Ministry of Information and Broadcasting

Pakistan Broadcasting Corporation (PBC)

Islamic Republic of Pakistan

PREPARATORY SURVEY REPORT

ON

THE PROJECT FOR REHABILITATION OF MEDIUM WAVE RADIO BROADCASTING NETWORK

IN

THE ISLAMIC REPUBLIC OF PAKISTAN

MAY 2012

JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)

YACHIYO ENGINEERING CO., LTD.

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PREFACE

Japan International Cooperation Agency (JICA) decided to conduct the preparatory survey and entrust the survey to Yachiyo Engineering Co., Ltd.

The survey team held a series of discussions with the officials concerned of the Government of the Islamic Republic of Pakistan, and conducted field investigations. As a result of further studies in Japan, the present report was finalized.

I hope that this report will contribute to the promotion of the project and to the enhancement of friendly relations between our two countries.

Finally, I wish to express my sincere appreciation to the officials concerned of the Government of Pakistan for their close cooperation extended to the survey team.

May, 2012

Atsufumi KONISHI
Director General,
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Japan International Cooperation Agency

SUMMARY

① Overview of Pakistan

The Islamic Republic of Pakistan (hereafter referred to as Pakistan) is located in the northwest part of the Indian Peninsula with a national land area of 796,000 square kilometers, and it is a federal republic possessing a population of roughly 170 million. Six out of ten population lives in rural areas, where the main industries and agriculture and textiles. In terms of GDP share (fiscal 2009), primary industries account for 21.2 percent, secondary industries for 26.4 percent and tertiary industries for 52.4 percent. Per capita national income is US$1,254 (fiscal 2011), however, the unemployment rate is 5.0 percent (fiscal 2008) and people living in poverty account for 22.3 percent of total population (fiscal 2006).

Pakistan has four main ethnic groups, namely Punjabis, Sindhis, Pashtuns and Balochis, as well as numerous other ethnic minorities. Each ethnic group has its own language, so the main languages of Pakistan are Punjabi, Sindhi, Pashtun, Balochi and Seraiki, however, the national language is Urdhu and the official language is English.

The inclusion of various ethnic groups in Pakistan has influenced on foreign policy since becoming independent. The boundary line known as the Durand Line that was drawn by the British at the end of the 19th century and split the Pashtun people today constitutes the national boundary with Afghanistan and incudes the present Khyber Pakhtunkhwa (hereafter referred to as KP) and Federally Administered Tribal Areas (hereafter referred to as FATA). Since Pashtuns account for approximately 15 percent of the population of Pakistan and 42 percent of the population of Afghanistan, this national boundary exerts an impact on foreign policy as an issue related to the integration of Pashtuns. Moreover, as a tribal region on the border with Afghanistan, a part of FATA is said to be a hotbed of activities by organized militias. Even today, FATA is home to various forces and institutions, and it is also an impoverished area with socioeconomic indicators at levels below the national average.

② Background and Outline of the Project

The Government of Pakistan has compiled Vision 2030, which constitutes seven national goals to be achieved by 2030. It has also adopted the Millennium Development Goals, in which it has set specific numeric targets to be realized by 2015 in view of the country's socioeconomic situation. The role of the PBC within Vision 2030 and the Millennium Development Goals is to widely broadcast education, information, enlightenment activities and culture to the national people and link this to the national wellbeing. Particularly in mountainous areas, because the poverty rate is higher than in the cities and the spread of medical care facilities and education agencies has been slow, the improvement of the broadcasting sector will help enhance administrative services in the areas of education, information and culture and contribute to the achievement of national development plans.

Furthermore, ever since the 9-11 terrorist attacks on the United States in 2001, the border region

between Afghanistan and Pakistan has become increasingly important for the stable development of both these countries. Stabilization of the border region including KP and FATA is a vital issue that impacts stability of the entire region, and it has also been designated as a priority issue in Japan's project deployment program for Pakistan and the New Strategy for Dealing with the Threat of Terrorism (2009) that was announced by the Government of Japan in November 2009.

The medium wave radio transmitter (made in the former Yugoslavia in 1974) at Faqirabad Transmitting Station in Punjab Province on the border with KP is supposed to cover the entire area of KP and FATA, however, its actual coverage in 2010 was less than 50 percent of this and broadcasting times have been badly curtailed from the intended 22 hours a day to 5 hours a day. Moreover, at PBC Headquarters in Islamabad, which is the center for producing programs for national broadcasting, studio equipment and master control equipment (made in Japan in 1970) used for transmitting programs throughout the country suffer from severe deterioration. Furthermore, production of main parts has been discontinued and it is difficult to acquire replacement parts for maintenance work. Against such a background, PBC made the request for grant aid aimed specifically at replacement of equipment at both Faqirabad Transmitting Station and PBC Headquarters with a view to providing broadcasting coverage over the entire area of KP and FATA.

③ Outline of the Survey Findings and Contents of the Project

Based on the above-mentioned preliminary survey, the Japanese Government decided to implement the preparatory survey and consigned JICA to dispatch the survey team to Pakistan from October 12 to November 4, 2011 in order to confirm the contents of the request and discuss the contents of implementation with the Pakistani counterparts. At the same time, the team investigated the Project sites and collected relevant materials. On returning to Japan, based on the materials collected in Pakistan, the survey team examined the necessity, socioeconomic effect and validity of the Project and compiled findings into the draft preparatory report. JICA dispatched the survey team to explain the draft preparatory report to the Pakistani side from February 27 to March 9, 2012, and the survey team held a series of discussions with the officials concerned of the government of Pakistan reached a basic agreement with the Pakistani side.

Concerning the contents of the request, originally concerns were raised over replacement of the existing antenna (approximately 259 m), however, as a result of conducting structural and electrical measurements, it was decided not to include replacement of the existing antenna in the Project on the proviso that the Pakistani side will implement repairs of the supports of some of the feeder lines that send signals from the transmitting station to the antenna. Also, out of the three production studios targeted for replacement in PBC Headquarters, one has been omitted. In addition, it has been decided to exclude STL from the Project due to technical difficulties in application, and rather to adopt telephone lines (ISDN Codec), while other measuring instruments have also been revised from the viewpoint of technical necessity. After above survey on the technical validity of the requested contents, the scope of works by the Japanese side has been

amended to the contents shown as follow.

Table Contents of the Assistance

	Description	Q'ty
I.	Faqirabad Transmitting Station	
1.	500kW MW Transmitter (250 kW+250 kW Combined system)	1 Set
2.	Auxiliary Equipment	1 Set
3.	Spare Parts	1 Set
4.	Measuring equipment and maintenance tools	1 Set
5.	ISDN Codec (1 Link : Islamabad Headquarters→ Faqirabad Transmitting Station)	1 Set
6.	Installation Work & Installation Materials	1 Set
II.	PBC Islamabad Headquarters	
1.	On Air Studio System	2 Sets
2.	Production Studio System	2 Sets
3.	Editing System	1 Set
4.	Master Control System	1 Set
5.	Installation Work & Installation Materials	1 Set

④ Project period and cost estimation

The responsible agency for the Project is the Ministry of Information and Broadcasting, and the implementing agency is PBC. Concerning the necessary equipment procurement period, approximately 16 months including the installation period is projected. The project cost to be borne by the Pakistani side is estimated to be 81 million yen.

⑤ Project Evaluation

- **Relevance**

  Since the area of coverage following replacement of equipment will include KP, FATA and areas on the Afghanistan side, the Project will contribute towards the stabilization of the Afghanistan border. Furthermore, these border areas are priority areas within Japan's Pakistan project deployment program and the New Strategy for Dealing with the Threat of Terrorism (2009). Meanwhile, since the equipment replacement will enable programs to be produced and broadcast for the entire area of Pakistan, the Project will contribute towards improving the daily lives of citizens. Furthermore, the role of PBC in widely broadcasting education, information, enlightenment activities and culture is important for realizing the goals of Vision 2030 and the Millennium Development Goals. Accordingly, the project is deemed to have a high degree of relevance for implementation.

- **Effectiveness**

(1) Quantitative effects

The transmitting power will recover and each spare part will increase in durability after replacement of the equipment in Faqirabad Transmitting Station. It will realize long hours broadcasting though the hour of broadcasting has recently been only five hours.

Hours worked of editing will be abbreviated after the equipment of studios and master control room in Islamabad Headquarters transition from an analog to digital. This will make editing works more efficient and increase numbers of program. Therefore following effectiveness will be expected.

1) Increasing number of listeners in the coverage area

In the case where transmitting power of Faqirabad Transmitting Station is increased from the present 150 kW to 500 kW following replacement of equipment, the reception field strength of 60 dBμ(V/m) that is anticipated based on ITU-R data will expand from the present 240 km to 300 km. Moreover, 60 dBμ(V/m) indicates the strength of radio waves that can be clearly heard without any noise. Coverage of the reference value is based on measured data of 2011.

Number of listeners in Pakistan who can receive the radio will increase with expansion of the coverage area. On the other hand, number of listeners in Afghanistan is expected approximately 3.5 million people.

Concerning the target value, improved coverage has been calculated based on ITU-R data. The coverage as the reference value has been calculated from the actual data in 2011. The number of listeners has calculated from these coverage and quoting population data from the Pakistan Statistical Year Book 2011 and Afghanistan Statistical Year Book 2010-2011.

Indicator	Reference Value (2011)	Target Value (2015)
Number of listeners	Approx. 36 million people	Approx. 64 million people

*the both estimated population is only for Pakistani side excluding Afghanistan side.

2) Broadcasting time

As the reference value, the daily broadcasting time in 2011 of five hours will be adopted, while the 14 hours per day that was requested by PBC will be adopted as the target value following equipment renewal.

Indicator	Reference Value (2011)	Target Value (2015)
Broadcasting time	5 hours/day	14 hours/day

(2) Qualitative Effects (overall Project)

It is expected to be a stable transmission and expansion of coverage areas including KP and FATA after the transmitters are replaced and spare parts is possible to be procured in Faqirabad Transmitting Station. Replacement of studios equipment in Islamabad Headquarters will make possible the long hours broadcasting as well as improvement of sound quality and efficient of recording and editing because of transition from an analog to digital. This will thereby realize

efficient of program and enhancing contents of program.

PBC will possible to produce recording program which needs works of recording and editing. For instance, news show is the program focused on a crime scene or person who is much talked about, and feature program is the program which describes and discusses a social issue. Quality of programs will be improved as a media due to providing a wide variety of program services.

Therefore both improvement of program quantity and expansion of coverage including KP and FATA will contribute not only improving quality of life in Pakistani but also stabilization of regional community in Pakistan.

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Abbreviations

A/P	Authorization to Pay
APP	Associated Press of Pakistan
AVR	Automatic Voltage Regulator
CDWP	The Central Development Working Party
CIDA	Canadian International Development Agency
DFID	Department for International Development
DWA	Deutsche Welle
EAD	Economic Affairs Division
ECNEC	Executive Committee of National Economic Council
E/N	Exchange of Notes
FATA	Federally Administered Tribal Areas
GDP	Gross Domestic Product
GPS	Global Positioning System
IESCO	Islamabad Electric Supply Company
ISDN	Integrated Services Digital Network
JICA	Japan International Cooperation Agency
JIS	Japanese Industrial Standards
KP	Khyber Pakhtunkhwa
NBS	National Broadcasting Service
NGO	Non-Governmental Organization
NHU	National Hook Up
OJT	On the Job Training
PBC	Pakistan Broadcasting Corporation
PEMRA	Pakistan Electronic Media Regulatory Authority
PKR	Pakistan Rupee
PTV	Pakistan Television Corporation
USAID	United States Agency for International Development
VAT	Value Added Tax

Chapter 1 Background of the Project

1-1 Background and Outline of the Project

Ever since the 9-11 terrorist attacks on the United States in 2001, the border region between Afghanistan and the Islamic Republic of Pakistan (hereafter referred to as Pakistan) has become increasingly important for the stable development of both these countries. In Khyber Pakhtunkhwa (hereafter referred to as KP) and Federally Administered Tribal Areas (hereafter referred to as FATA), socioeconomic indicators are below the national average, while repeated clashes between armed militias and government forces and natural disasters such as flooding and so on have added to the confusion in recent years. Based on the understanding that stabilization of the border region including KP and FATA is a vital issue that impacts stability of the entire region, and it has also been designated as a priority issue in Japan's project deployment program for Pakistan and the New Strategy for Dealing with the Threat of Terrorism (2009) that was announced by the Government of Japan in November 2009.

Concerning access to information, according to United Nations statistics (2007), radio is the most commonly used source of information in these two areas. In addition to education and enlightenment, information related to daily lifestyle such as public health, weather, disaster prevention and public order, radio plays a major role in disseminating information related to humanitarian support (information on rationed supplies of food, daily necessities and building materials, etc.) for internally displaced people and refugees from Afghanistan.

Radio broadcasting in Pakistan has the capacity to reach 98 percent of the population and 78 percent of the national land area via 26 medium wave radio transmitting stations owned by Pakistan Broadcasting Corporation (hereafter referred to as PBC) throughout the country, however, the broadcasting coverage rate is declining every year due to the degradation over time of transmitters.

Of these, the medium wave radio transmitter (made in Yugoslavia in 1974) at Faqirabad Transmitting Station in Punjab Province on the border with KP is supposed to cover the entire area of KP and FATA, however, its functions have been badly curtailed, for example, its actual coverage in 2010 was less than 50 percent of intended coverage and broadcasting times have been curtailed from the intended 22 hours a day to 5 hours a day. Moreover, at PBC Headquarters in Islamabad, which is the center for producing programs for national broadcasting, studio equipment and master control equipment (made in Japan in 1970) used for transmitting programs throughout the country are suffering from severe deterioration. Also, production of the major parts was curtailed 10 years ago and it has become difficult to acquire replacement parts for maintenance work.

Against such a background, in 2010 the PBC made the request to the Government of Japan for grant aid, namely the Preparatory Survey on the Medium Wave Radio Broadcasting Network Rehabilitation Project in Pakistan, aimed specifically at renewing equipment at Faqirabad Transmitting Station and at PBC Headquarters in Islamabad.

Through carrying out the renewal of such equipment, since it will become possible to provide

broadcasting coverage over the entire area of KP and FATA, the preparatory survey will be implemented in response to the request.

1-2 Natural Conditions

1-2-1 General Conditions

Faqirabad Transmitting Station is located in Kamra District, Attock Division, Punjab Province at an altitude of 300 meters. According to records of the Pakistan Meteorological Department, 11 earthquakes with magnitudes ranging from 3.0 to 5.2 have been recorded since 1962 in Attack.

1-2-2 Meteorological Conditions

The climate in the Project site of Faqirabad, Attock Division is a temperate wet summer climate characterized by heavy rain, high temperatures and high humidity in the summer and dry winters. Table 1-2-1 shows weather conditions on the Project site in 2009 and 2010. Table 1-2-2 shows number of days of thunder and lightning at the Project site in 2009 and 2010.

Table 1-2-1 Temperature, Rainfall and Wind Velocity in the Project Target Site of Faqirabad
(mean values in 2009 and 2010)

2009		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum temperature	℃	17.5	19.5	24.7	29.3	39.7	38.9	40.4	37.5	36.0	31.8	24.7	19.7
Minimum temperature	℃	4.3	6.0	9.1	14.5	19.6	22.4	26.5	26.1	22.3	13.7	6.0	1.7
Humidity	%	58	52	48	57	37	32	44	61	59	53	61	55
Total rainfall	mm	56.0	75.0	63.0	85.0	9.0	5.0	89.0	169.0	44.0	4.0	11.0	0.0
Wind velocity	m/s	6.7	11.1	8.1	14.4	15.7	17.6	Nill	11.3	11.1	6.1	4.6	3.1

2010		Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec
Maximum temperature	℃	19.9	18.6	28.4	33.4	38.1	39.8	38.1	33.7	33.9	31.6	25.8	17.7
Minimum temperature	℃	1.0	6.2	12.7	17.2	21.3	23.6	26.6	25.2	22.0	16.6	7.3	0.2
Humidity	%	55	70	61	47	36	34	52	76	63	60	66	76
Total rainfall	mm	14.0	143.0	42.0	7.0	15.0	48.0	517.0	364.0	32.0	1.0	0.0	7.0
Wind velocity	m/s	5.2	8.5	7.4	4.2	4.2	4.0	9.6	1.9	2.7	3.0	3.0	3.2

※ Marks indicate maximum values.

(Source: Prepared by the survey team based on data from the Ministry of Defence and Pakistan Meteorological Department)

Table 1-2-2 Days of Thunder and Lightning in the Project Target Site at Faqirabad (2009, 2010)

	2009	2010
January	4 days	1 day
February	4 days	6 days
March	3 days	5 days
April	6 days	7 days
May	13 days	9 days
June	9 days	12 days
July	9 days	9 days
August	14 days	15 days
September	5 days	8 days
October	1 day	4 days
November	2 days	NIL
December	NIL	NIL

(Source: Prepared by the survey team based on data from Pakistan Meteorological Department, the Ministry of Defence.)

Chapter 2 Contents of the Project

2-1 Basic Concept of the Project

2-1-1 Superior Objective and Project Goal

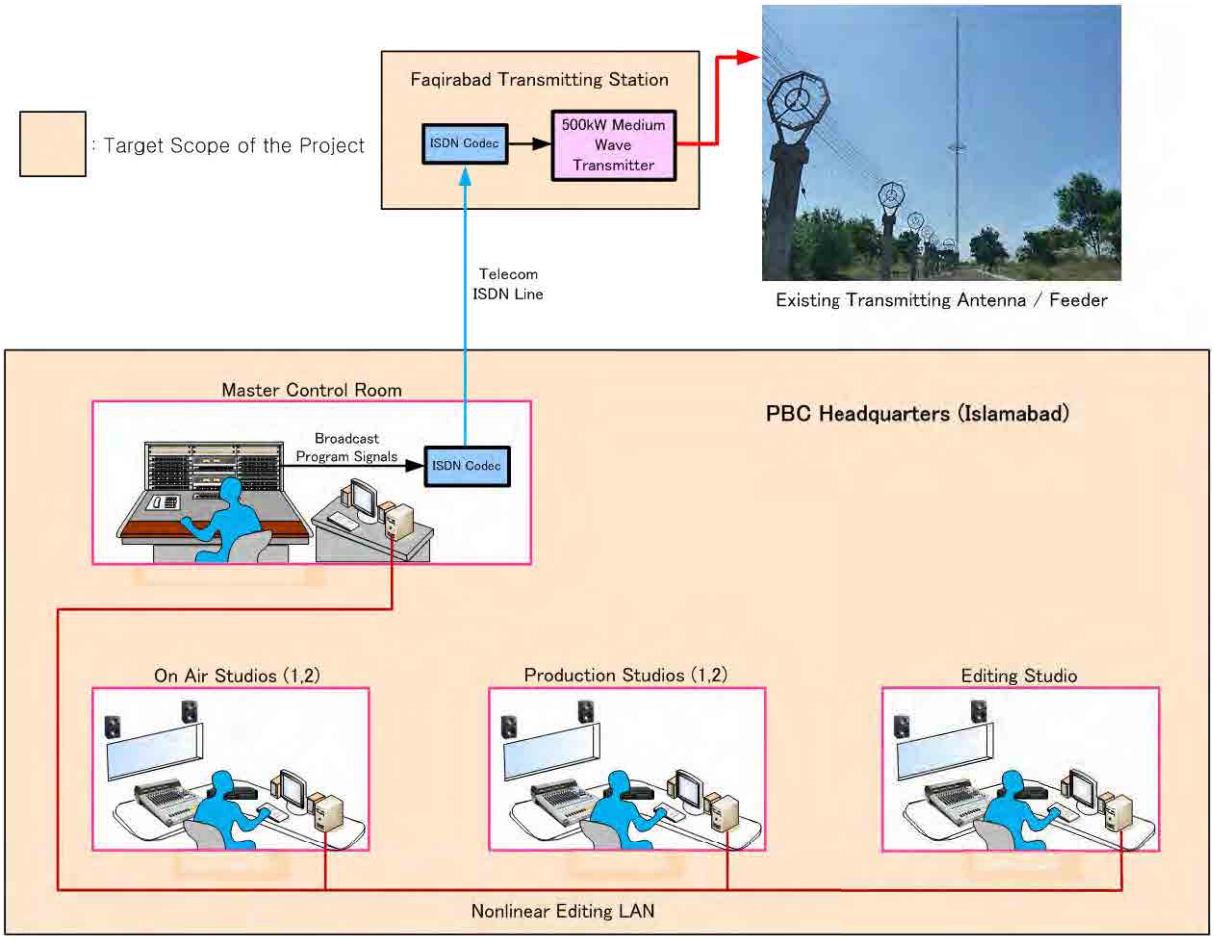
Stabilization of the border areas including KP and FATA is a vital issue that impacts stability of the entire region, and it has also been designated as a priority issue in Japan's project deployment program for Pakistan and the New Strategy for Dealing with the Threat of Terrorism (2009) that was announced by the Government of Japan in November 2009.

Through enabling the provision of information concerning daily living and humanitarian assistance across the entire country of Pakistan, the superior objective is to socially and economically improve the daily lives of citizens. Within this, the Project goal is to provide stable radio broadcasting services to the entire area of KP and FATA.

2-1-2 Outline of the Project

The project will implement replacement of the transmitters and necessary equipment in Faqirabad Transmitting Station and the studio system equipment in Islamabad Headquarters in order to achieve the above goal. This will be expected to provide KP and FATA with stable radio broadcasting service. In this context, the work of Japanese side will procure the MW transmitters, Onair studio systems, Editing studio system, Production studio systems and Master control room system.

Figure2-1-1 is shown the image of the equipment contents in the project and Table2-1-1 will be shown the project component.



(Source: Prepared by the survey team)

Figure 2-1-1 Image of Equipment Contents in the Project

Table 2-1-1 Project Component

	Description	Q'ty
I.	Faqirabad Transmitting Station	
1.	500kW MW Transmitter (250 kW+250 kW Combining)	1 Set
2.	Auxiliary Equipment (Dummy Load, PIE, Control Panel, 11kV Transformer, Air Conditioner, etc)	1 Set
3.	Spare Parts	1 Set
4.	Measuring Equipment for Maintenance	1 Set
5.	ISDN Codec (1Link : Islamabad – Faqirabad, Main and Standby)	1 Set
6.	Installation Work & Installation Materials	1 Set
II.	PBC Headquarter	
1.	On Air Studio System	2 Set
2.	Production Studio System	2 Set
3.	Editing System	1 Set
4.	Master Control System	1 Set
5.	Installation Work & Installation Materials	1 Set

2-2 Outline Design of the Japanese Assistance

2-2-1 Design Policy

2-2-1-1 Basic Policy

A survey of the overall situation at all broadcasting stations and survey of the conditions of equipment will be simultaneously implemented and the contents will be planned so that only the most effective and minimum necessary equipment is procured. The following perspectives will be incorporated into the design.

