide operation/maintenance services for the new optic fiber cables and will serve as a training center as well. The building is also 3-storey and its size is approximately 30 m by 50 m, with a total floor area of 4,500 m^2.

6. Project Cost

(This Item will be disclosed after the completion of the tendering procedure of this project.)

7. Project Implementation

(This Item will be disclosed after the completion of the tendering procedure of this project.)

8. Environmental and Social Considerations

The adverse environmental and social impacts identified for the Project are only typical and general impacts caused by any construction work, although these impacts will be temporary and insignificant in scale and extent.

By considering the identified environmental and social impacts to be encountered during the construction phase of the Project, it is desirable for the proponent (MOC and ITPC) and/or contractor to take necessary mitigation measures, as follows:

- Safety and sanitary education/training program for construction workers;
- Traffic regulation in the vicinity of construction area when necessary;
- Appropriate operation and maintenance of construction machineries/vehicles; and
- Adequate recycling and/or disposal of residual construction soil and waste.

9. Conclusions and Recommendations

(1) Early Implementation of the Project

The 2003 war in Iraq has extensively damaged the existing telecommunications infrastructure that has put the progress and development of the Iraqi economy behind its neighboring countries. Under these circumstances, MOC has released the MTDS for the years of 2010 – 2014, pledged the rehabilitation and improvement of war-damaged infrastructure, and also intends to modernize and upgrade the whole outdated telecommunications network in association with its state-owned operators, ITPC and SCIS. In order to achieve the MOC target above, it is strongly recommended to implement the project as early as possible to take the following into account:

- Improvement and development of telecommunications network to catch up with the global transition from the legacy PSTN to IP-based networks; and

- Creation of new business models derived from the broadband services and paradigm shift from voice services to data services that IP-based networks can provide.

(2) Effective Management Organization of Iraqis during Implementation

Organization of the executing agency during project implementation is requested to fully fulfill its function. The organization varies by stages, from the design stage, bidding and contract stage, and implementation stage up to the project completion. In order to keep the implementation schedule, it is recommended that the Iraqi government establishes an effective

management organization dedicated to the project, corresponding to each stage of the implementation.

Project management capability and skills on relevant technology are essential for carrying out the project because the NGN system needs high level of knowledge on system integration.   It is therefore essential to take into consideration the selection of a capable contractor and consultant.

(3) Human Resource Development (HRD)

HRD is an essential part of operating a telecommunications system. ITPC has been carrying out excellent HRD programs. However, MOC/ITPC needs new and additional programs in its HRD training scheme since IP-based network technologies related to NGN will be part of their daily operation and maintenance works. From the viewpoint of this technological transition, new HRD schemes are required for successful operation and maintenance of the new systems and facilities. Therefore, HRD should be focusing on the new technologies that constitute IP-based networks, associated with other essential technologies of NGN. HRD is, in principle, intended for the engineers of ITPC/SCIS engaged in the IP communication system. The participating trainees are expected to transfer internally their acquired knowledge and skills to other staffs.