(1) Transition to Solid State Transmitters

Conventional transmitters including those already installed are the vacuum type and require replacement of vacuum tubes due to aged deterioration (36 years), however, because such parts (made in the former Soviet Union) are no longer in production, it is impossible to conduct maintenance. Moreover, due to the structure of components, vacuum tube transmitters are not as reliable as solid state transmitters that use the latest semiconductors, and transmitter performance gradually declines as the vacuum tube gets older. For this reason, vacuum type transmitters are gradually being phased out as equipment upgrades are made. In recent years, solid state transmitters have become the main type. Compared to vacuum tube types, solid state transmitters have the advantages described below.

1) High reliability and long life

Since vacuum tube heaters and cathodes, etc. deteriorate over time, it is necessary to periodically exchange the vacuum tubes. In comparison, since the transistors of solid state transmitters display hardly any degradation over time, there is no need for periodic exchange and service life is longer.

2) Ease of Maintenance Work

Since solid state transmitters are composed of multiple units, in cases of failure, transmitting (at reduced power) can be continued even when the problem units are removed; moreover, restoration can be achieved in a short time because it is only necessary to replace units.

3) Low Power Consumption

The solid state transmitters have approximately 40 percent less power consumption and higher efficiency than vacuum tube transmitters at 100 percent modulation.

(2) Transmitting Power

Figure 2-2-1 is shown coverage of the project which was calculated from ITU-R data based on the data of field strength measuring. The survey team has confirmed that medium wave signal of 60 dBμ (V/m) can reach around the border between Pakistan and Afghanistan including KP

and FATA although the MW signal had not recently reached there. 60 dBμ (V/m) defines the signal which people can listen clearly without any noise. Moreover, the coverage has been compared between transmitting power 500kW of the project and 1000kW of previous days in 70's. As a result of comparing, expansion of coverage increases out of proportion to increasing amount of consumption power of a transmitter and transmitting power. The survey team thereby concluded that 500kW has a high degree of relevance for rated power of transmitter in the project.

(Source: Prepared by the survey team)

Figure 2-2-1 Coverage map of the Project

2-2-1-2 Policy regarding Procurement Conditions Including Third Countries

The medium wave transmitter system, studio system, master control room system and other main equipment to be procured and installed in the Project are not manufactured in Pakistan. The existing equipment was originally procured from the former Soviet Union, the United States, the United Kingdom and European countries, however, not many manufacturers have the post-sales service setups to respond to accidents and repairs and procure spare parts and so on. In the discussions with PBC, the local side expressed a desire for Japanese products, which have better durability than products from third countries.

Moreover, upon confirming the operating state of existing equipment at the targeted transmitting station, it was found that the existing transmitters made in the former Soviet Union have been in use for 36 years, their output has declined to 150 kW and their coverage is also impeded. Although the transmitters can still be used over the short term, it is more effective to take the opportunity of the Project to replace the transmitters with transistor models. Moreover, PBC is used to the operation and maintenance techniques for Japanese FM transmitters and other instruments, and it trusts the Japanese reputation for few breakdowns and sound post-sales service. However, aside from the wishes of the Pakistani side, since it is necessary to pursue low prices and secure competition in the grant aid scheme, potential suppliers will also be considered from the United States and Europe too. Also, in order to stabilize operation and maintenance befitting of a state broadcaster that has a major social responsibility, equipment including third country products will be consolidated into the same Japanese maker, which will conduct system compatibility testing and establish the setup for securing overall system performance

2-2-1-3 Policy regarding Equipment Grades

Broadcasting equipment is broadly divided into that for civilian use, that for professional use and that for broadcasting station use. Equipment for broadcasting station use is expensive because it is designed with a view to ensuring continuous operation, reducing failures and realizing a high degree of reliability and redundancy in circuitry. In the Project, equipment will be selected from that for broadcasting station use.

2-2-1-4 Policy regarding Procurement Method and Works Period

Equipment procured in Japan or third countries will primarily be transported to Pakistan by ocean shipping. The port of landing in Pakistan will be Karachi Port, from where the equipment will be transferred to containers and transported by truck to the Project site. Transportation from Japan (including third countries) to the product site by this method will take around two months.

2-2-2 Basic Plan

The medium wave radio transmiting station equipment in the Project basically represents functional upgrading of existing equipment. Through upgrading the equipment, medium wave radio broadcasts will be maintained, coverage will be extended and information of daily living and humanitarian

supportwill be transmitted to listeners in the covered area, in particular KP and FATA.

2-2-2-1 Power Supply and Air Conditioning Equipment

(1) Power Supply Equipment

The Survey Team carried out measurement of power-supply voltage that is supplied to the existing transmitters and other broadcasting equipment from the city grid or emergency generator via automatic voltage regulator (AVR) at Faqirabad Transmitting Station.

Faqirabad Transmitting Station

Measurement period:	From 11:00 on 20th Oct. until 11:00 on 21st Oct 2011.
Measurement location:	Control room
Results:	See Figure 2-2-2
Observations:	According to the measurement results, the supply voltage to broadcasting devices was around 243 V on average at the normal, however, short power interruptions were sometimes observed. It was seemed that these power interruptions occur at times of transformer tap switching in the substation. The new equipment to be procured in the Project is designed with rated voltage of 400/230 V. For operating normally and safely such equipment, it is necessary to adjust and maintain voltage around the abovementioned rated voltage ±10%. However, it is difficult for the current city power supply and AVR to supply power to the transmitting station while keeping voltage in the normal operating range. Accordingly, the Survey Team plans to add an AVR with capacity that corresponds to the amount of power consumption by the abovementioned new equipment.

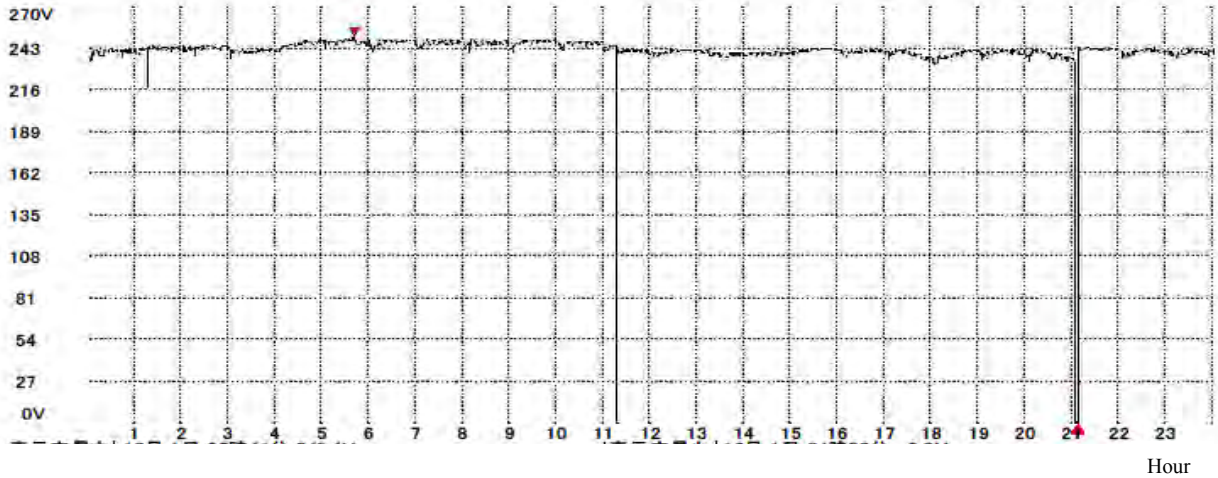


Figure 2-2-2 Faqirabad Transmitting Station Voltage Measurement Results

(2) Air Conditioning Equipment

Broadcasting equipment comprises precision instruments and an appropriate air conditioning system is needed in order to prevent condensation occurring due to sudden changes in the room temperature and humidity. The survey team conducted measurements under the following conditions using a digital measuring device capable of recording changes in indoor and outside temperature and humidity over an extended period with a view to ascertaining the operating capacity and effectiveness of existing air conditioning equipment.

Faqirabad Transmitting Station

Measurement period:	From 11:00 on 20th Oct. until 11:00 on 21st Oct 2011.
Measurement location:	① Transmitter room: See Figure 2-2-3
	② Control room results: See Figure 2-2-4
Observations:	As a result of measurement, temperature at each location was generally found to fluctuate in the range of 23°C to 26°C, however, there were no sudden temperature increases or extended high temperature conditions due to the heat generated by broadcasting equipment, etc.

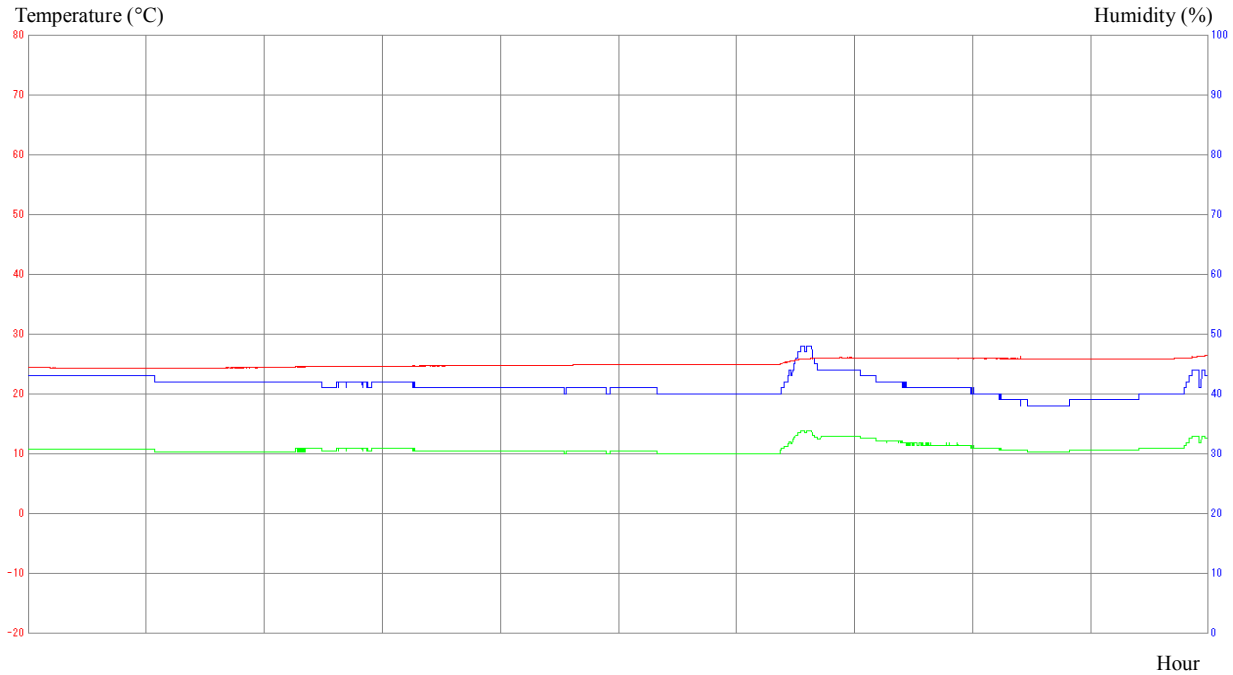


Figure 2-2-3 Faqirabad Transmitting Station: Temperature (red), Humidity (blue) and Condensation (green) in Transmitting Room

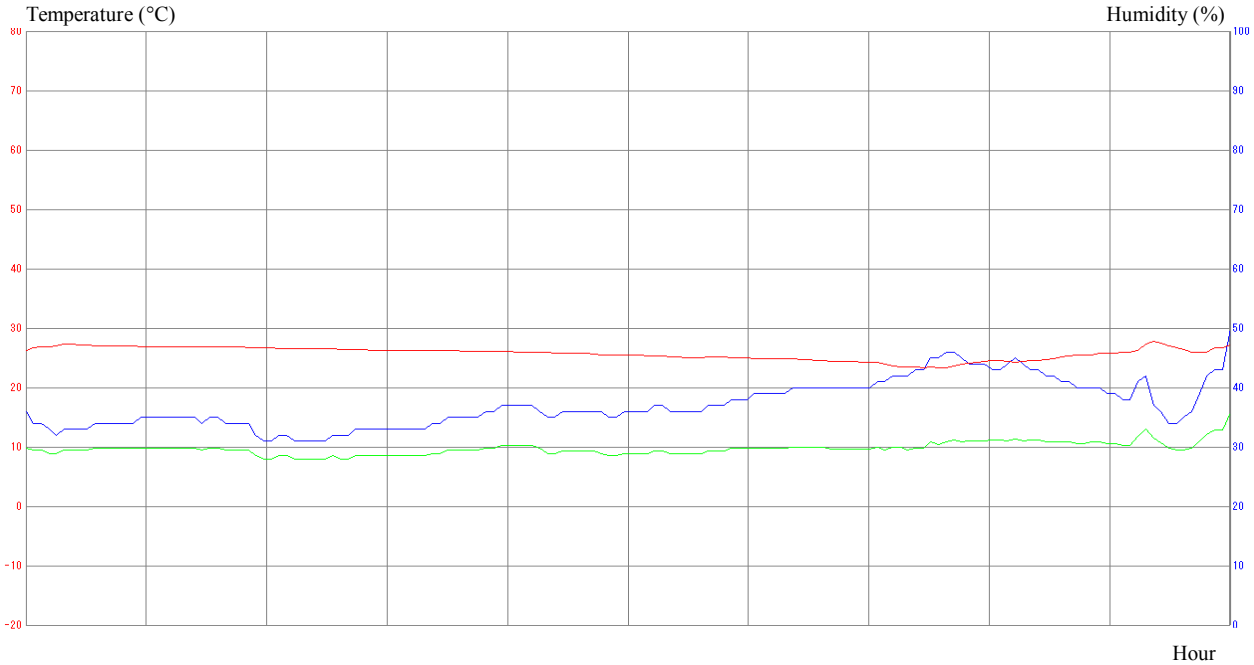


Figure 2-2-4 Faqirabad Transmitting Station: Temperature (red), Humidity (blue) and Condensation (green) in Transmitting Room

2-2-2-2 Programming Plan for PBC Faqirabad Transmitting Station

(1) Purpose of Programming

In Pakistan, whereas the national language is Urdhu and the official language is English, there are numerous other languages such as Pashto and Balochi, while the mean nationwide literacy rate is less than 40 percent (Pakistan Statistical Year Book 2011). Accordingly, it is estimated that multilingual radio broadcasts are vital media for conveying important information. In particular, because mountainous land constitutes part of the national land area, medium wave radio can play an important role in view of its characteristics. Accordingly, following the installation work at Faqirabad Transmitting Station, the programming plan indicated below will be compiled so that information can be provided to a diverse variety of citizens.

(2) Program Schedule (draft)

Following implementation of the Project, the contents of programs planned for broadcasting by PBC from Faqirabad Transmitting Station are as follows.

Table 2-2-1 Program Outline in Faqirabad (Draft)

Hours		Program	Description	Used language
Morning Transmission	0700 0800	RANRA	(Educational Program) It will be a religious program that will convey the teachings of Islam. In this program. talks and interviews of renowned scholars and academicians based on peace & love, patience & tolerance and respect for others with recitation items & spiritual music will be aired	Pashto
	0800 0900	PALWASHAY	(Social Awareness Program) To enlighten the people living in FATA about the developmental projects, their benefits and also to educate them about the health, protection of environment and social issues.	Pashto
	0900 1000	ZAMONG DUNYA	(Women Program) This part of the segment will be based on educational, health, legal, social economic and psychological problems of women and their solutions	Pashto
	1000 1100	APPKAY NAAM	(Music Program) This will basically be an entertainment program and will include Music, Skits, Radio Columns etc.	Urdu
Day Transmission	1100 1200	PASAND APP KI	(Entertainment Program) The entertainment program of music will be based on listeners' requests and letters.	Punjabi/ Potohari
	1200 1300	INTIKHAB	(Cultural Program) The program will based on the selected items from central productions' sound archives of Radio Pakistan and convey the message of peace and tranquility as well.	Urdu
Break				
Day Transmission	1400 1500	TUSAN NAY NAL NAL	(Educational Program) The program will be in Hindiko Language which is spoken and understood in Punjab as well as many parts of KP. The program will highlight educational, health, social and economic issues with light chat mixed with folk songs, Mahiyas, Char Baitas and She Harges etc.	Hindoko
	1500 1600	KEHWA KHANA	(Cultural Program) Domestic affairs experts will discuss education, health, sanitation and environmental issues and government development projects.	Hindoko
	1600 1700	SEHAT DULAT DAY	(Health) In Pakistan, because information on health issues is lacking in some areas, there are many people who fall into poor health. Accordingly, doctors who specialize in common diseases in Pakistan will be invited to discuss issues.	Pashto
Evening Transmission	1700 1800	HUJRA	(Local information) Issues that are of interest in the Pashtun area, for example, education, health, environmental problems, law, handicraft industries and terror problems, etc., will be raised. Also, since agriculture is such an important sector here, issues related to farming will be discussed.	Pashto
	1800 1900	SEHAT KI DAULAT	(Health Program) The program will be invited specialist doctors to highlight the basic symptoms of different diseases, preventive and other precautionary measures	Urdu
	1900 2000	RANGUNA	(Entertainment) This will request music requested by listeners in the northern province of Gilgit. It will also deal with issues related to health, environment, education and terrorism, etc.	Shina

Hours		Program	Description	Used language
	2000 2100	BALTISTAN CALLING	(Health Program) The program will be a radio show in which topics pertaining to the interests and achievements of the all generations belonging to Gilgit Baltistan and adjacent areas will be covered.	Balti
	2100 2200	Baazgasht	(Information Program) The program will cover activities and important national and international events of the whole day, news and commentaries will also be broadcast.	Urdu

(Source: PBC)

2-2-2-3 Studio Plan

(1) Relevance of the Quantity of Studios

A mission of public broadcast including Japan's one is generally to contribute to the enhancement of public welfare and culture, prosperity of industry and economy and realization of a peaceful society. In addition to policy broadcasts, it is necessary to achieve balanced and fair broadcasting that comprises accurate and prompt news programs and education programs, sound entertainment programs. The radio broadcasts targeted in the Project are primarily intended to offer a diverse selection of contents to listeners. Accordingly, it will be necessary to prepare the minimum required studio audio equipment to ensure diverse program production and reliable maintenance and so on.

As of 2011, the transmitter at Faqirabad Transmitting Station is operating with transmission power curtailed from 500 kW to 150 kW and its daily broadcasting time is limited to just five hours in the morning. Accordingly, coverage and broadcast contents are limited, however, following implementation of the Project, it is planned to recommence broadcasts of 14 hours per day as indicated in the request. Based on the program schedule for Faqirabad Transmitting Station indicated in Table 2-2-1, Table 2-2-2 shows the contents and times of programs.

Table 2-2-2 Faqirabad Transmitting Station Program Schedule (1 day)

Educational broadcasts	6h
News specials	1h
News	2h
Traditional music and entertainment	3h
Religion	1h
Information	1h
Total time (per day)	14h

(Source: prepared by the survey team based on data from PBC)

Based on the results of both calculating the necessary studio usage time for on-air, rehearsal, recording and editing that is necessary for program production, the results of calculating the time ratio for studio maintenance and repeat broadcasts are as indicated in Table 2-2-3. There is some bias towards the usage times of the studio and editing room, however, the shortfall in

studio usage time has been remedied by incorporating functions for supplementing from other studios via audio networking and so on.

Moreover, the existing PBC studio equipment was installed around the same time as the transmitter, and Japanese products are numerously used for audio instruments and so on. Modern audio instruments mainly comprise networked systems that integrate the functions of editing, recording and sending-out thanks to advances in the versatility of computer technologies. However, PBC studio equipment mainly comprises equipment that is more than 40 years old and almost all equipment is analog. Meanwhile, USAID is building archives through recording and storing music resources onto large-capacity memory media and it expects to complete this work in 2012. In the Project, it will be necessary to construct a system that enables network utilization within the station.

Meanwhile, master control room equipment in the Project will basically be maintenance-free, but any unexpected failures will be addressed through replacing parts. Accordingly, the minimum spare parts for handling situations until the further procurement of parts will be provided. In addition, work will be started on switching the studios in the Islamabad headquarters from analog sound sources to digital. In line with this, since it will be necessary to digitally play and edit past sound sources (archives), it has been decided to include 200 cassette tapes and 300 CDs as minimum required media in the Project. PBC will need to secure the budget to purchase the required quantities of media from the next fiscal year after completion.

Table 2-2-3 shows the contents and broadcasting times of programs and the length of time spent using equipment.

Table 2-2-3 Program Contents and Equipment Operating Times

Type of program		Broadcasting hours per day	Hours of equipment use per hour of program broadcast				
			①S-1 On-air studio	②S-2 On-air studio	③S-3 Program production studio	④S-7 Program production studio	⑤Editing studio
a	Education	6h	Live broadcast x 1＝6h		Recorded broadcast x 5 ＝30h		4＝24h
b	Special news	1h				Recorded broadcast x 4 ＝4h Live broadcast x 1＝1h	
c	News	2h	Live broadcast x 1.5＝3h			Recorded broadcast x 4 ＝8h	×4＝8h
	Sports						
d	Traditional music and entertainment	3h		Live broadcast x 1.5＝4.5h	Recorded broadcast ×5 ＝15h		×4＝12h

Type of program		Broadcasting hours per day	Hours of equipment use per hour of program broadcast				
			①S-1 On-air studio	②S-2 On-air studio	③S-3 Program production studio	④S-7 Program production studio	⑤Editing studio
	Religion	1h	Live broadcast x 1＝1h			Live broadcast x 2＝2h	
f	Information	1h		Live broadcast x 1 ＝1h			
	Total (per day)	14h	10h	5.5h	45h	15h	44h
	Correction of usage time (Note 1)		7h	3.85h	31.5h	10.5h	30.8h
	(Note 1) Assuming that repeat broadcasts account for 50 percent of the total and maintenance, etc. for 20 percent, the corrected usage time will be -30 percent.						

Based on the daily operating times that were obtained in Table 2-2-1, Table 2-2-3 shows the desirable amounts of equipment that will be required in the Project. Concerning editing resources, a desktop audio network will be used to compile the program audio resources into a single program. Also, concerning the elements that are used for more than 24 hours under ③ S-3 program production studio and ⑤ editing studio, adjustments will be made utilizing ① S-1 on-air studio and ②S-2 on-air studio respectively.

2-2-2-4 Equipment List

Table 2-2-4 gives a list of the broadcasting equipment targeted in the Project.

Table 2-2-4 Component of the Project Equipment

No.		Item	Quantity	
1		Faqirabad Transmitting Station	1	Set
	1-1	500kW medium wave transmitter (250 kW + 250 kW output combined set)	1	Set
	(1)	250kW medium wave transmitter	2	Set
	(2)	RF excitation unit	1	Set
	(3)	250 kW + 250 kW parallel combined unit	1	Set
	(4)	Absorption dummy device (for parallel combined unit)	1	Set
	(5)	Output impedance converter (50Ω→60Ω, 500 kW)	1	Set
	(6)	250 kW + 250 kW parallel combined unit control/display unit	1	Set
	1-2	500kW dummy load	1	Set
	1-3	Program inputting equipment rack (PIE)	1	Set
	(1)	Audio process amplifier	2	Set
	(2)	Control plate (input selection switch, meter panel, monitor selection switch)	1	Set
	(3)	Monitor amplifier	1	Set
	(4)	Monitor speaker	1	Set
	(5)	Broadcasting receiver and receiving antenna	1	Set

No.		Item	Quantity	
	(6)	Audio jack plate	1	Set
	(7)	NFB plate	1	Set
	(8)	Rack	1	Set
	1-4	Control console	1	Set
	1-5	11kV/400V receiving transformer	2	Set
	1-6	Insulating transformer (400V/400V)	2	Set
	1-7	Automatic voltage adjuster and distribution panel	2	Set
	1-8	Air conditioner (for control room)	2	Set
	1-9	Forced cooling system	1	Set
	(1)	Transmitter intake air filter and louver	2	Set
	(2)	Transmitter air exhaust duct	4	Set
	(3)	Transmitter air exhaust fan	4	Set
	(4)	Absorption dummy intake air filter and louver	1	Set
	(5)	Absorption dummy air exhaust louver	1	Set
	(6)	Fence for dummy load room	1	Set
	1-10	Program transmitting system (Islamabad Headquarters →Faqirabad Transmitting Station)	1	Set
	(1)	ISDN codec	2	Set
2		PBC Islamabad studio equipment	1	Set
	2-1	Onair studio systems	2	Set
		(Each set is composed of the following devices)		
	(1)	Digital audio mixer	1	Set
	(2)	CD player/recorder	1	Set
	(3)	Nonlinear editing system	1	Set
	(4)	Nonlinear editing software	1	Set
	(5)	Monitor speaker amp (2ch)	2	Set
	(6)	Monitor speaker (for operating room)	2	Set
	(7)	Monitor speaker (for studio wall hanging)	2	Set
	(8)	Pre-fader listening monitor speaker (with amp)	1	Set
	(9)	Headphones	6	Set
	(10)	Microphone and microphone stand	3	Set
	(11)	Telephone hybrid unit	1	Set
	(12)	Room interphone system and terminals	1	Set
	(13)	On Air display lamp	1	Set
	(14)	Microphone connector panel	1	Set
	(15)	Operating table	1	Set
	(16)	Uninterrupted power supply	1	Set
	(17)	Headphone amp	1	Set
	(18)	On air tally control unit	1	Set
	(19)	Studio monitor control unit	1	Set
	2-2	Production studio system	2	Set

No.		Item	Quantity	
		(Each set is composed of the following devices)		
	(1)	Digital audio mixer	1	Set
	(2)	CD player/recorder	1	Set
	(3)	Nonlinear editing system	1	Set
	(4)	Nonlinear editing software	1	Set
	(5)	Audio effects unit	1	Set
	(6)	Monitor speaker amp (2ch)	2	Set
	(7)	Monitor speaker (for operating room)	2	Set
	(8)	Monitor speaker (for studio wall hanging)	2	Set
	(9)	Pre-fader listening monitor speaker (with amp)	1	Set
	(10)	Headphones	6	Set
	(11)	Microphone and microphone stand	3	Set
	(12)	Telephone hybrid unit	1	Set
	(13)	Room interphone system and terminals	1	Set
	(14)	On Air display lamp	1	Set
	(15)	Microphone connector panel	1	Set
	(16)	Operating table	1	Set
	(17)	Uninterrupted power supply	1	Set
	(18)	Headphone amp	1	Set
	(19)	On air tally control unit	1	Set
	(20)	Studio monitor control unit	1	Set
	2-3	Editing studio system	1	Set
	(1)	Digital audio mixer	1	Set
	(2)	CD player/recorder	1	Set
	(3)	Cassette tape recorder	1	Set
	(4)	Nonlinear editing system	1	Set
	(5)	Nonlinear editing software	1	Set
	(6)	Monitor speaker amp (2ch)	2	Set
	(7)	Monitor speaker (for operating room)	2	Set
	(8)	Monitor speaker (for studio wall hanging)	2	Set
	(9)	Pre-fader listening monitor speaker (with amp)	1	Set
	(10)	Headphones	6	Set
	(11)	Microphone and microphone stand	3	Set
	(12)	Telephone hybrid unit	1	Set
	(13)	Room interphone system and terminals	1	Set
	(14)	On Air display lamp	1	Set
	(15)	Microphone connector panel	1	Set
	(16)	Operating table	1	Set
	(17)	Uninterrupted power supply	1	Set
	(18)	Headphone amp	1	Set
	(19)	On air tally control unit	1	Set

No.		Item	Quantity	
	(20)	Studio monitor control unit	1	Set
	2-4	Master control room system	1	Set
	(1)	Digital master control switcher	1	Set
	(2)	Limiter / Compressor	1	Set
	(3)	Analog-digital converter	1	Set
	(4)	Analog-digital converter for existing studios	15	Set
	(5)	Digital-analog converter	1	Set
	(6)	Digital-analog converter for existing studios	15	Set
	(7)	Audio distributing amplifier	1	Set
	(8)	Graphic equalizer	1	Set
	(9)	ISDN codec	2	Set
	(10)	Input signal monitor	1	Set
	(11)	Master control switcher input signal monitor control panel	1	Set
	(12)	Output signal monitor switcher (with VU meter and speaker)	1	Set
	(13)	Master control switcher output signal monitor control panel	1	Set
	(14)	Master control switcher on air control panel	1	Set
	(15)	On air output column VU meter panel	1	Set
	(16)	Master control switcher new studio column control panel	5	Set
	(17)	Master control switcher archive system column control panel	1	Set
	(18)	On air monitor receiver (with antenna and speaker)	1	Set
	(19)	Mono-stereo switching panel	1	Set
	(20)	Monitor speaker amp (2ch)	1	Set
	(21)	Main monitor speaker	2	Set
	(22)	Nonlinear editing system	1	Set
	-1	Nonlinear editing system	1	Set
	-2	Data server system	1	Set
	-3	HUB	1	Set
	(23)	Nonlinear editing software	1	Set
	(24)	Data server system software	1	Set
	(25)	Room interphone base unit and terminal units	1	Set
	(26)	Analog jack plate and patch cable	1	Set
	(27)	Digital jack plate and patch cable	1	Set
	(28)	Equipment rack	1	Set
	(29)	Control console	1	Set
	(30)	Uninterrupted power supply	1	Set
	(31)	Synchronized signal generating system	1	Set
	-1	Synchronized signal generator	2	Set
	-2	Changeover unit	1	Set
	-3	Signal distributor	1	Set
	2-5	Existing studio equipment	15	Set
		(Each set is composed of the following devices)	1	Set

No.		Item	Quantity	
	(1)	A/D, D/A mounting shelf board	1	Set
	(2)	Advance materials selection switcher control panel	1	Set
	(3)	Instrument mounting shelf board for the equipment in (1) and (2) above	1	Set
	(4)	Room interphone system and terminals	1	Set
	2-6	Clock unit	1	Set
	(1)	Master clock	1	Set
	(2)	Slave clock	6	Set
	(3)	GPS receiver	1	Set
	(4)	Time code distributor	1	Set
3		Measuring devices and maintenance tools	1	Set
	3-1	Measuring devices	1	Set
	(1)	Oscilloscope	1	Set
	(2)	Frequency meter	1	Set
	(3)	Tester	1	Set
	(4)	High voltage probe	1	Set
	3-2	Tool kit	1	Set
4		Replacement parts	1	Set
	(1)	Medium wave transmitter PA module (1 of each type)	1	Set
	(2)	PA module FET	1	Set
	(3)	Medium wave transmitter RF driver unit	1	Set
	(4)	Medium wave transmitter power supply module (1 of each type)	1	Set
	(5)	Medium wave transmitter control board	1	Set
	(6)	Medium wave transmitter monitor board	1	Set
	(7)	Automatic transformer and regulator control board	1	Set
	(8)	Feeder element	1	Set
5		Expendable parts	1	Set
	(1)	Medium wave transmitter fan unit	1	Set
	(2)	Medium wave transmitter air filter	1	Set
	(3)	Medium wave transmitter fuse	1	Set
	(4)	Insulating transformer surge absorber	1	Set
	(5)	Program inputting device fuse	1	Set
	(6)	Automtic voltage regulator fuse	1	Set
	(7)	Air chamber filter unit	1	Set
	(8)	Cassette tape	200	Set
	(9)	CD-RW	300	Set

2-2-2-5 Outline of Renovation

Table 2-2-5 gives an outline of renovation in Faqirabad Transmitting Station.

Table 2-2-5 Outline of Renovation

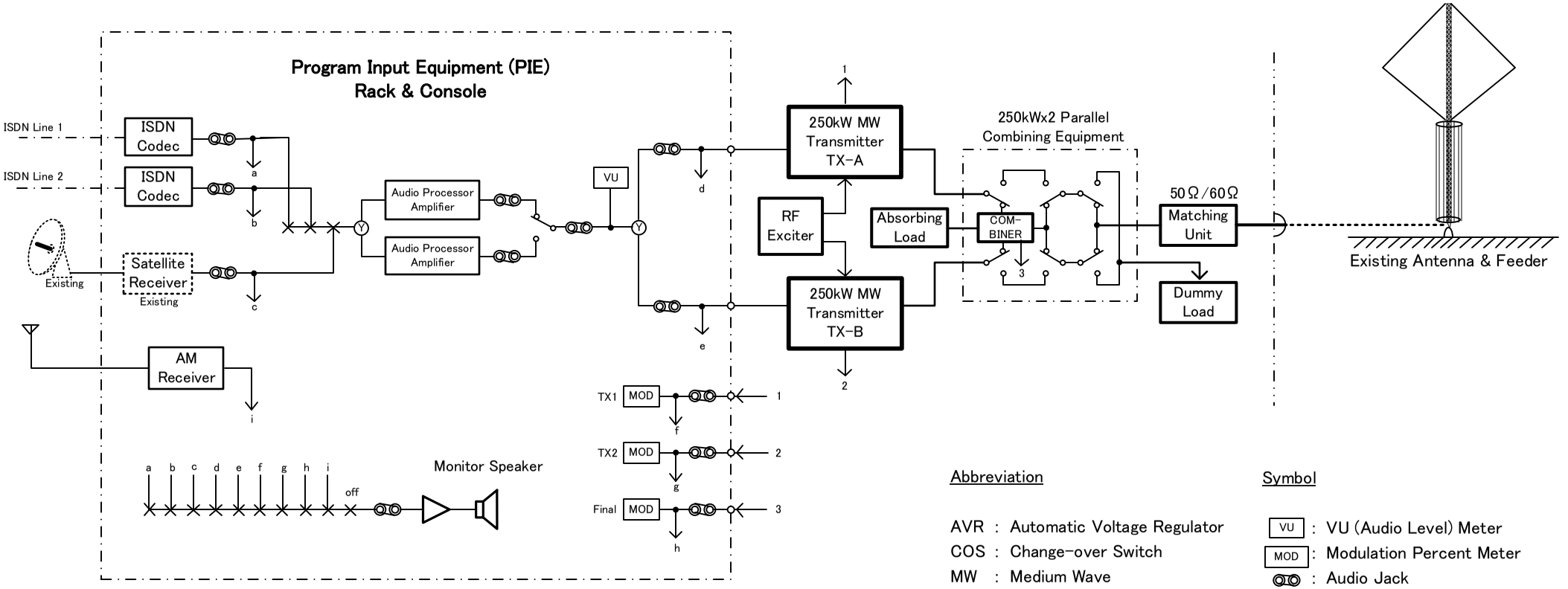
Room	Portion	Current Finish	Improved Finish	Remarks
Control room	Area	137.8m^2	137.8m^2	
	Floor	Terrazzo block tiles	Leave as is.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is. Apply overcoat to 3.5 m.	
	Ceiling	Sound absorbing board CH=4,25m	Leave as is.	
Transmitter room	Area	189.55m^2	189.55m^2	
	Floor	Terrazzo block tiles	Lay antistatic tiles on mortar.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is. Apply overcoat to 3.5 m.	Remove part of the falling wall.
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	
Absorbing dummy room	Area	38.4m^2	38.4m^2	Including piping pit space.
	Floor	Terrazzo block tiles	Lay antistatic tiles on mortar.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is. Apply overcoat to 3.5 m.	
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	
Combiner room	Area	76.8m^2	64.26m^2	
	Floor	Terrazzo block tiles	Lay antistatic tiles on mortar.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is. Apply overcoat to 3.5 m.	
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	
Air chamber room	Area		12.54m^2	
	Floor	----	Mortar	
	Walls	----	Mortar coating	
	Ceiling	----	Mortar coating	
Tube room	Area		12.54m^2	
	Floor	Terrazzo block tiles	Leave as is.	
	Walls	Overcoat of concrete surface	Leave as is.	
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	
33kV distribution room	Area	33.3m^2	33.3m^2	
	Floor	Terrazzo block tiles	Leave as is.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is.	
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	
11kV distribution arrangement	Area	76.8m^2	76.8m^2	
	Floor	Terrazzo block tiles	Leave as is.	Replace pit cover
	Walls	Overcoat of concrete surface	Leave as is.	
	Ceiling	Overcoat of concrete surface CH=5.95	Leave as is.	

Concerning the related of installation of the transmitter, since there is much damage on the cable pit cover on the existing floor, this cover will be replaced in the works and the floor of the transmitter room will be raised using antistatic tiles. Also, the cooling ducts for equipment will be renovated. In the transmitter room, partition walls will be installed in the necessary parts in order to prevent dust infiltration and improve cooling efficiency, and dustproof doors will be installed for outside doors in order to enhance the overall airtightness. Moreover, concerning incorporation of outside air for cooling the transmitter, an air chamber will be installed to prevent the infiltration of sand and dust. The dummy load cooling unit will be installed outside and a folded-plate roof will be attached to protect it.

2-2-3 Outline Design Drawing

The outline design drawings are as follows.

Drawing No.	Title of Drawing
TX-01	Block Diagram of 500kW Medium Wave Transmitter System
ST-01	Block Diagram of Total Studio System
ST-02	Block Diagram of ON AIR Studio System
ST-03	Block Diagram of Production Studio System
ST-04	Block Diagram of Editing Studio System
ST-05-01	Block Diagram of Master Control System (1/2)
ST-05-02	Block Diagram of Master Control System (2/2)
ST-06	Block Diagram of Non-linear Editing Network
Sy-07	Block Diagram of Master Telephone Line
ST-08	Equipment Layout of ON AIR Studio System
ST-09	Panel Layout of Master Console
A-01	FAQIRABAD TRANSMITTING STATION EXISTING FLOOR PLAN
A-02	FAQIRABAD TRANSMITTING STATION EXISTING BUILDING ELEVATION 1
A-03	FAQIRABAD TRANSMITTING STATION EXISTING BUILDING ELEVATION 2
A-04	FAQIRABAD TRANSMITTING STATION EXISTING BUILDING ELEVATION 3
A-05	FAQIRABAD TRANSMITTING STATION RENOVATION FLOOR PLAN
A-06	FAQIRABAD TRANSMITTING STATIONEL EVATION OF RENOVATION BUILDING 1
A-07	FAQIRABAD TRANSMITTING STATION ELEVATION OF RENOVATION BUILDING 2
A-08	FAQIRABAD TRANSMITTING STATION ELEVATION OF RENOVATION WALL 1
A-09	FAQIRABAD TRANSMITTING STATION ELEVATION OF RENOVATION WALL 2
A-10	FAQIRABAD TRANSMITTING STATION EXISTING OUTDOOR EQUIPMENT PLAN
A-11	FAQIRABAD TRANSMITTING STATION CANOPY FOR DUMMY ROAD EQUIPMEN
A-12	PBC BUILDING FLOOR PLAN

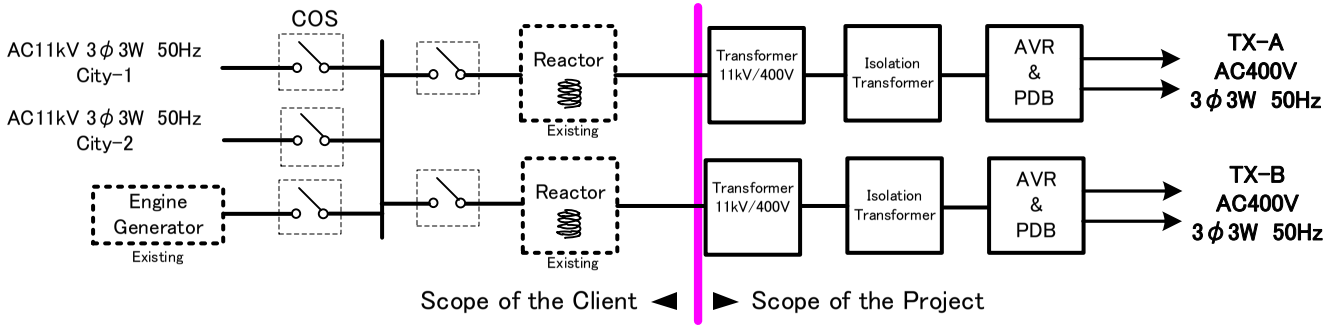


Abbreviation

AVR : Automatic Voltage Regulator
COS : Change-over Switch
MW : Medium Wave
NFB : Non Fuse Breaker
PDB : Primary Distribution Board

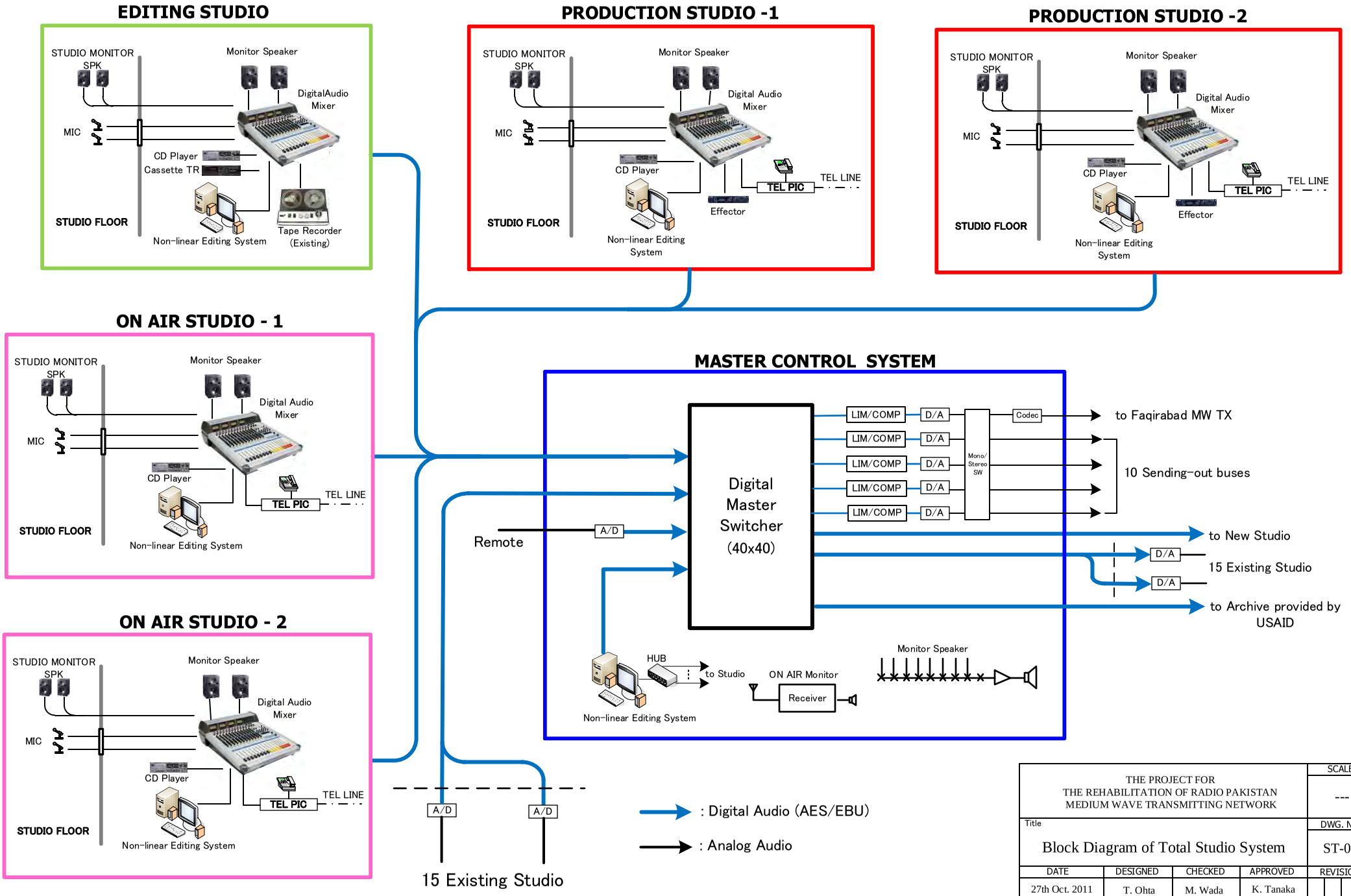
Symbol

VU : VU (Audio Level) Meter
MOD : Modulation Percent Meter
: Audio Jack



THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE: ---
Title: Block Diagram of 500kW Medium Wave Transmitter System				DWG. No.: TX-01
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	M. Wada	M. Wada	K. Tanaka	

YACHIYO ENGINEERING CO., LTD. TOKYO JAPAN



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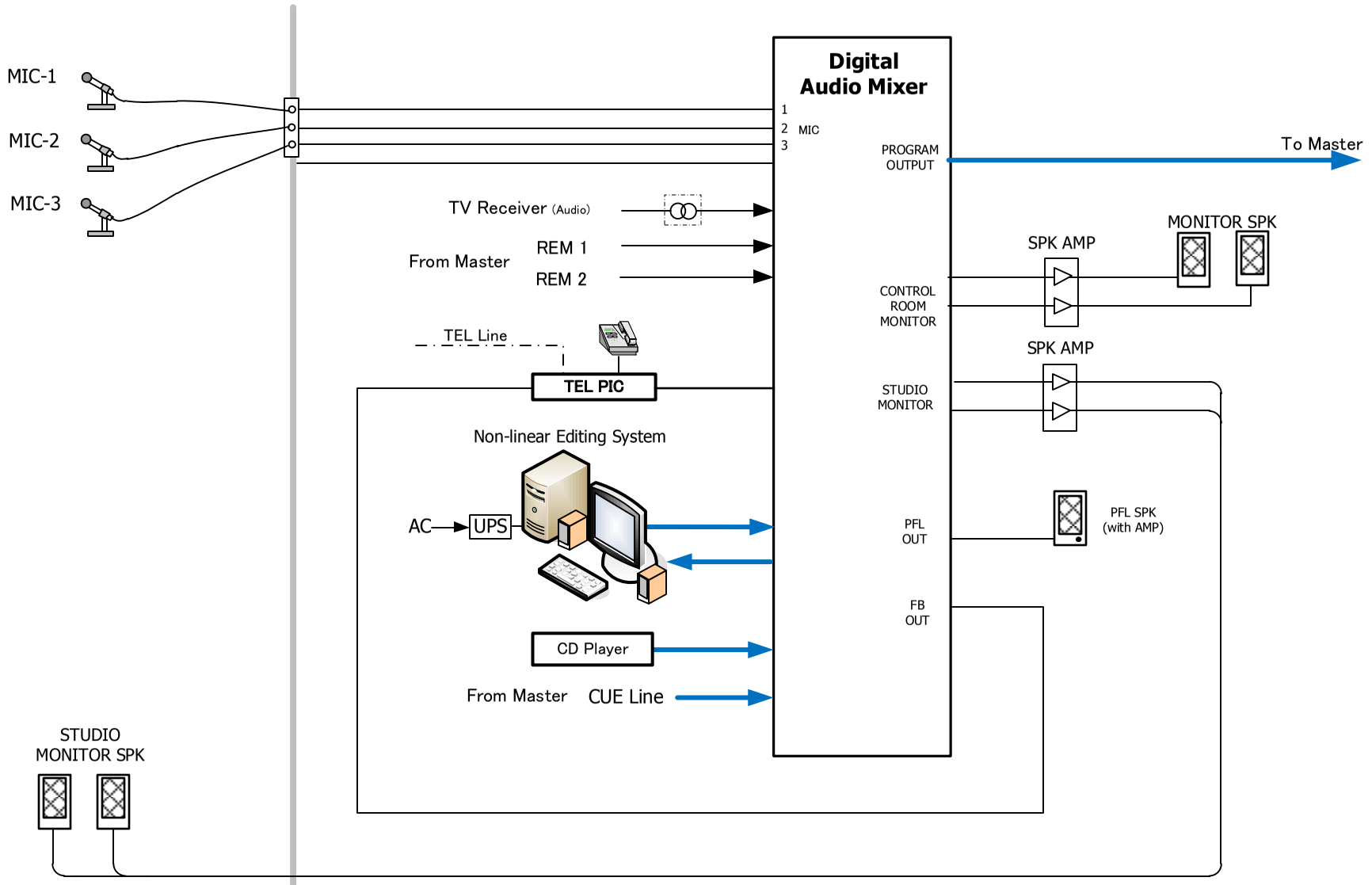
Title: Block Diagram of Total Studio System				DWG. No.: ST-01
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

YACHIYO ENGINEERING CO., LTD. TOKYO JAPAN



INTERPHONE — INTERPHONE

Studio Floor | Control Room

Abbreviation

M I C : Microphone
S P K : Speaker

: AES/EBU Digital Audio

THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE: ---
Title: Block Diagram of ON AIR Studio System				DWG. No.: ST-02
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

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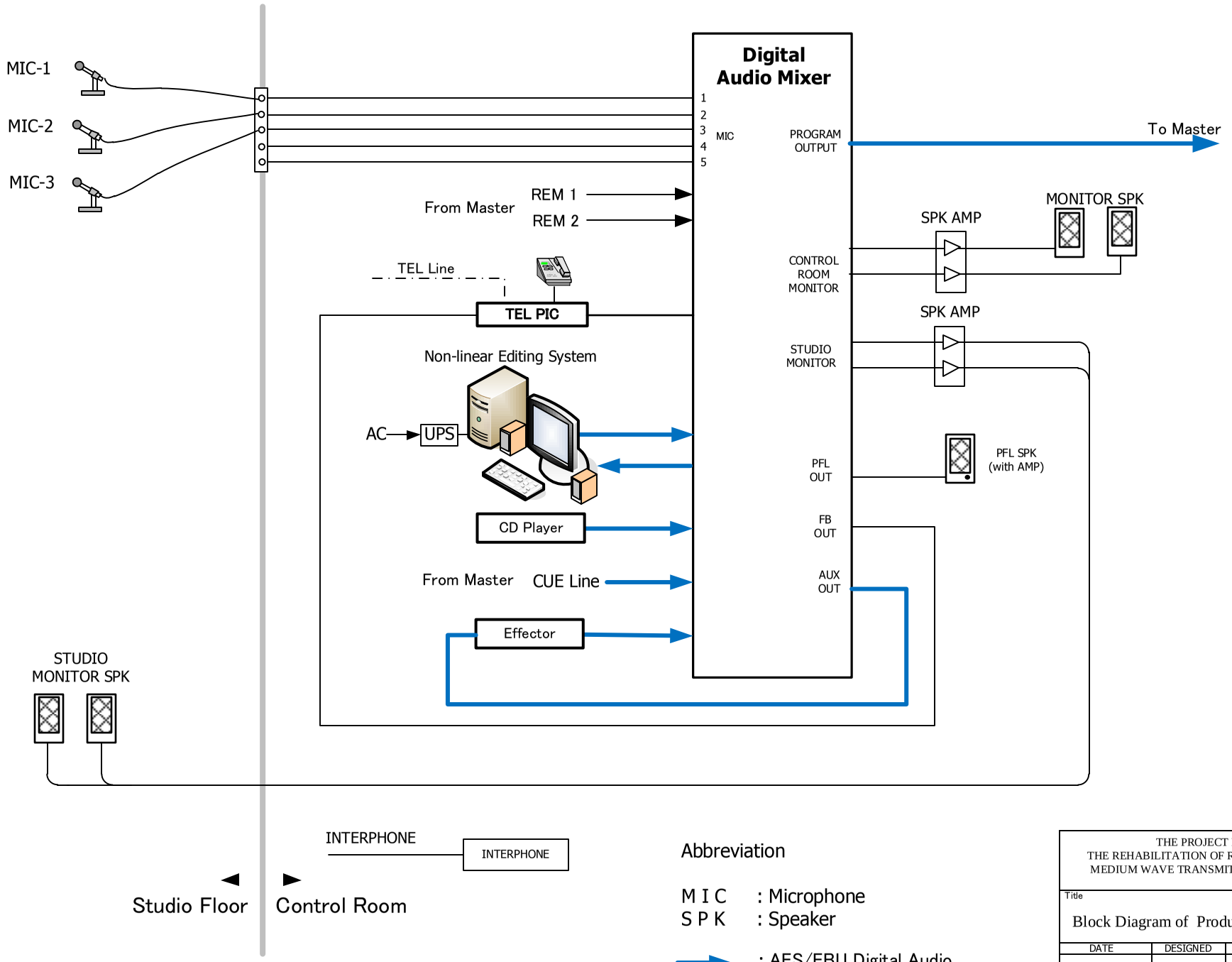
TOKYO JAPAN



Abbreviation

M I C : Microphone
S P K : Speaker

: AES/EBU Digital Audio

THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE: ---
Title: Block Diagram of Production Studio System				DWG. No.: ST-03
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

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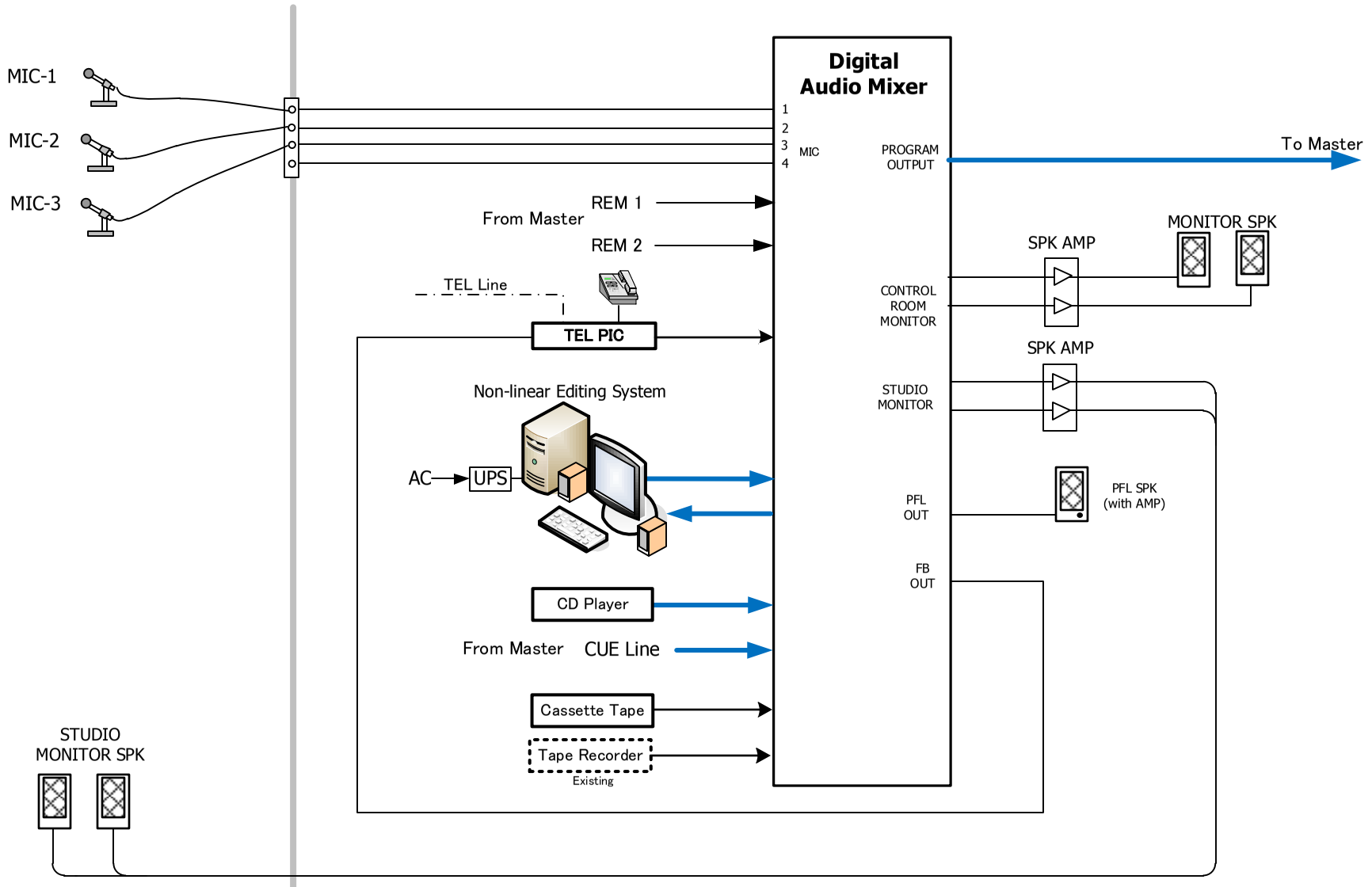
TOKYO JAPAN



INTERPHONE — INTERPHONE

◄ Studio Floor ► Control Room

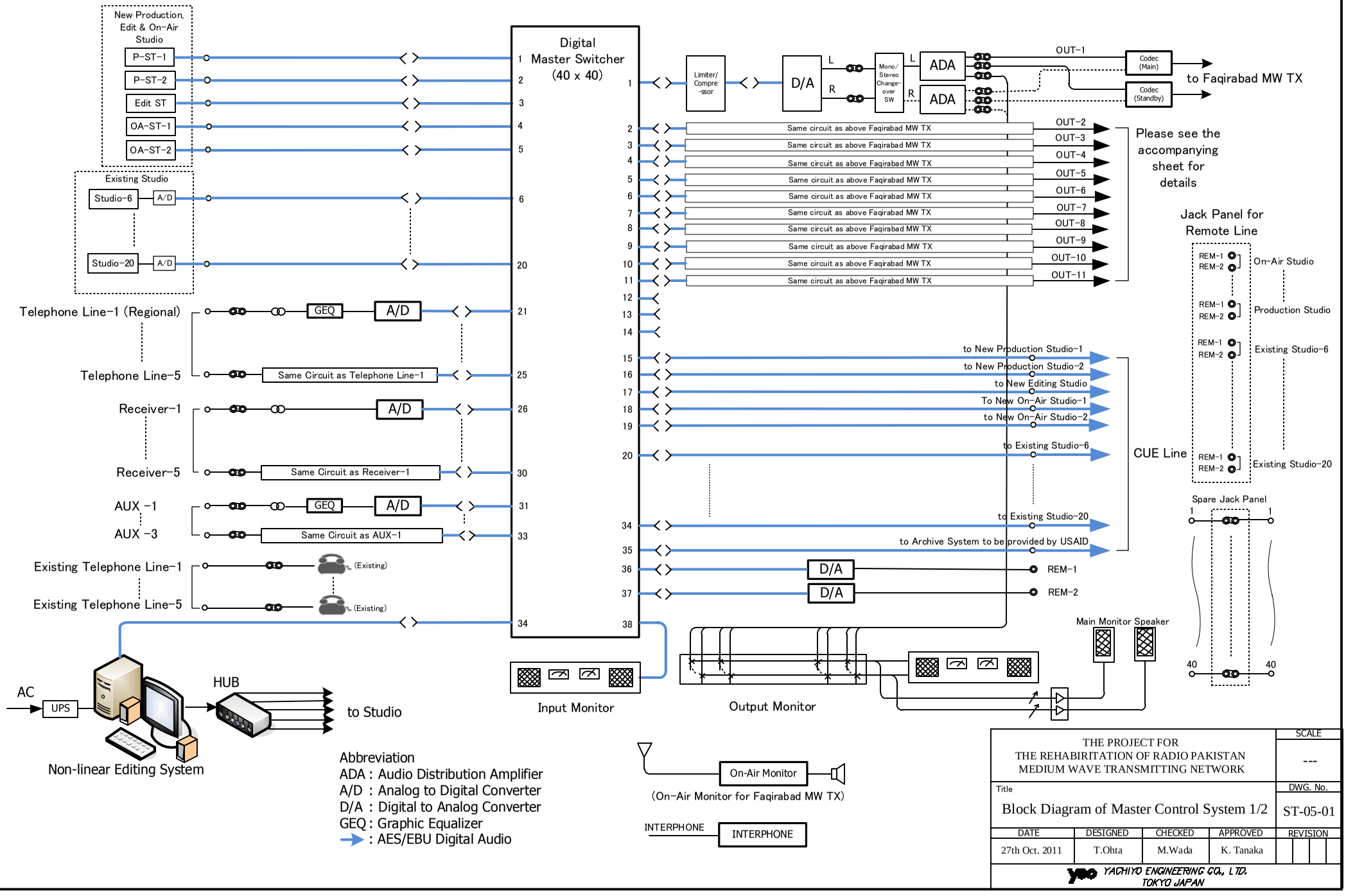
Abbreviation

M I C : Microphone
S P K : Speaker

: AES/EBU Digital Audio

THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE: ---
Title: Block Diagram of Editing Studio System				DWG. No.: ST-04
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

YACHIYO ENGINEERING CO., LTD.
TOKYO JAPAN



THE PROJECT FOR
THE REHABIRITATION OF RADIO PAKISTAN
MEDIUM WAVE TRANSMITTING NETWORK

SCALE: ---

Title: Block Diagram of Master Control System 1/2

DWG. No.: ST-05-01

DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T.Ohta	M.Wada	K. Tanaka	

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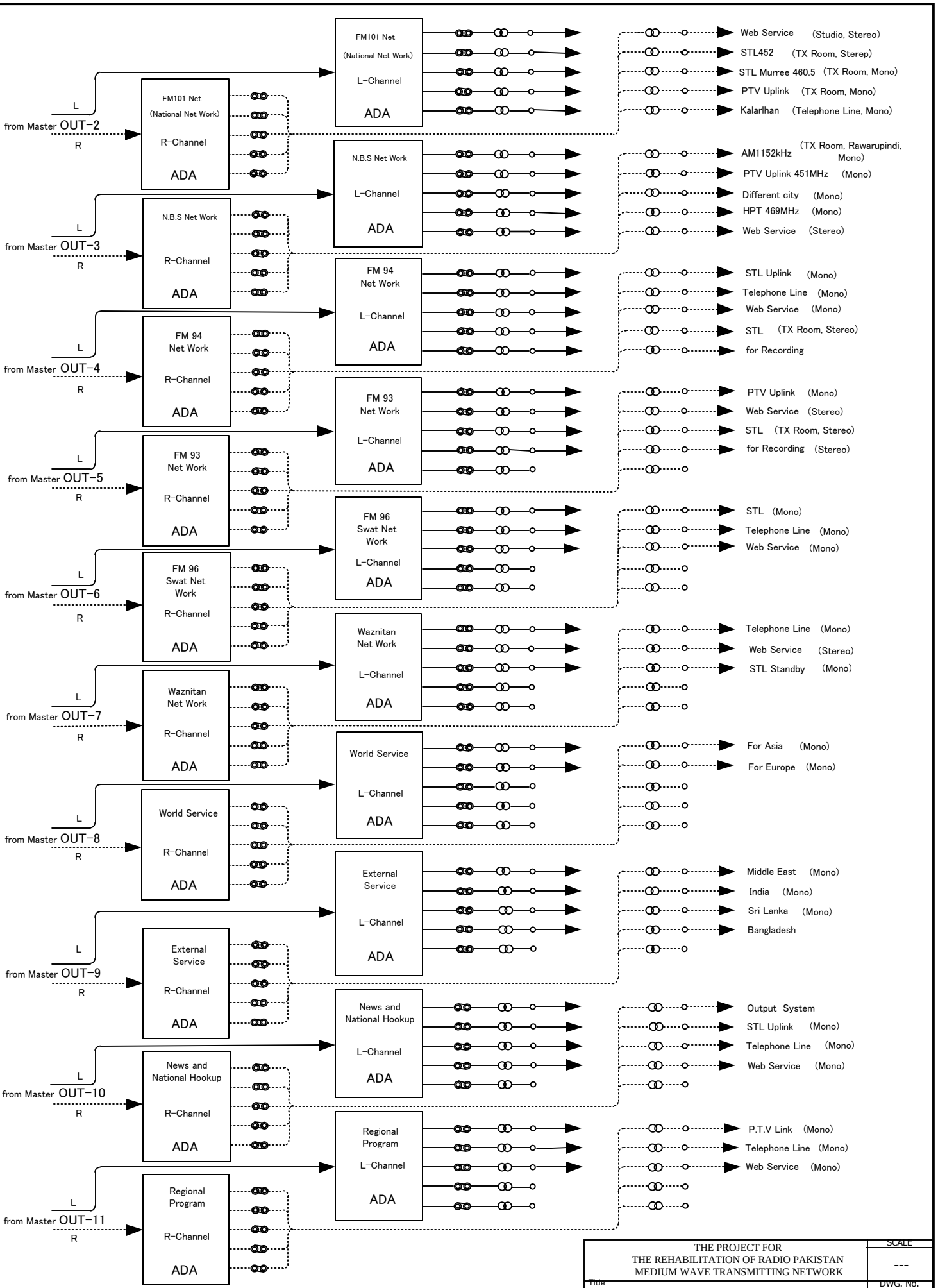
TOKYO JAPAN



THE PROJECT FOR
THE REHABILITATION OF RADIO PAKISTAN
MEDIUM WAVE TRANSMITTING NETWORK

SCALE: ---

Title: Block Diagram of Master Control System 2/2

DWG. No.: ST-05-02

DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

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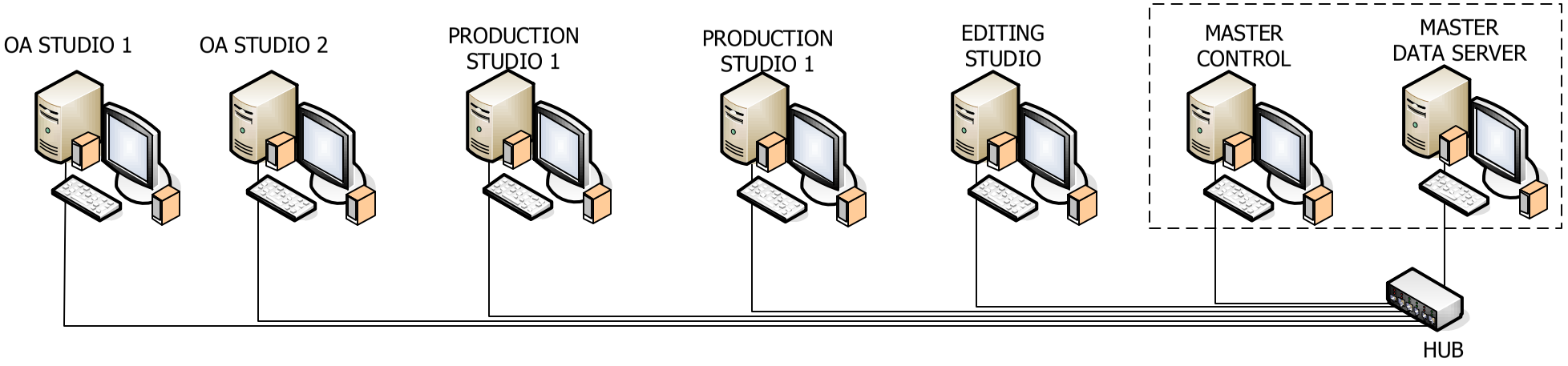
TOKYO JAPAN



THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE ---
Block Diagram of Non-linear Editing Network				DWG. No. ST-06
DATE	DESIGNED	CHECKED	APPROVED	REVISION
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MASTER CONTROL

Terminal Box — OA STUDIO 1

Terminal Box — OA STUDIO 2

Terminal Box — PRODUCTION STUDIO 1

Terminal Box — PRODUCTION STUDIO 2

Terminal Box — EDITING STUDIO

Terminal Box

Terminal Box

EXISTING STUDIO

Terminal Box

THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE: ---
Title: Block Diagram of Master Telephone Line				DWG. No.: ST-07
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	

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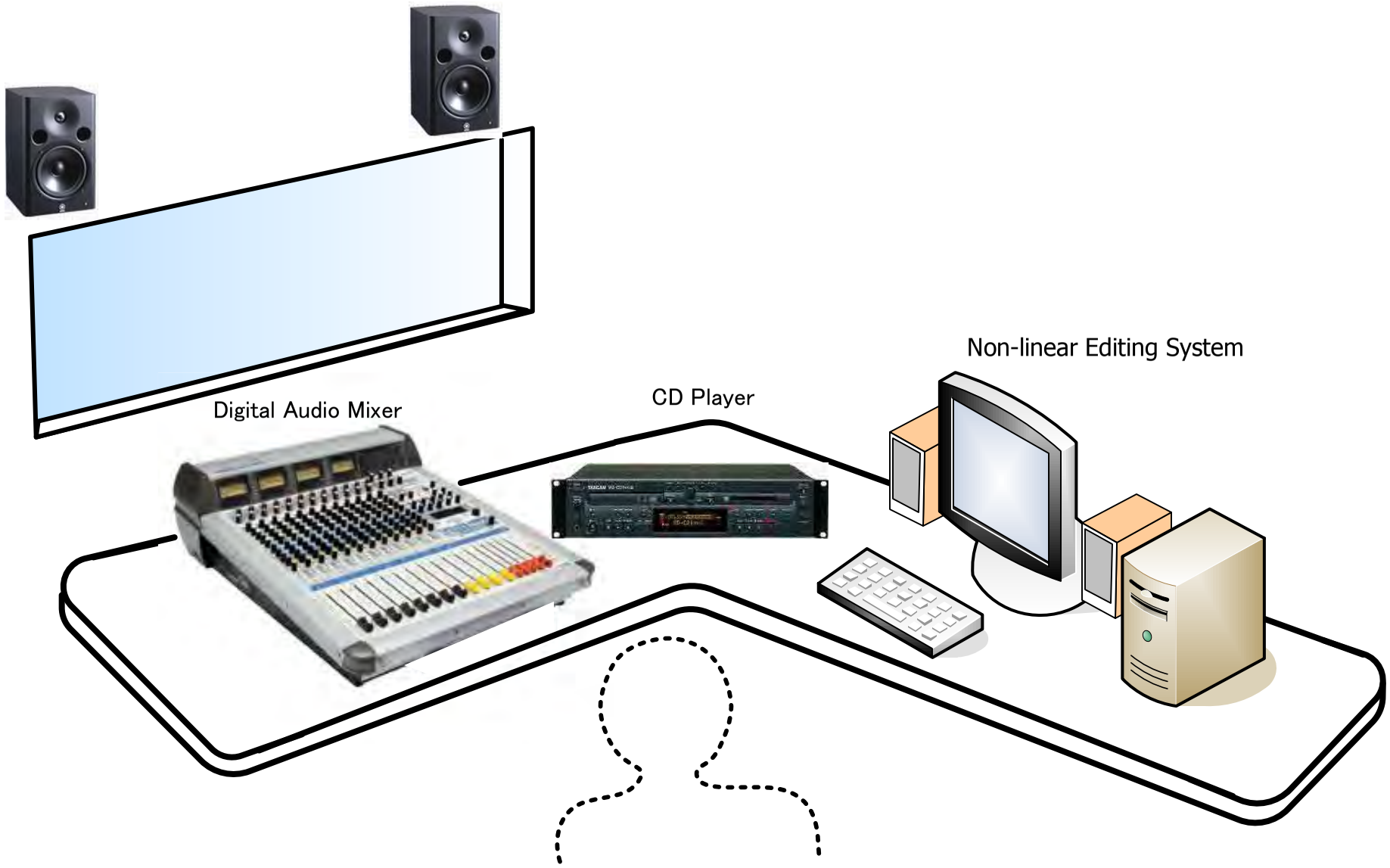

THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE ---
Title Equipment Layout of ON Studio Control Room				DWG. No. ST-08
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	
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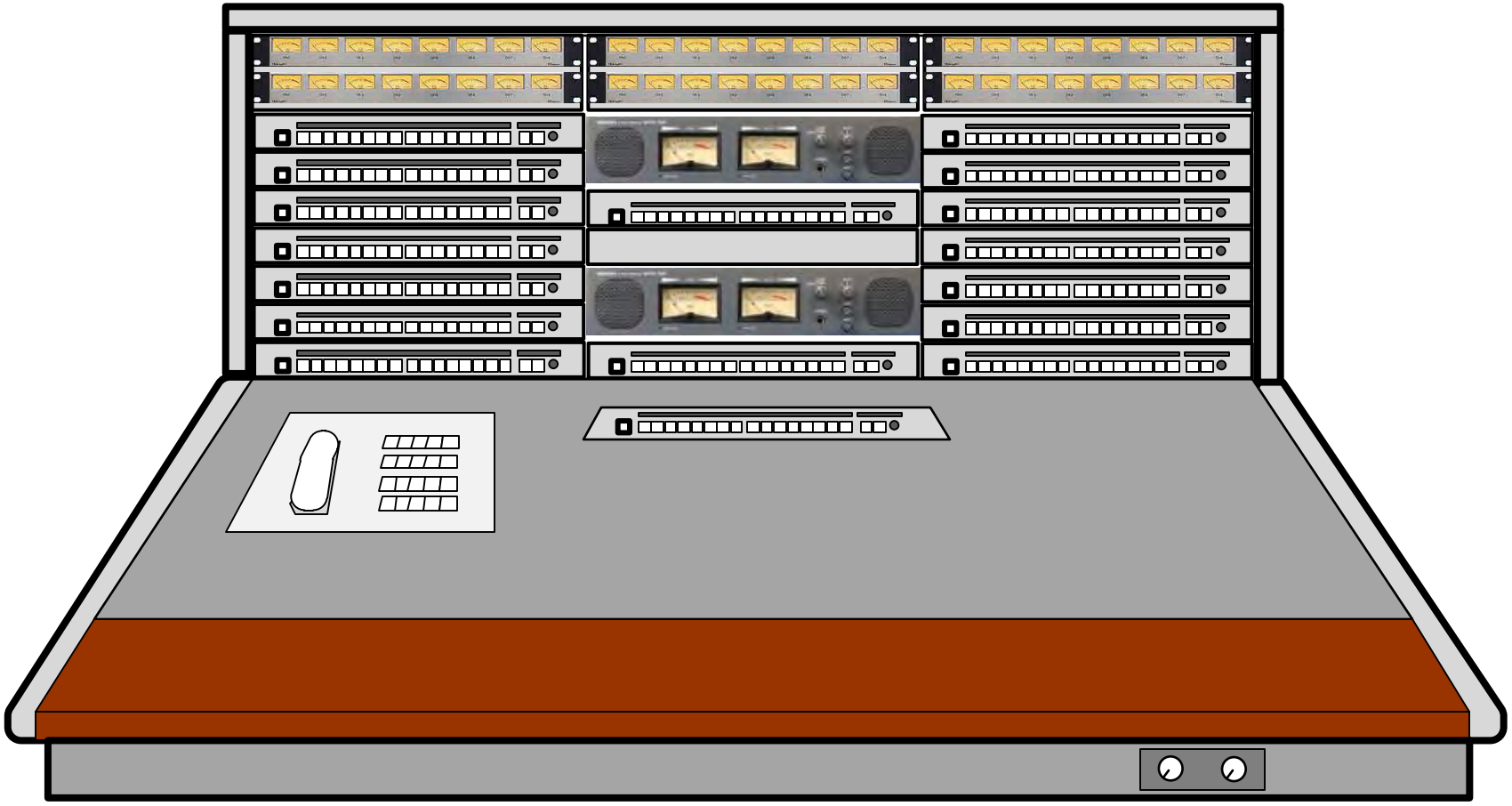
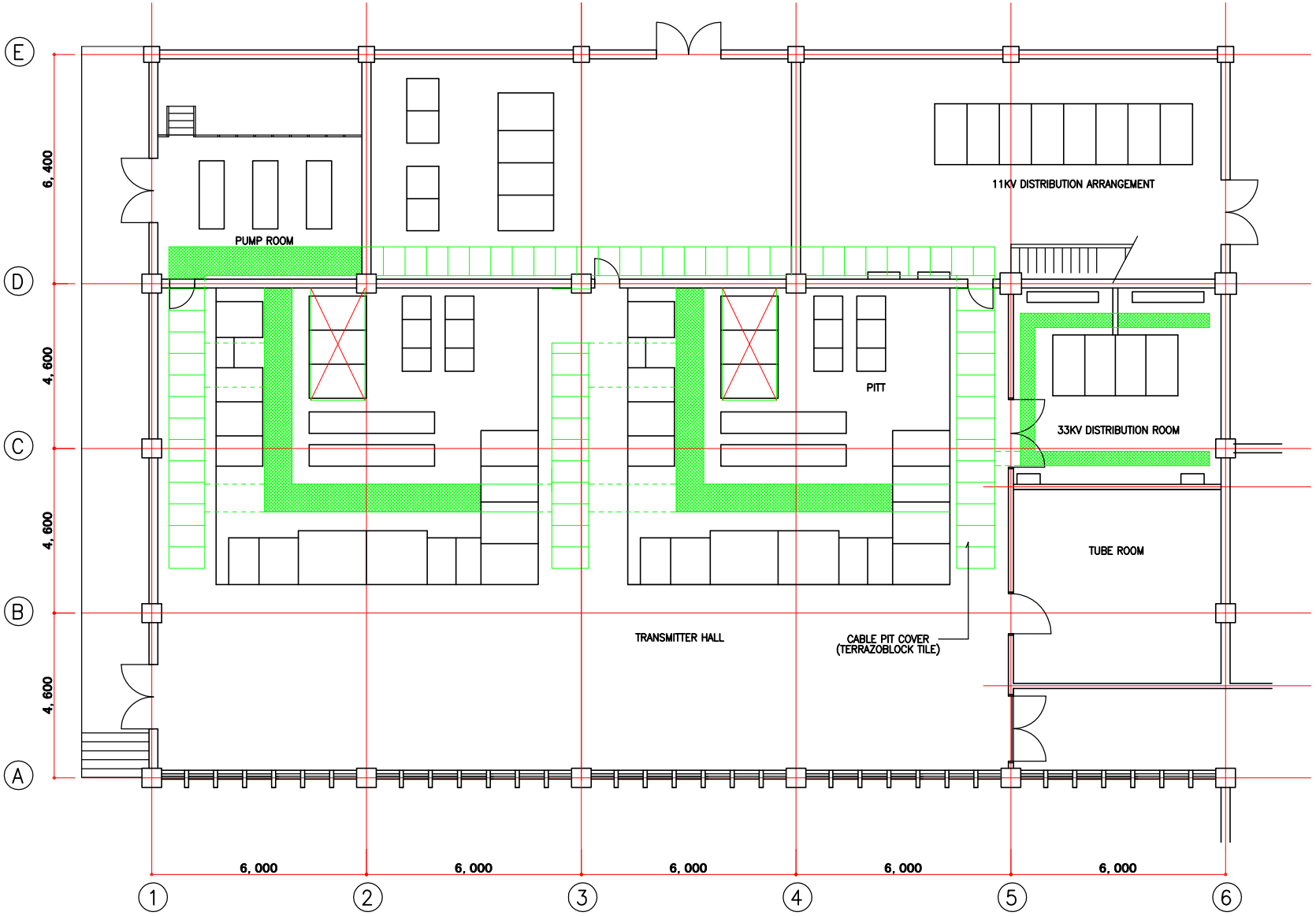
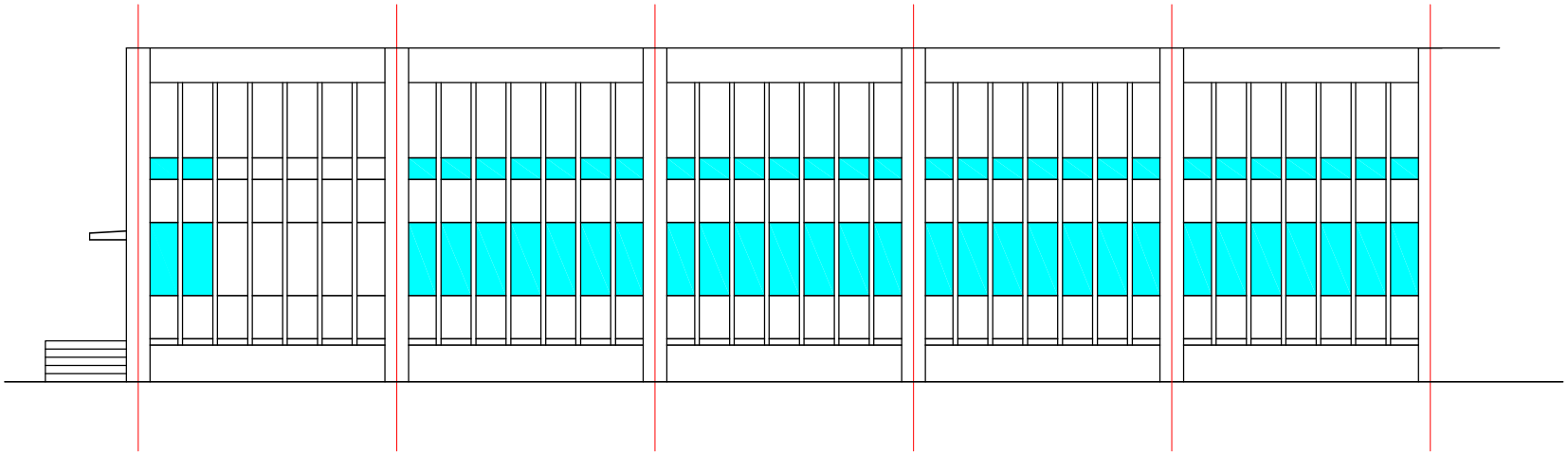


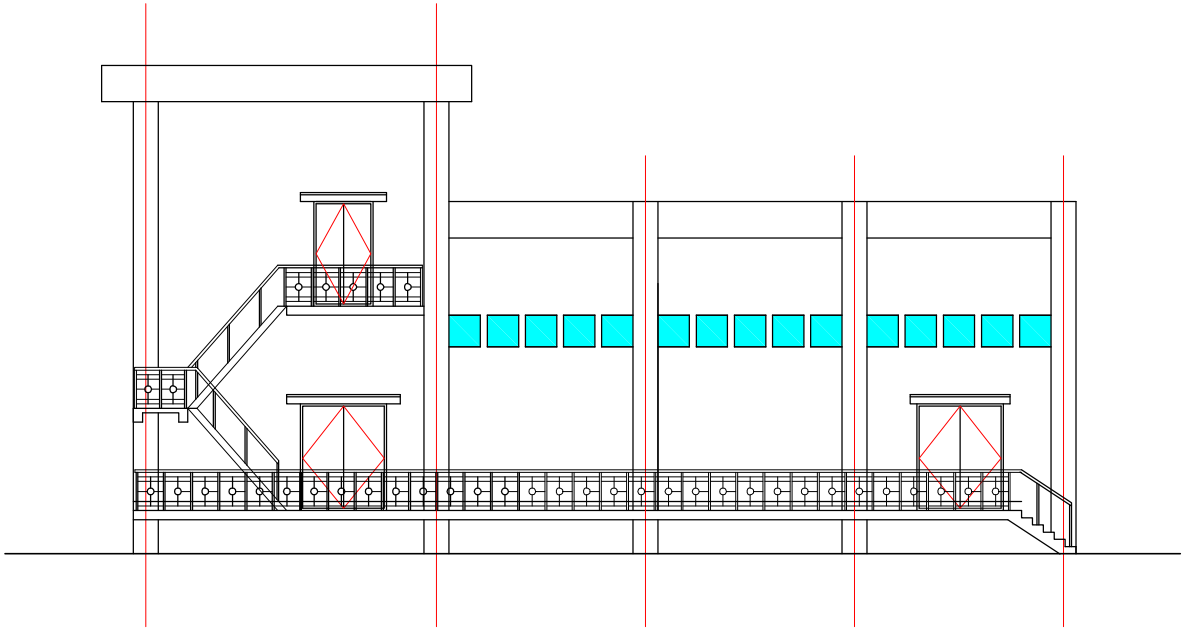
THE PROJECT FOR THE REHABILITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE ---
Title Panel Layout of Master Console				DWG. No. ST-09
DATE	DESIGNED	CHECKED	APPROVED	REVISION
27th Oct. 2011	T. Ohta	M. Wada	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				



THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION EXISTING FLOOR PLAN				DWG No. A-01
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				

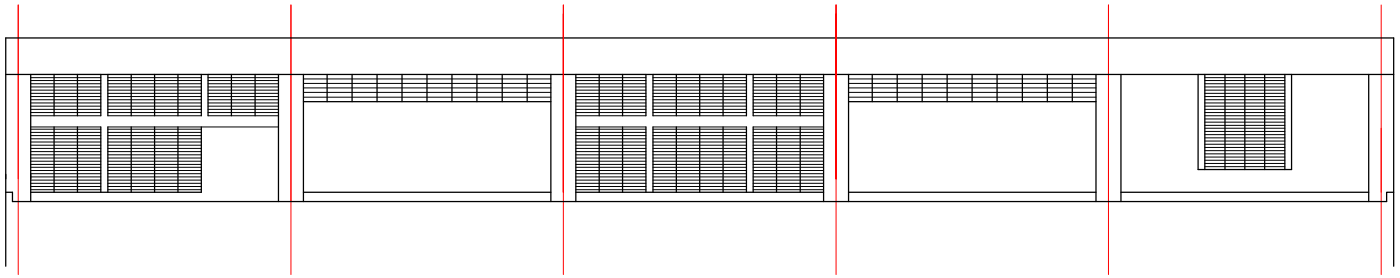


LINE (A) ELEVATION

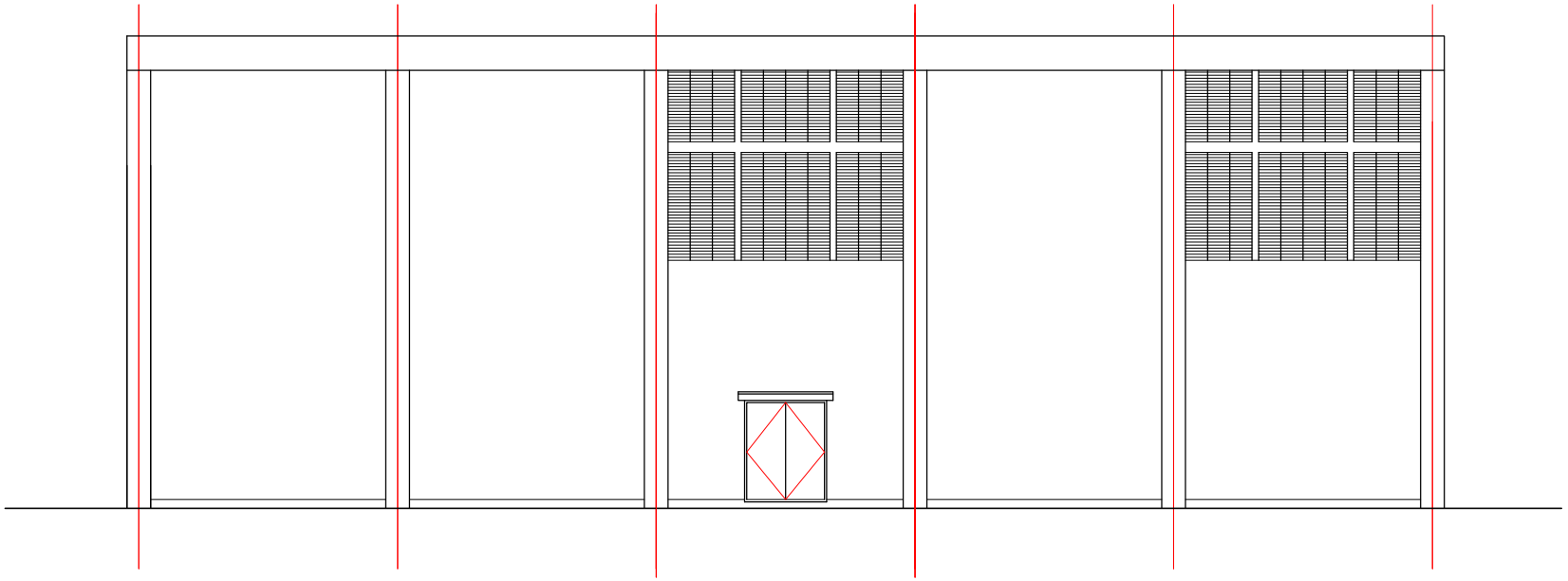


LINE (1) ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION EXISTING BUILDING ELEVATION 1				DWG No. A-02
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
yec	YACHIYO ENGINEERING CO., LTD TOKYO JAPAN			

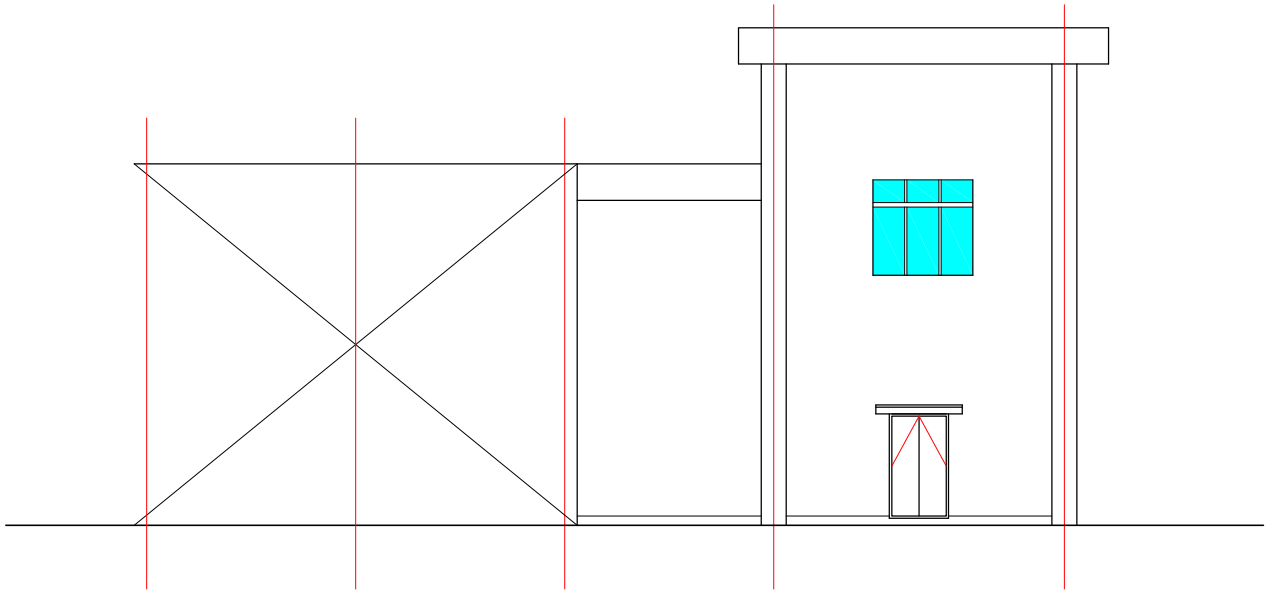


LINE (D) ELEVATION



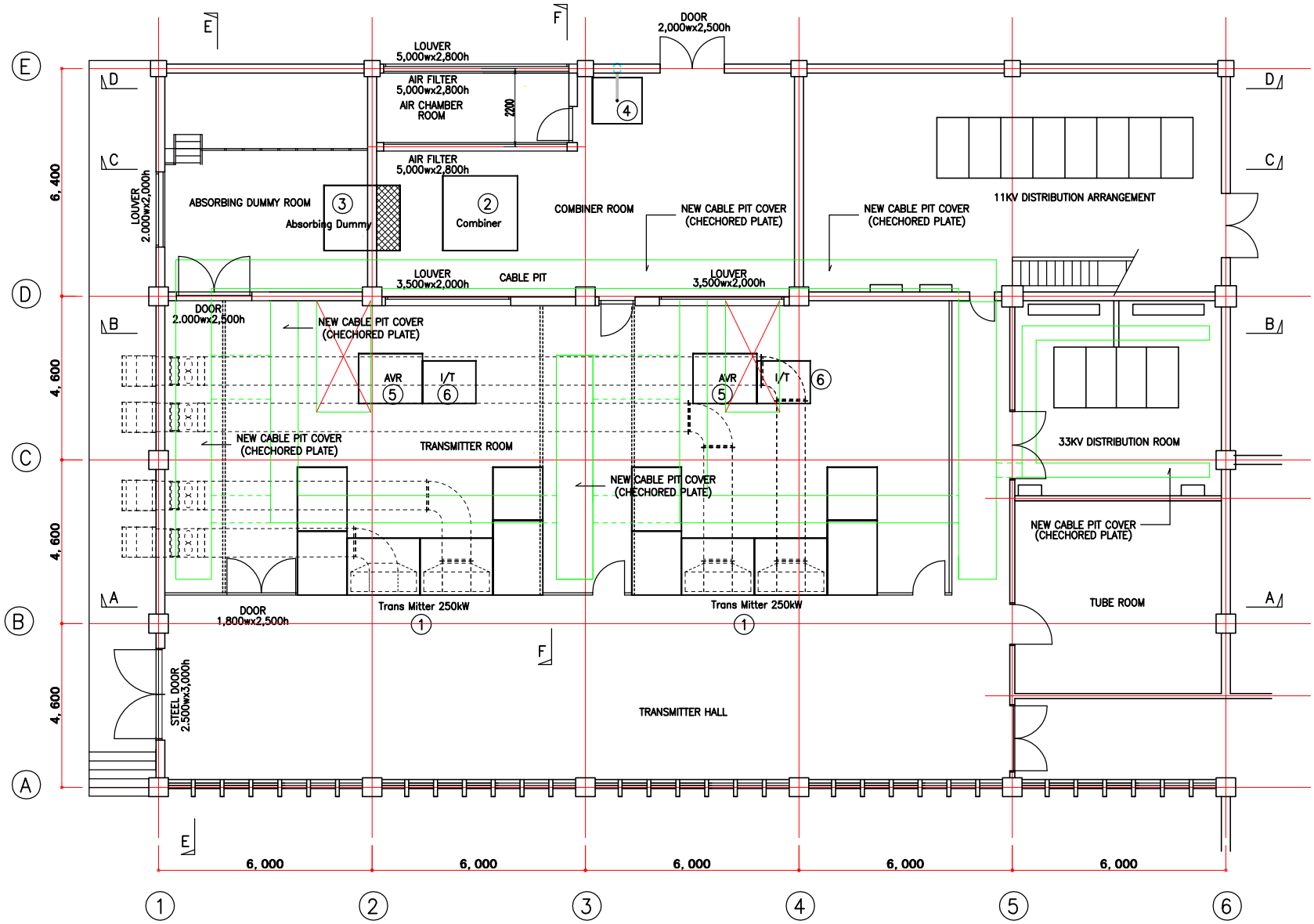
LINE (E) ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION EXISTING BUILDING ELEVATION 2				DWG No. A-03
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
yec	YACHIYO ENGINEERING CO., LTD TOKYO JAPAN			

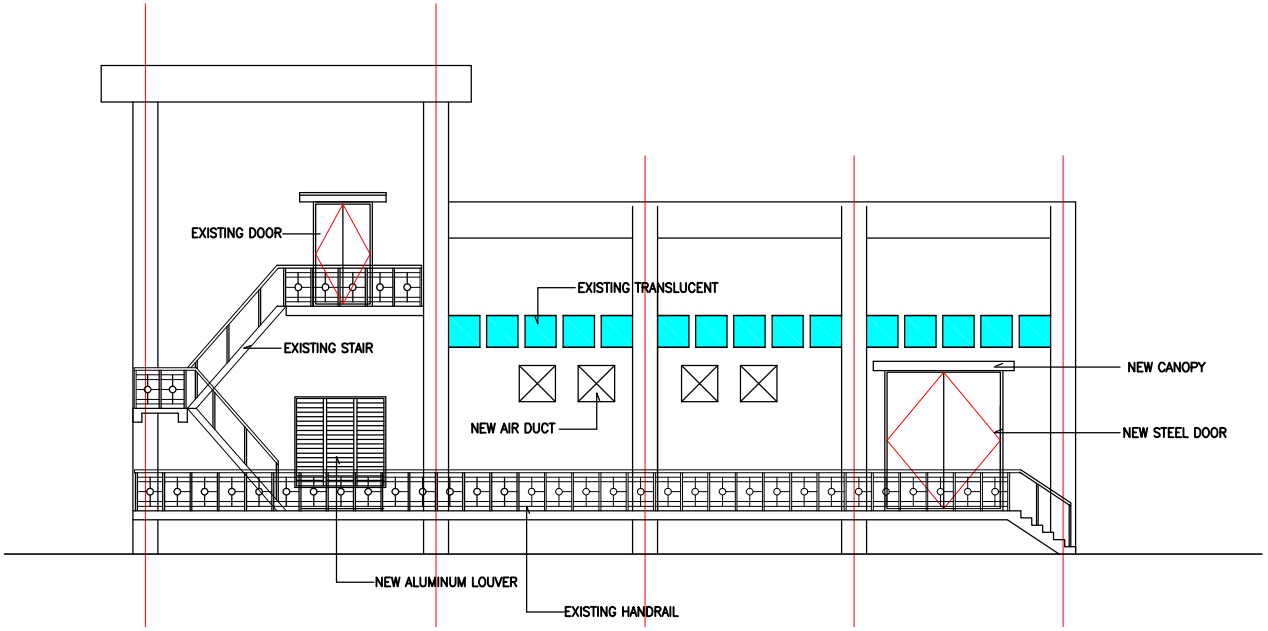


LINE ⑥ ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION EXISTING BUILDING ELEVATION 3				DWG No. A-04
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
yec	YACHIYO ENGINEERING CO., LTD TOKYO JAPAN			

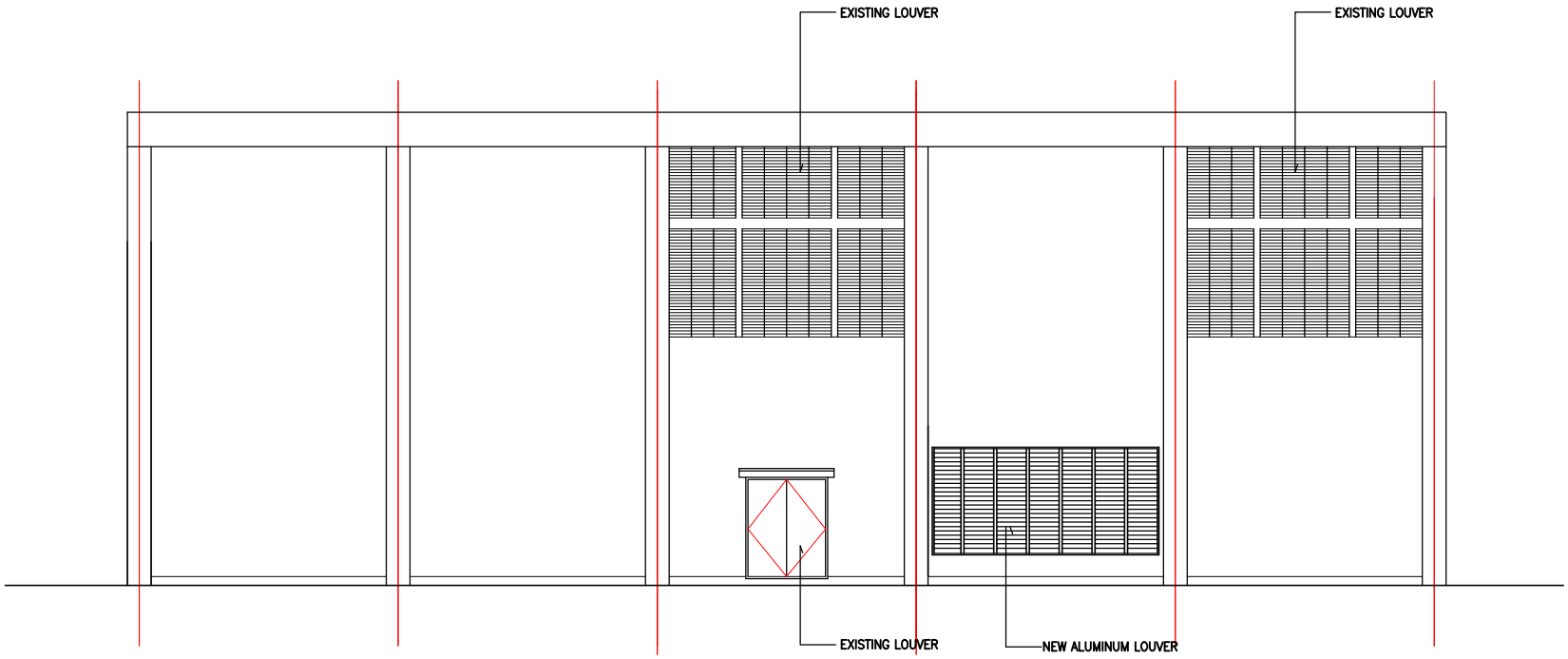


THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION RENOVATION FLOOR PLAN				DWG No. A–05
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				



LINE ① ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION ELEVATION OF RENOVATION BUILDING 1				DWG No. A-06
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				



LINE (E) ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION ELEVATION OF RENOVATION BUILDING 2				DWG No. A-07
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
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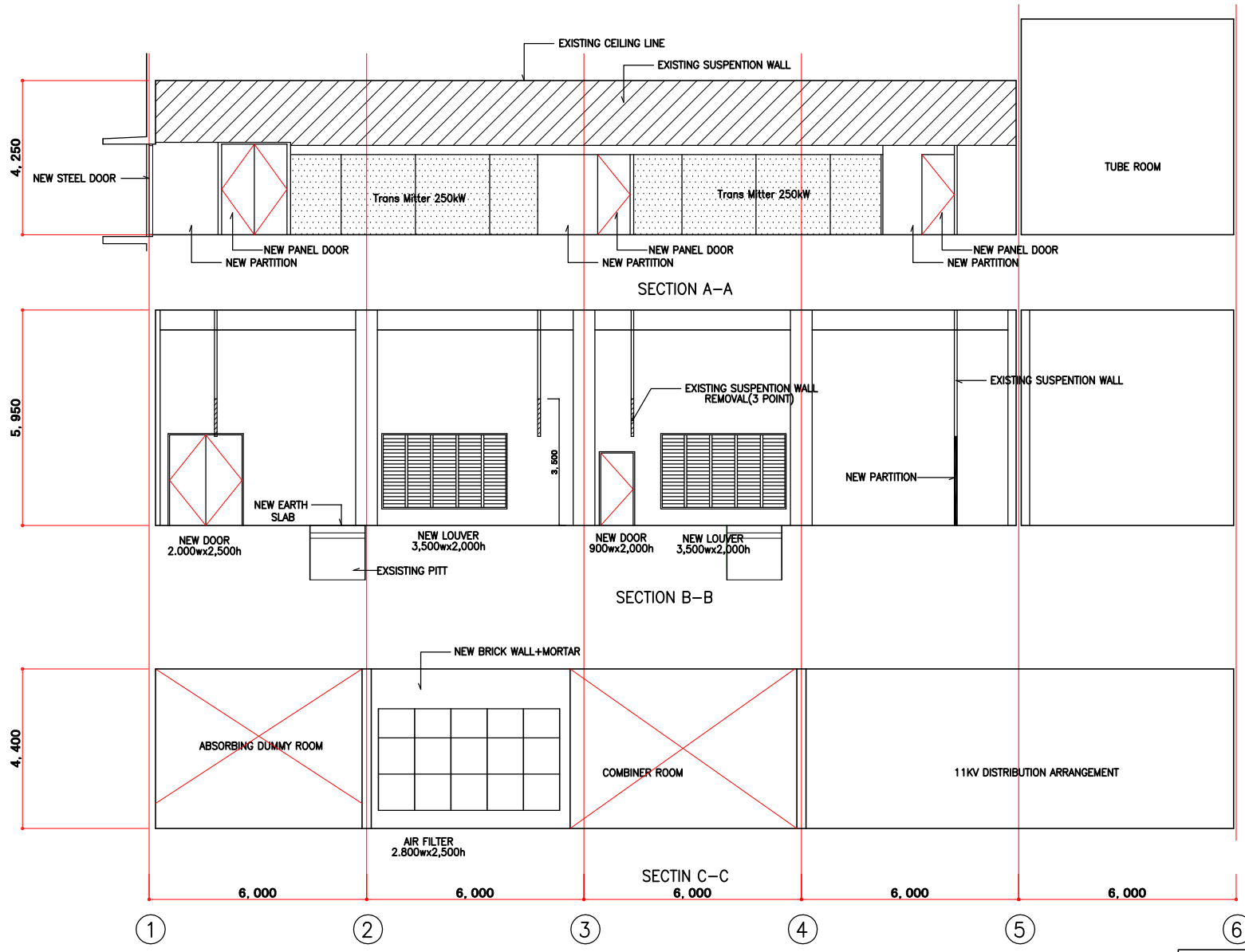
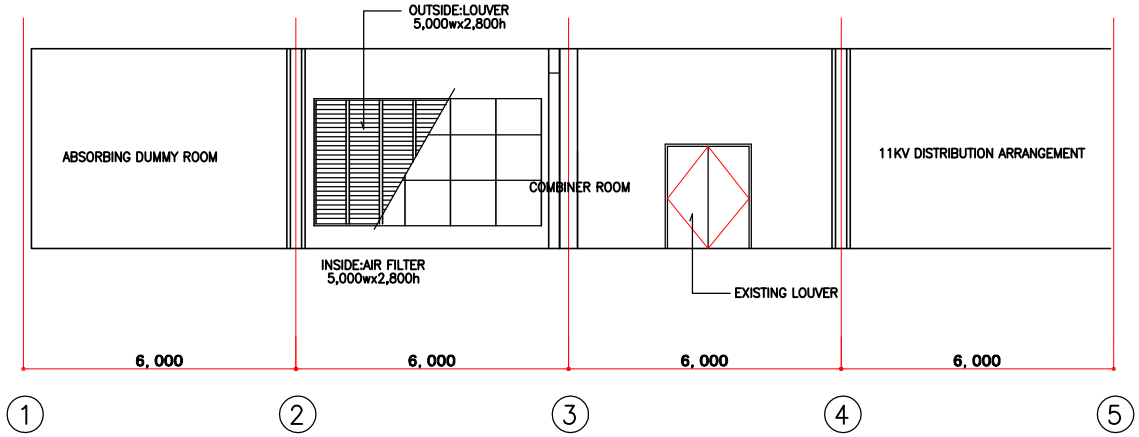
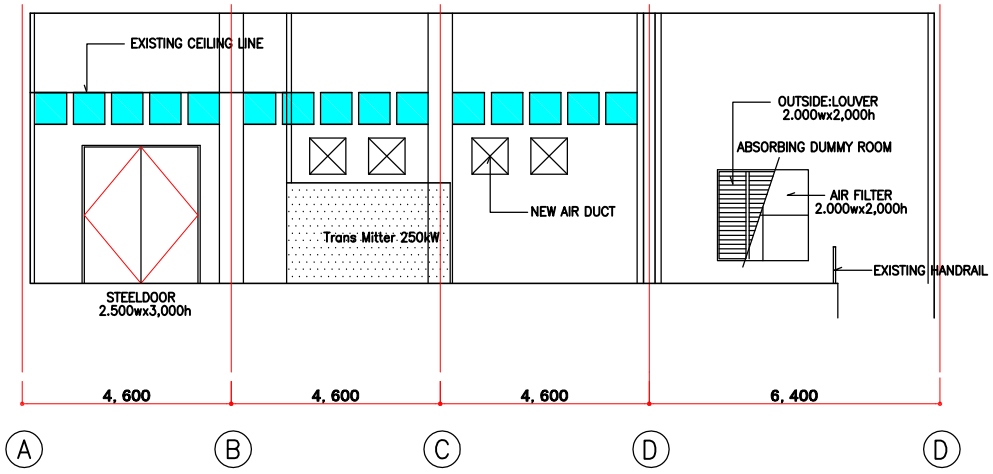
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				



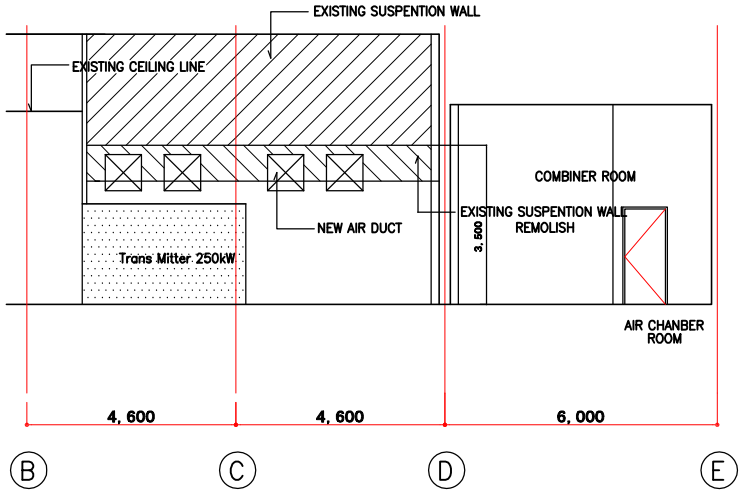
THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION ELEVATION OF RENOVATION WALL 1				DWG No. A–08
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				



SECTION D–D

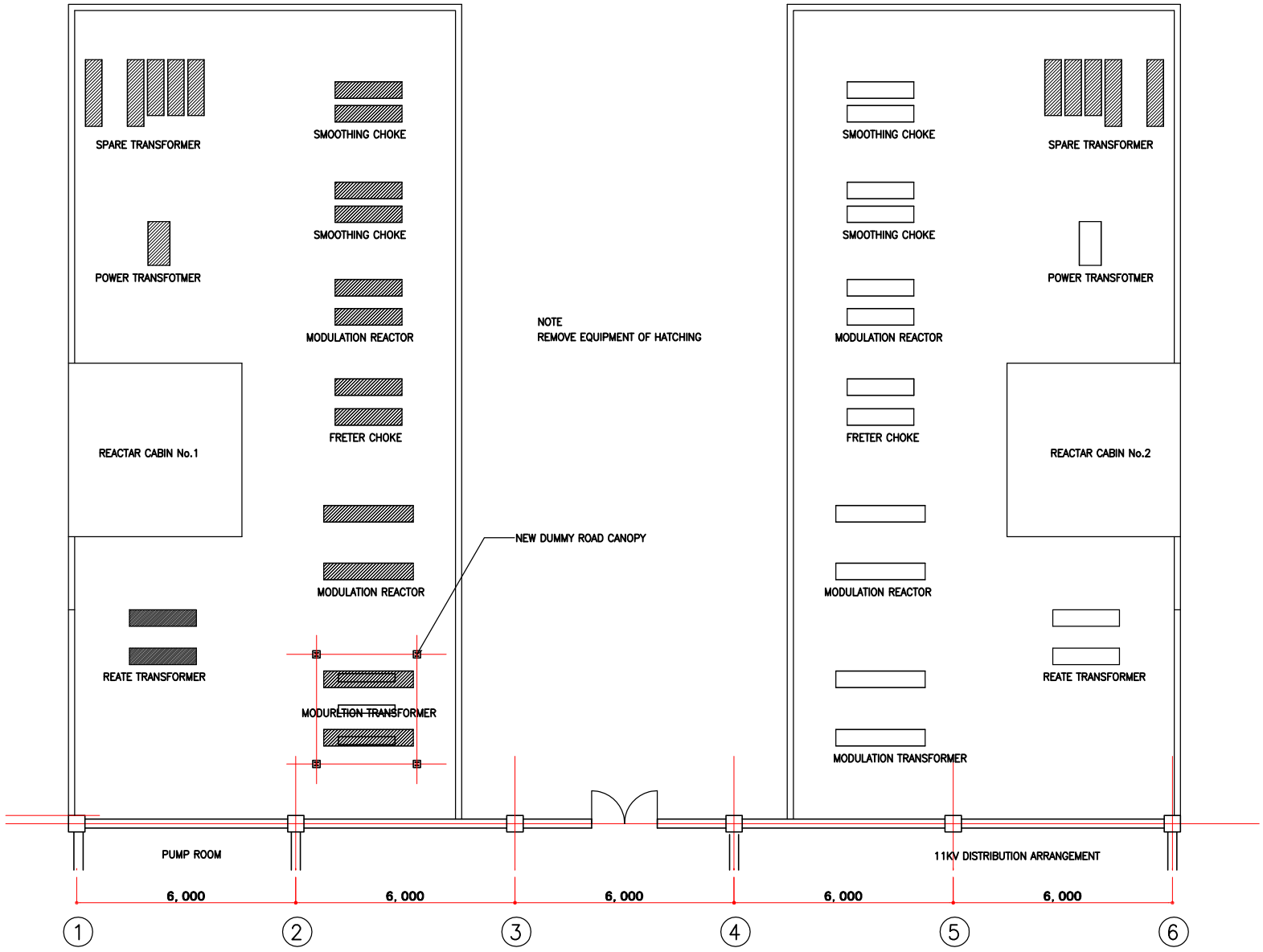


SECTION E–E

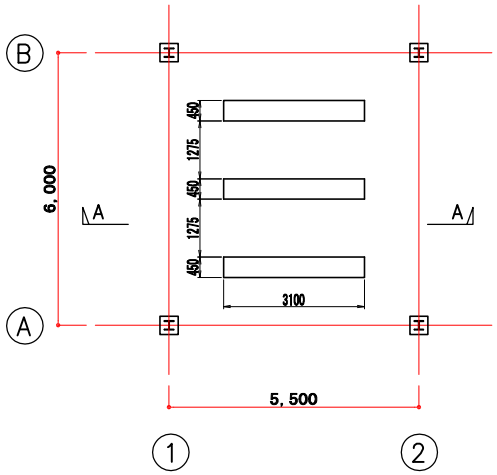


SECTION F–F

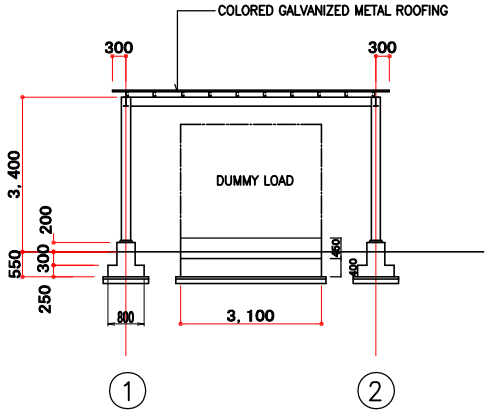
THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION ELEVATION OF RENOVATION WALL 2				DWG No. A–09
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
yec	YACHIYO ENGINEERING CO., LTD TOKYO JAPAN			



THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION EXISTING OUTDOOR EQUIPMENT PLAN				DWG No. A-10
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				

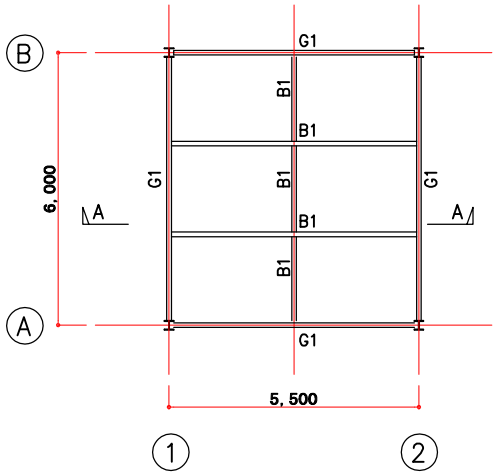


FLOOR PLAN

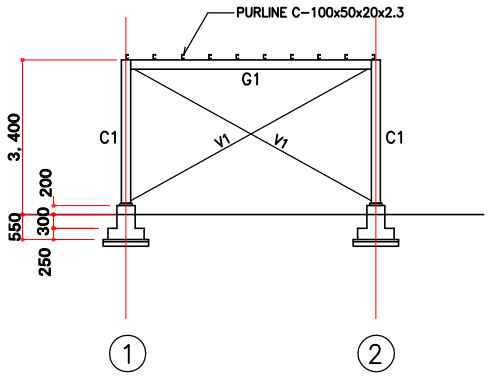


A–A SECTION

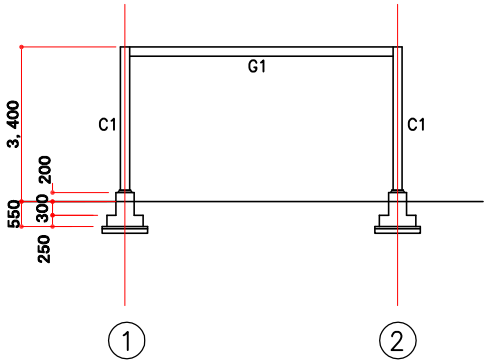
MARK	MATERIAL
C1	H–200x200x8x12
G1	H–200x100x5.5x8
B1	H–200x100x5.5x8
V1	ROUND BAR Φ16



ROOF BEAM PLAN

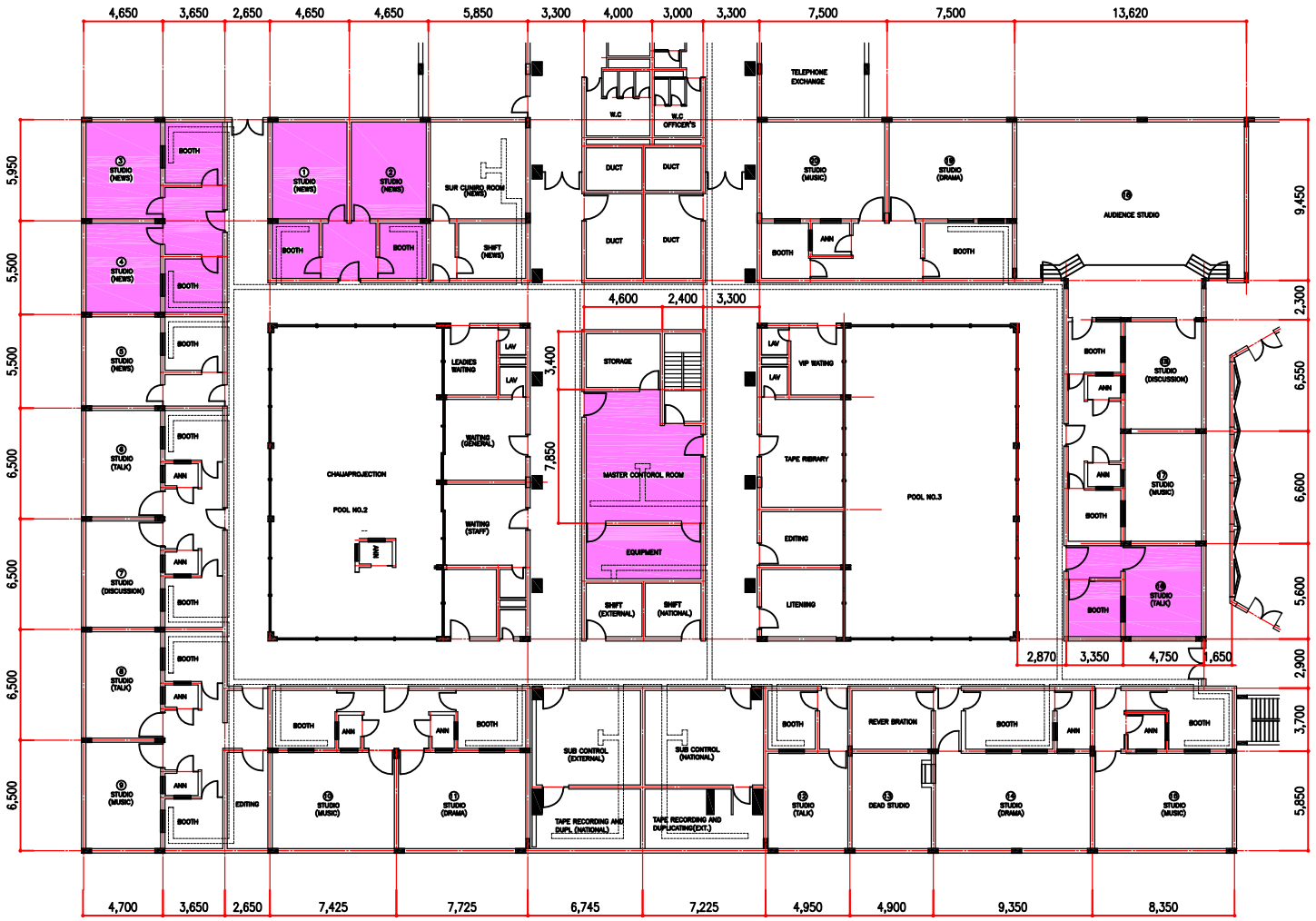


Ⓐ Ⓑ FRAMING ELEVATION



① ② FRAMING ELEVATION

THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
FAQIRABAD TRANSMITTING STASTION CANOPY FOR DUMMY ROAD EQUIPMENT				DWG No. A–11
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
yec	YACHIYO ENGINEERING CO., LTD TOKYO JAPAN			



THE PROJECT FOR THE REHABIRITATION OF RADIO PAKISTAN MEDIUM WAVE TRANSMITTING NETWORK				SCALE
PBC BUILDING EXISTING FLOOR PLAN				DWG No. A-12
DATE	DESIGNED	CHECKED	ARRROVED	REVISION
27th Oct. 2011	S. Sato	T. Nakamura	K. Tanaka	
YACHIYO ENGINEERING CO., LTD TOKYO JAPAN				

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The Project will be implemented under the scheme of Grand Aid. After approval by the Cabinet, the government of Pakistan and the Japanese Government sign Exchange of Notes summarizing the objectives and content of cooperation for the project.. At the project implementation stage following the signing of the EN. The following paragraphs describe the basic items and points requiring particular consideration in the event where the Project is implemented.

(1) Project Implementing Agency

The agency responsible for Project implementation on the Pakistan side is the Ministry of Information and Broadcasting and the implementing agency is PBC. The implementing department in PBC will be the Engineering Department, and PBC Headquarters, which has jurisdiction over the Project site of Faqirabad Transmitting Station, is scheduled to conduct operation and maintenance following the installation of equipment. Therefore, in order to smoothly advance the Project, it will be necessary for PBC Engineering Department to conduct close liaison and discussions with the Japanese consultant and contractor and appoint personnel in charge of the Project.

The Project manager appointed by PBC will need to conduct adequate explanations and secure understanding for the Project contents of PBC employees involved with the transmitting station to be renovated and repaired, as well as government agencies, education agencies and local residents, and thereby ensure that cooperation for the Project is forthcoming.

(2) Consultant

In order to implement the procurement and installation of equipment in the Project, the Japanese consultant will conclude a design supervision contract with PBC and implement the implementation design and execution supervision. Also, the consultant will prepare tender documents and conduct the tender on behalf of PBC (the Project implementing agency).

(3) Contractor

In accordance with the framework of Japan's Grant Aid scheme, the Japanese contractor that has been selected by the Pakistanis side in competitive tender will implement the equipment procurement and installation works of the Project. Following completion of the Project, since it will be necessary to continue supplying spare parts and conducting post-installation service to resolve breakdowns and so on, it will be necessary to conduct thorough liaison and coordination after the handover of equipment.

(4) Necessity for Dispatch of Engineers

Since high-level technology will be needed to install the Project equipment and conduct post-installation testing and adjustment, etc., it will be necessary to dispatch engineers from Japan to perform quality control, technical guidance and schedule control.

PBC employees have already acquired a certain level of operation and maintenance technology for existing analog broadcasting equipment, and there are no particular technical problems regarding maintenance of this equipment. However, since employees are not used to operating and maintaining the latest equipment models, it will be necessary for Japanese engineers to conduct technical guidance on operation and maintenance when installing the new equipment.

2-2-4-2 Implementation Conditions

(1) Implementation Conditions

Although there are numerous construction firms and electric works contractors and so on in Pakistan, there are no companies that possess the high-level technology needed to install the Project transmitter equipment. Therefore, when conducting the installation works, it will be necessary to dispatch engineers from Japan in order to conduct technical guidance, quality control and schedule control.

(2) Utilization of Local Equipment and Materials

In Pakistan, aggregate, cement and reinforcing bars, etc. for use in building upgrade works are available and are frequently adopted, although control and guidance are required with respect to quality and delivery dates. Therefore, when compiling the upgrade works implementation plan, locally available materials shall be procured as much as possible.

2-2-4-3 Scope of Works

The Japanese side will be responsible for the procurement and installation of transmitter equipment and the floor and wall renovation works that are intrinsically linked to installation, while the Pakistani side will be responsible for removing existing equipment and making the necessary preparations for the works. Table 2-2-6 shows the detailed scope of works on the Japanese and Pakistanis sides.

Table 2-2-6 Scope of Works

Item	Scope		Remarks
	Japanese Side	Pakistani Side	
1. Common items			
(1) Equipment procurement	○		Including forced cooling system for transmitter
(2) Transport to the Project site	○		
(3) Securing Cargo storage space or area for new equipment and materials in the Project site		○	
(3) Equipment installation works	○		
(4) Implementation of testing and training on the Project site	○		Conducting OJT training on the transmitter, equipment of the master control, system configuration, troubleshooting and maintenance for approximately one week respectively.
(5) Implementation of test broadcasts	(Advice)	○	Confirmation of broadcast operation through actual broadcasting for one day. Checking / Measurement of equipment and collection of necessary data.
2. Faqirabad Transmitting Station			
(1) Removal of existing equipment - Removal of existing transmitters and transmitting equipment - Removal of the outdoor transformer and other unnecessary facilities - Removal of other equipment not required in the Project Existing equipment outside the transmitter room targeted for renewal in the Project shall be removed.		○	This shall be finished before the start of works by the Japanese side
(2) Partial upgrading and repair of transmitting station building - Outside walls: Recoating of worn paint is needed - Ceiling: Repair is recommended - Roof: New application of a waterproof layer - Feeder: Reinforcing and repair of degraded parts of the feeder frame		○	Only the waterproofing works need to be finished by the start of works by the Japanese side. Feeder frame works will be carried out at the same time as the main works while broadcasts are suspended. Other items, such as recoating outside walls, will be implemented after the main works.
(3) Partial upgrading and repair of transmitting station building - Floor: Removal of existing tiles and raising of tiles - Floor cable pit cover - Walls: Prepare openings for new ventilation ducts - Partitions: Install panels for the new transmitter partition wall (panel: transformer incidental facilities and coating) - Chamber for intake air to the transmitter (blocks and mortar finish with coating) - Doors: Made from iron (outside doors shall be the dustproof type)	○		Floors will be finished using antistatic vinyl tiles.

Item	Scope		Remarks
	Japanese Side	Pakistani Side	
(4) Electrical works - Connection with transformer for new transmitter (11KW to 400W) - Cable connection from city power supply or emergency generator to the transformer - Appropriate maintenance of the emergency generator - Indoor lighting: Renewal (only in the rooms targeted for upgrading) - Preparing line and terminal for new ISDN codec in the control room.		○	This shall be finished by the start of works by the Japanese side. (However, the new distribution panel will be supplied by the Japanese side and will be the connection point between the Pakistani side works and Japanese side works).
3. PBC Islamabad Headquarters			
(1) Removal of existing equipment - Removal of equipment from news studios 1~4 - Removal of master control and talk studio equipment - Removal of other unnecessary instruments and cables, etc. not related to the - Preparing line and terminal for ISDN codec in the master control room		○	This shall be finished by the start of works by the Japanese side.
(2) Upgrading and repair of the station building deemed necessary by PBC		○	Ditto
(3) Necessary electrical works and supply of electricity to equipment		○	Ditto

Note: ○: Indicates the scope of responsibility regarding each item

2-2-4-4 Consultant Supervision

(1) Basic Policy of Consultant Supervision

The consultant has the obligation to organize a project team in charge of the Project affairs and to smoothly execute the implementation design and execution supervision work in accordance with the contents of the Government of Japan's grant aid cost estimation manual and the basic design.

The consultant will dispatch specialist engineers to coincide with the progress of the equipment installation works, onsite testing and adjustment works, etc., and it will guide and supervise the contractor and strive to ensure that schedule control, quality control, progress control and safety control are implemented based on the plan. Also, it has the obligation to implement pre-shipping inspections of the equipment and prevent any troubles from arising after the equipment has been transported.

The major points to bear in mind in the execution supervision and procurement supervision are described below.

1) Schedule control

The consultant will compare progress with the implementation schedule decided by the

contractor in the contract every month or every week in order to adhere to the delivery deadline given in the contract. In cases where delays are predicted, the procurement agent will warn the contractor and demand the submission and implementation of a plan of countermeasures. Comparison of the planned schedule and actual progress will mainly be based on the following items:

① Confirmation of works performance (plant manufacture and shipping performance)
② Confirmation of equipment delivery
③ Confirmation of yield and actual numbers of engineers, skilled workers and laborers, etc.

2) Quality and work progress control

Quality and work progress supervision will be carried out based on the following items to determine whether the procured equipment satisfies the required quality and progress stated in the contract documents. In cases where doubts arise over quality and work progress, the consultant will immediately demand that the contractor make amendments, revisions or corrections.

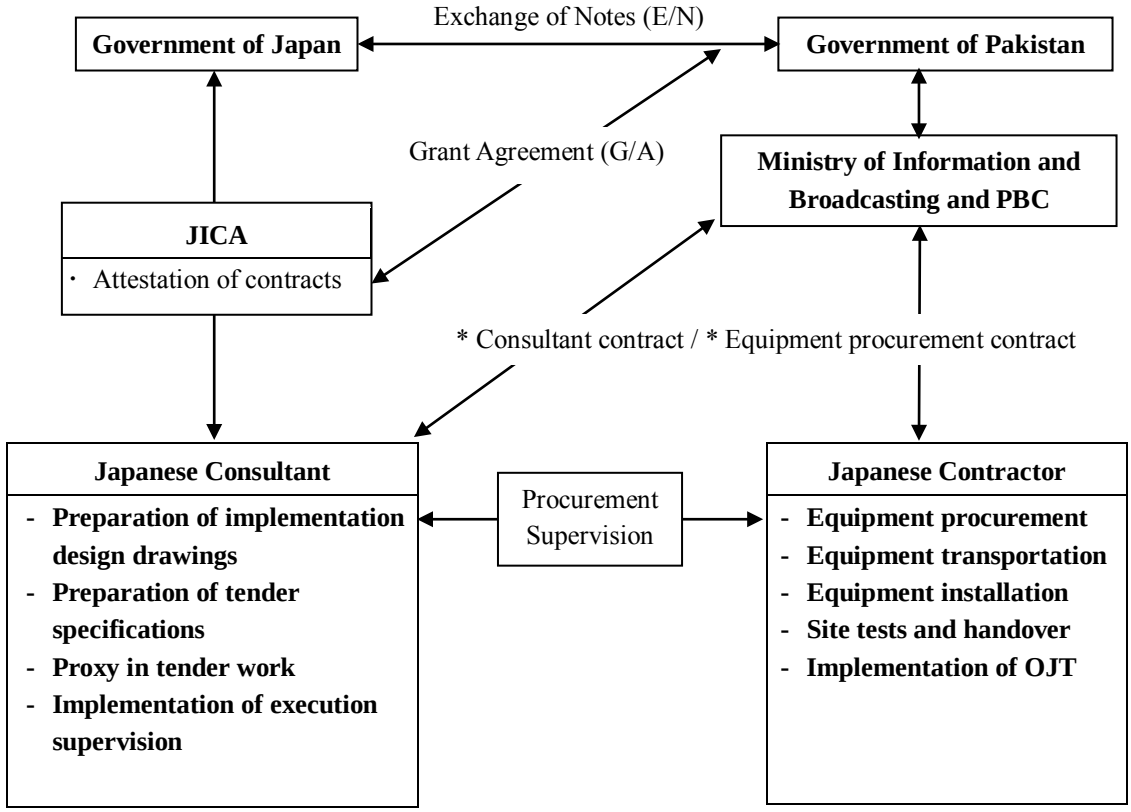
① Checking of equipment specifications
② Checking of shop drawings and specifications of equipment
③ Attendance of plant inspections of equipment and checking of plant inspection results
④ Checking of installation guidelines
⑤ Checking of trial operation, adjustment, test and inspection guidelines of equipment
⑥ Supervision of equipment installation works and witnessing of trial operation, adjustment and testing by the Pakistani side

3) Labor supervision

Discussions will be held and cooperation will be sought with responsible officers of the contractor and safety control will be exercised during the construction period in order to prevent the occurrence of industrial accidents on the site, injuries to third parties or any other accidents. Important points to consider in safety control on the ground are as follows.

① Establishment of safety control regulations and appointment of manager
② Planning of the works vehicles and construction machinery operating routes and thorough enforcement of safe driving
③ Encouragement of laborers to utilize welfare measures and vacations

Figure 2-2-5 shows the relationships between the parties involved in the Project.



*Note: The Consultant Contract and equipment procurement contract require attestation by JICA

Figure 2-2-5 Project Implementation Relationships

(2) Works Supervisor

The contractor will procure and deliver equipment and implement the installation works. Since the contractor will need to thoroughly ensure that the subcontractor complies with the works schedule, quality, progress and safety measures prescribed in the contract, it will dispatch engineers who have experience of similar projects in overseas countries to provide guidance and advice on the ground.

2-2-4-5 Quantity Control Plan

Pre-shipping inspections will be encouraged to make sure that the procured equipment complies with the technical specifications indicated in the tender documents. Moreover, during installation works on site, quality control will be carried out according to the execution control criteria indicated in the execution guidelines.

2-2-4-6 Procurement Plan

The equipment to be procured for the Project is not manufactured in Pakistan and will thus be procured from Japan or third countries in the case of some limited items.

2-2-4-7 Operational Guidance Plan

In order to enable the effective operation of the supplied equipment following the handover of the Project works, the technology for operating and maintaining the equipment to be procured and installed in the Project will be transferred to PBC during the installation works and trial operation period. Table 2-2-7 shows the detailed approach to transfer as envisaged at present.

Table 2-2-7 OJT Plan (Draft)

Subject	
I. Transmitter	(1) System composition of the transmitter at Faqirabad Transmitting Station (2) How to use measuring instruments (3) Routine inspections of transmitters (explanation and practical instruction) (4) Transmitter troubleshooting (5) Repairs and adjustments (6) Test to determine understanding 1 (completion adjudication 1)
II. Studio Equipment	(1) System composition of studio instruments in Islamabad Headquarters (2) How to use measuring instruments (3) Routine inspections of studio instruments (explanation and practical instruction) (4) Troubleshooting for studio instruments (5) Repairs and adjustments (6) Test to determine understanding 2 (completion adjudication 2)
III. Master Control Equipment	(1) System composition of master control equipment in Islamabad Headquarters (2) How to use measuring instruments (3) Routine inspections of master control equipment (explanation and practical instruction) (4) Troubleshooting for master control equipment (5) Repairs and adjustments (6) Test to determine understanding 3 (completion adjudication 3)
IV. Summary	(1) General understanding adjudication test (completion adjudication 4) (2) Issue of completion certificate

2-2-4-8 Implementation Schedule

The Project implementation schedule has been set as following Figure2-2-6 based on the grant aid cost estimation manual of the Government of Japan.

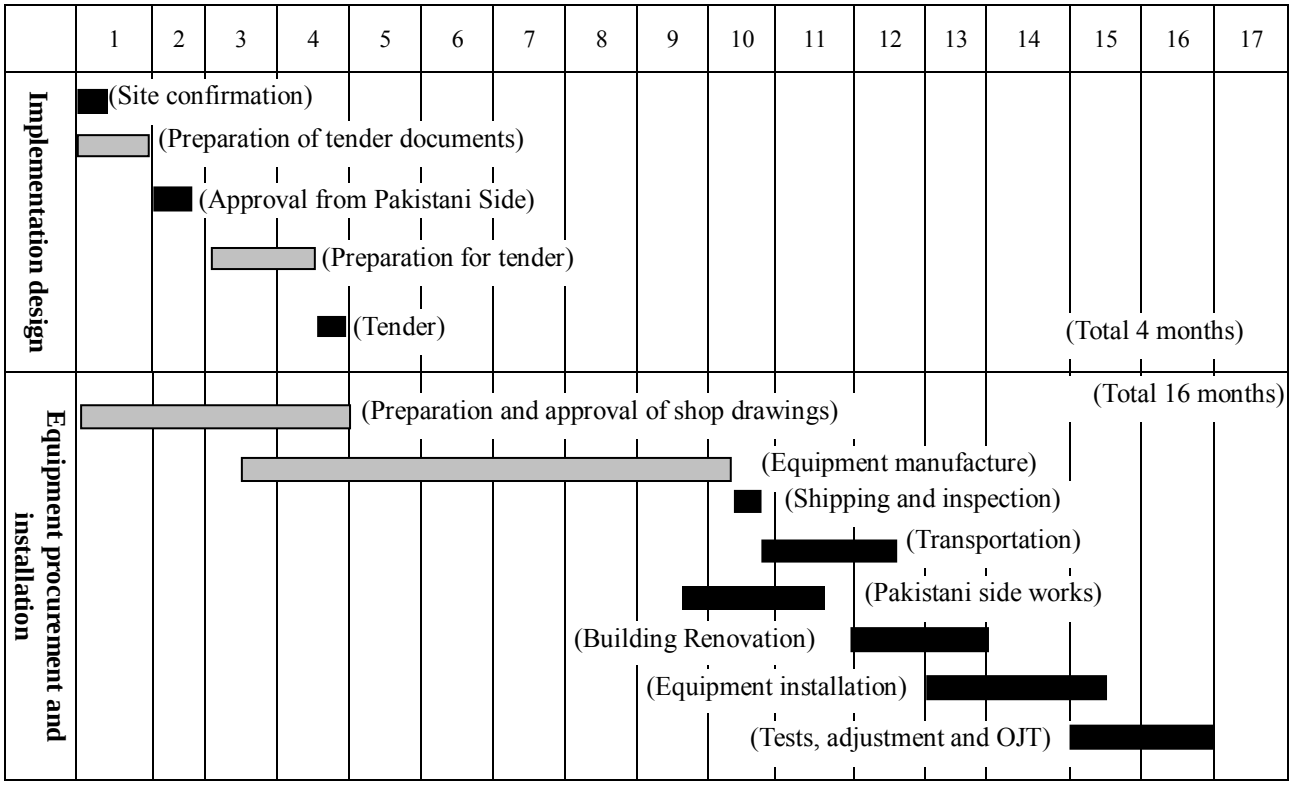


Figure 2-2-6 Project Implementation Schedule

2-3 Obligations of Recipient Country

2-3-1 Antenna Conditions

(1) Visual check of feeder line conditions, and rust and deformation of antenna pole

① As the main components of the towers have undergone zinc galvanizing, they have no rust, however, concerning the parts such as bolts and pins where coating has become worn, rust has already appeared and it is necessary to perform coating as soon as possible.

② Concrete has peeled and reinforcing bars are exposed on parts of feeder line pillars and it is necessary to carry out repairs.

Pin conditions

Bolt conditions

Feeder pillar's conditions

(2) Results field strength measuring

Comparison was carried out between the electric field intensity inferred from the output and the actually measured electric field in order to confirm the electrical performance.

As a result of field strength measuring at a point in Islamabad approximately 55 kilometers away from Faqirabad Transmitting Station (north latitude 33 degree 44 minutes 03 seconds 64, east longitude 73 degree 03 minutes 13 seconds 52, altitude 569 meters), a higher value than that inferred from output was confirmed, thereby indicating that the transmitter is operating normally.

Transmitting output and frequency band

Field strength measurement

(3) Summary

As a result of the above-mentioned joint survey with PBC, the antenna at Faqirabad Transmitting Station is deemed to be electrically useable and structurally sturdy, however, some degradation such as peeling of paint due to use over time can be observed. Accordingly,

since there is partial degradation of the antenna and it is likely that the time for overhaul (repainting and repairs such as replacement of fixtures and so on) is approaching, discussions will be held with the local side and the future repairs will be conducted upon making the following statement in the MD: "In the event where it becomes impossible to use the antenna, the Pakistani side will secure the necessary budget and immediately implement antenna renewal."

Furthermore, some of the insulators adopted on power supply lines are special shapes, and some of these have been damaged in storms and other natural disasters. Since these insulators were made in Yugoslavia and cannot easily be obtained now, it is possible this will impact maintenance. Upon investigating the feasibility of procuring such insulators at a Japanese maker, since it was confirmed that insulators can be procured, they will be included in the Project to expedite the maintenance.

Concerning repair of the concrete support pillars for the antenna feeder line, the necessary costs have been budgeted for as it has been found that local contractors can perform the works. The survey team has also proposed that the support pillars undergo seismic proofing.

2-3-2 Conditions of the Transmitting Station Building

The structure of Faqirabad Transmitting Station Building is made of reinforced concrete pillars, beams and walls, and the building is 38 years' old. Results of visual inspection and hammering inspection of building pillars are good, indicating there to be no problem in terms of structural strength, however, as the roof of the building has no waterproof layer (Photos 1 and 2). Part of the ceiling of the transmitter control hall has been replaced (Photo 3) and there is evidence of water leakage on the large beams in the transmitter room (Photo 4). For this reason, we requested the Pakistani side to carry out waterproofing works on the roof for protect transmitting equipment.

Photo 1: Conditions of the roof

Photo 2: the surfaces of the roof

Photo 3: Parts of replacement

Photo 4: Parts of rain water leakage

Additionally, the existing coating of exterior walls has become faded over the years. Since paint has been coated over existing concrete surfaces, this will be recoated for the purpose of protecting structural frames. Before recoating, the existing paint will be removed old coating and rust and make smooth surface.

2-3-3 Scope of Works on the Pakistani Side

The survey team explained to the Pakistani side that securing of the budget for the Pakistani scope of works is one of the preconditions for implementation of the Project, and it secured the Pakistani side's consent for this. The overall schedule was explained and the Pakistani side was urged to definitely implement its scope of works and secure the necessary budget. The Pakistani side will immediately commence the procedure (PC-1) to secure the necessary budget.

Table 2-3-1 shows the scope of works on the Pakistani side.

Table 2-3-1 Outline of the Pakistani Scope of Works

Item	Contents	Amount (1,000PKR)
General Matters		
1	Provision of information and data necessary for the Project	-
2	Swift uploading of equipment and materials procured for the Project at the port in Pakistan, and customs clearance and tax exemption procedures (including VAT exemption for locally procured items)	-
3	Waiver (or payment) of work permit fee (or enterprise tax and the like) for individuals (or companies) of Japanese nationals dispatched for procurement and installation of equipment and materials for the Project and related procedures	-
4	Fee for opening an account at an authorized foreign exchange bank in Japan and payment fee	-
5	All other expenses that are not covered by Japanese grant aid and are required for the execution of the Project	-
6	Appointment of professional engineers to transfer operation and maintenance techniques for the Project, confirmation of construction works during the construction period and observation	-

Item	Contents	Amount (1,000PKR)
	of quality inspection of equipment and materials	
7	Proper use and maintenance of the facilities and equipment constructed/procured with Japanese grant aid	-
Construction Works to be Conducted by the Pakistani Side		
Banking Arrangement (B/A)		54,300
Faqirabad Transmitting Station	1. Cost of removing and scrapping existing installations Existing transmitter and connecting cables, and other unnecessary equipment (to be completed by the start of transmitter installation by the Japanese side)	1,500
	2. Repair and mending costs Waterproofing of building and roof and repair of transmitting station walls (to be completed by the start of transmitter installation by the Japanese side; however, repainting of the transmitting station will be conducted after the works by Japan have started).	7,500
	4. Repair and strengthening of power lines and support pillars (during stoppage of the transmitter)	4,500
	5. Repainting of the transmitting station building (this can be done after the works by the Japanese side, however, it needs to be done as quickly as possible).	1,000
	6. Renewal of the transmitting station 11 kV system and in-station power source equipment (before installation of transmitter)	20,200
Islamabad HQ	Cost of removing and scrapping existing installations Master controller, studio equipment and connecting cables (to be completed by the start of master controller and studio equipment installation by the Japanese side)	1,000
	Total Amount	89,000

Concerning security for the Japanese engineers, the Pakistani side will be responsible for security at Faqirabad Transmitting Station. The Japanese side will be responsible for security during transfer from the accommodation site in Islamabad to Faqirabad Transmitting Station and security of the equipment in storage.

2-4 Project Operation Plan

2-4-1 Operation System

In order for PBC to fulfill its role as a public broadcaster, it will be necessary to procure and renew equipment based on PBC budget and plans. Accordingly, in the plan of maintenance for the equipment to be procured in the Project, consideration will be given to the timing of periodic renewals. Table 2-4-1 shows the maintenance plan.

Medium wave transmitter parts such as the fan unit and air filter that are constantly used and can be expected to soon become worn out will be replaced at intervals of one to three years. Meanwhile, fuses and bulbs for aircraft warning lights and so forth will be replaced as wear and breakages occur. The MW transmitter body and overall program inputting equipment will be renewed 10 years after going into service upon taking the depreciation period and technical innovation into consideration.

Table 2-4-1 Equipment Maintenance Plan

Exchange Timing	Target Parts
3 years	Air filter, cables, monitor, memory-related parts
When worn or broken	Fuses, surge absorber for insulating transformer, bulbs for aircraft warning lights, memory-related parts
Every 5 years	Mixer faders and monitors
After 10 years	MW transmitter body and program inputting equipment, etc.

2-4-2 Routine Inspections

Due to the technological innovations of recent years, electronic instruments have acquired greater reliability and durability; moreover, equipment troubles have become less frequent because fewer components are used. In view of this trend, maintenance inspection cycles for equipment are becoming longer in Japan.

However, in order to effectively utilize equipment over the long term, it is important to implement routine and periodic inspections without fail; and such inspections are especially important for agencies such as PBC which cannot conduct frequent equipment upgrades due to budget constraints. Therefore, it will be necessary to prepare the minimum necessary maintenance standards for routine and periodic inspections and prepare a setup for preventing equipment failures in advance. Table 2-4-2 shows the routine and periodic inspection items and necessary inspection instruments for the equipment to be procured in the Project.

Table 2-4-2 Equipment Inspection Items and Necessary Instruments

Inspection Contents	Inspection Item	Necessary Measuring Instruments
Routine inspection and start-up inspection	Visual check of meters and failure displays, etc.	Audio monitor
	Visual check of connection parts	Tool set
6 month inspection (characteristics test)	Characteristics inspection of audio instruments (frequency characteristics, S/N), distortion rate, level diagram	Distortion rate meter, signal generator and oscilloscope
	Power source and voltage measurements	Oscilloscope, tester, high voltage probe
1 year inspection (characteristics test)	Transmission frequency Antenna characteristics Receiving field intensity	Frequency meter Impedance bridge Electric field intensity meter

2-5 Project Cost Estimation

2-5-1 Initial Cost Estimation

The breakdown of the cost to be borne by Pakistani Side is JPY80.9 million in total. The cost of the Project is summarized separately for the portion to be borne by the Japanese side and the portion to be borne by the Pakistani side.

2-5-1-1 Costs to be borne by the Pakistani Side

Approximately PKR89,000,000 (equivalent amount of approximately JPY80.9 million)

Project Cost (Initial Cost) Item	First year	Second year	Million JPY
	Estimate Amount Million PKR		
1. Common items: Banking Arrangement Approximately 3.5% of the Project Cost	54.3	-	49.4
2. Faqirabad transmitting station	30	3.7	30.7
2.1 Removal of existing equipment	1.5	-	1.4
2.2 Partial upgrading and repair of transmitting station building(1) - Roof treatment of technical area - Suspended ceiling of transmitter hall - Replacement of windows and ventilators of transmitter hall	3.8	-	3.5
2.3 Partial upgrading and repair of transmitting station building((2) - Recoating outside walls of building	-	3.7	3.4
2.4 Reinforcing and repair of degraded parts of the feeder frame	4.5	-	4.1
2.5 Electrical connection works and upgrading of transmitting station 11kV power supply equipment	20.2	-	18.3
3. Islamabad Headquarters: Removal of existing equipment	1	-	0.9
Total (1+2+3)	85.3	3.7	
Grand Total (1+2+3)	89		81

2-5-1-2 Condition for estimation

1) Estimation point: May ~ October 2011
2) Exchange rate: 1 US$＝79.67 yen
   1 PKR=0.909 yen

2-5-2 Operation and Maintenance Cost

In order for PBC broadcasting station to be soundly operated into the future, it will be necessary to appropriately upgrade the equipment that is procured in the Project. Therefore, in addition to the maintenance of new and existing equipment, it will be necessary to compile a maintenance plan that also includes the periodic upgrading costs described in the next section.

2-5-2-1 Setting Criteria

The criteria for setting operating expenditure and revenue have been set as follows.

(1) Expenditure

The equipment to be procured in the Project will operate in 2015, and annual expenditure is estimated based on the assumption that a reserve fund is put aside every year with the aim of saving approximately half (approximately 500 million yen) of the required cost of upgrading the medium wave transmitter unit and program inputting equipment based on autonomous funding 10 years' later in 2025. The source of the reserve fund will be higher advertising income and reduced production costs. Concerning the production costs, the goal of self-help will be to limit any increase to around 0.9 percent. Table 2-5-1 shows the other expenditure items and budget setting method.

Table 2-5-1 Budget Setting

(Unit: 1,000 PKR)

Operating Expenditure Item	Budget Setting Method	Necessary Budget
Personnel expenses (maintenance and administration departments)	Adopt the average expenditure for the past 3 years (2008~2010). (Concerning the forecast indicators, it is intended to limit increase to 0.9 percent per year in consideration of the Ministry of Economy's GDP forecast of 3.6). Moreover, the cost will include the new recruitment of approximately 10 staff members for PBC Islamabad Headquarters and Faqirabad Transmitting Station.	1,458,631
Cost of repair parts (maintenance parts for the transmitter and repair of the MW antenna at Faqirabad Transmitting Station)	The costs for conducting equipment maintenance according to the Project operation and maintenance plan described in 3-3 will be secured, however, repair costs for broadcasting equipment generally tend to rise over time. Therefore, the forecast cost of purchasing repair parts for the transmitter has been set at 100,000 PKR every 3 years and 250,000 PKR every 5 years. Also, 6 million PKR is budgeted as the MW antenna repair cost in fiscal 2018.	340
Maintenance cost (building, vehicles, studio equipment, etc.)	Adopt the average amount of expenditure for the past 3 years (2008~2010)	11,660
Charges for use of telephones, satellite transmittal and ISDN Codec	Adopt the average amount of expenditure for the past 3 years (2008~2010) 60 million PKR is earmarked for ISDN Codec Line per year.	18,933
Utility expenses	Average expenditure over the past 3 years (2008~2010) is adopted. The annual electricity charge in the case where the transmitter at Faqirabad Transmitting Station is boosted from its present 150 kW to 500 kW will be approximately 30 million PKR.	236,570
Travel expenses	Adopt the average amount of expenditure for the past 3 years (2008~2010)	42,875
Other costs and overheads (insurance, etc.)	Adopt the average amount of expenditure for the past 3 years (2008~2010)	1,010,667

(2) Revenue

Estimation of operating revenue is estimated from sponsorship fees obtained by PBC from corporations and groups, advertising fees for spot advertisements (CM charges) and other revenue from hall rental and so on. Concerning increase in revenue, it is generally said that broadcasting revenue is proportional to GDP. According to the Governance of Pakistani, Finance Division, since it is forecast that GDP will grow at between 3.6~7.0 percent from 2011, the lower value of 3.6 percent has been adopted as the indicator here.

Table 2-5-2 Annual Revenue

(Unit: 1,000 PKR)

Revenue Item	Setting Method	Revenue (annual)
Radio broadcasting fees	Adopt the average amount of revenue for the past 3 years (2008~2010).	166
Other revenues	Adopt the average amount of revenue for the past 3 years (2008~2010).	187

(3) Revenue from Government Subsidies

It is estimated that the revenue from subsidies in fiscal 2007 can be counted on in future. Table 2-5-3 shows the annual subsidies. Currently, PBC personnel expenses are borne by the government so as a public servant, and any shortfalls are compensated by the Ministry of Information and Broadcasting following application and approval from the government.

Table 2-5-3 Annual Revenue from Subsidies

(Unit: 1,000 PKR)

Subsidy	Setting Method	Amount of Subsidy (annual)
Central government	Calculated from average expenditure from 2008 to 2010	1,882

2-5-2-2 Estimation Results

Table 2-5-4 shows the revenue and expenditure forecast up to the renewal of equipment in 10 years based on the above conditions. It can be seen that reserve fund for equipment renewal can be secured in 2020. Also, according to PBC, the necessary costs for renewing equipment in 10 years can be secured through reducing maintenance costs and increasing revenue from advertising.

Table 2-5-4 Estimated Operating Costs and Maintenance Costs of PBC Station

	Faqirabad Transmitting Station	Project completion	1	2	3	4	5	6	7	8	9	10
No	Item	2015	2016	2017	2018	2019	2020	2021	2022	2023	2024	2025
A.	Operating revenue											
	Advertisement fees	166,667	173,500	180,614	188,019	195,727	203,752	212,106	220,802	229,855	239,279	249,090
	Radio broadcasting fees	187,113	187,113	187,113	187,113	187,113	187,113	187,113	187,113	187,113	187,113	187,113
	Subtotal A	353,780	360,613	367,727	375,132	382,840	390,865	399,219	407,915	416,968	426,392	436,203
B	Operating expenditure											
	Personnel expenses and program production costs	1,458,631	1,459,944	1,461,258	1,462,573	1,463,889	1,465,207	1,466,525	1,467,845	1,469,166	1,470,489	1,471,812
	Repair parts costs (Faqirabad Transmitting Station medium wave transmitter maintenance parts)	340	340	340	7,022	340	2,500	1,022	340	340	1,022	2,500
	Maintenance costs (building, vehicles, radio equipment, etc.)	11,660	11,660	11,660	4,978	11,660	9,500	10,978	11,660	11,660	10,978	9,500
	Telephone charges, satellite transmission fees	18,933	18,933	18,933	18,933	18,933	18,933	18,933	18,933	18,933	18,933	18,933
	Utility costs	236,570	236,570	236,570	236,570	236,570	236,570	236,570	236,570	236,570	236,570	236,570
	Travel expenses	42,875	42,875	42,875	42,875	42,875	42,875	42,875	42,875	42,875	42,875	42,875
	Insurance and other general expenses	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667	1,010,667
	Reserve fund (equipment renewal costs)	25,000	25,000	77,500	30,000	77,500	30,000	30,000	77,500	77,500	25,000	25,000
	Subtotal B	2,804,676	2,805,989	2,859,803	2,813,618	2,862,434	2,816,252	2,817,570	2,866,390	2,867,711	2,816,534	2,817,857
C	Operating earnings (A - B) = C	-2,450,896	-2,445,376	-2,492,076	-2,438,486	-2,479,594	-2,425,386	-2,418,351	-2,458,475	-2,450,743	-2,390,141	-2,381,654
D	Revenue from government subsidies	2,450,896	2,445,376	2,492,076	2,438,486	2,479,594	2,425,386	2,418,351	2,458,475	2,450,743	2,390,141	2,381,654
	Subtotal D	2,450,896	2,445,376	2,492,076	2,438,486	2,479,594	2,425,386	2,418,351	2,458,475	2,450,743	2,390,141	2,381,654
E	Balance after revenue from subsidies (C - D)	0	0	0	0	0	0	0	0	0	0	0
F	Aggregate reserve fund	25,000	50,000	127,500	157,500	235,000	265,000	295,000	372,500	450,000	475,000	500,000

Chapter 3 Project Evaluation

3-1 Preconditions

- Obligation of recipient country will be implemented smoothly.
- ECNEC will approve PC-1 for the Project

3-2 Necessary Inputs by Recipient Country

- Repair and renovation of the building of transmitting station should be completed by the start of construction borne by the Japanese side
- Removal of the equipment of Islamabad headquarters and the transmitting station should be completed by the start of construction borne by Japanese side.
- Electrical connection works in the transmitting station should be completed by the start of construction borne by Japanese side.
- Enough electric power to operate the transmitting station and the studio systems will be supplied stably.
- The budget for purchasing spare parts and personnel as maintenance such as daily checking will be secured successfully.

3-3 Important Assumptions

- Policy on broadcasting sector in Pakistan will not be changed.
- Natural disasters such as earthquake will not occur.
- Incidents such as terrorist attacks will not happen.

3-4 Project Evaluation

3-4-1 Relevance

The Project will be deemed to have high relevance as an aid undertaking because it will contribute to the achievement of the national development policy in Pakistan and the stability of the border with Afghanistan.

(1) Beneficiaries of the Project

The beneficiaries of the Project will be approximately 64 million residents in Pakistan and 3.5 million residents in Afghanistan who live in the coverage area of the Project. These people will enjoy radio broadcasting stability after the Project is completed. Moreover, KP and FATA, which are areas covered by the Project, are identified as an area of poverty.

(2) Contribution to the stability of people's daily lives

The current equipment has been operated by regular maintenance although the equipment was installed forty years ago. There is a high possibility that the equipment will break down in the

near feature. It is difficult to obtain any spare parts because they are no longer manufactured. It is expected that the people who live in the coverage area will be affected if the transmitting station shuts down due to breakdown of the equipment. The realization of production and broadcasting stability through renovation of the equipment is thereby to contribute to the improvement of people's lives and the stability of the border with Afghanistan.

(3) Contribution to the national development plan in Pakistan

The purpose of the PBC is to contribute to the public interest through broadcasting topics of education, information, enlightenment and culture in Vision2030 and Millennium Development Goals as medium and long term development national plan in Pakistan and thereby the Project is deemed to contribute to the national development plan in Pakistan.

(4) Japan Grand Aid Scheme

Stabilization of the border region including KP and the FATA is treated as an important issue in Japan's project deployment program for Pakistan and the New Strategy for Dealing with the Threat of Terrorism (2009). The Project is thus deemed to have high consistency with the aid policy and principles of the Government of Japan.

(5) Necessity and superiority of using Japanese technology

The equipment to be installed in the Project was manufactured in the former Soviet Union, United States, European countries and Japan. However, apart from the Japanese products, not many makers have the post-sales service setups to respond to accidents and repairs and procure spare parts and so on; moreover, not many products can beat Japanese products in terms of durability. Therefore, there is deemed to be necessity and technical superiority in selecting Japanese products to conduct the equipment renewal.

3-4-2 Effectiveness

(1) Quantitative Effects

The transmitting power will recover and each spare part will increase in durability after replacement of the equipment in Faqirabad Transmitting Station. It will realize long hours broadcasting though the hour of broadcasting has recently been only five hours.

Hours worked of editing will be abbreviated after the equipment of studios and master control room in Islamabad Headquarters transition from an analog to digital. This will make editing works more efficient and increase numbers of program. Therefore following effectiveness will be expected.

1) Number of listeners in the coverage area

In the case where transmitting power of Faqirabad Transmitting Station is increased from the present 150 kW to 500 kW following equipment renewal, the reception field strength of 60

dBμ(V/m) that is anticipated based on ITU-R data will expand from the present 240 km to 300 km. Moreover, 60 dBμ(V/m) indicates the strength of radio waves that can be clearly heard without any noise. Coverage of the reference value is based on measured data from 2011.

Number of listeners in Pakistan who can receive the radio will increase with expansion of the coverage area. On the other hand, listeners in Afghanistan is expected approximately 3.5 million people.

Concerning the target value, improved coverage has been calculated based on ITU-R data. Concerning the population distribution, the estimated populations reached by the reference value and target value have been calculated upon quoting data from the Pakistan Statistical Year Book 2011 and Afghanistan Statistical Year Book 2010-2011.

Indicator	Reference Value (2011)	Target Value (2015)
Number of listeners	Approx. 36 million people	Approx. 64 million people

*the both estimated population is only for Pakistani side excluding Afghanistan side.

2) Broadcasting time

As the reference value, the daily broadcasting time in 2011 of five hours will be adopted, while the 14 hours per day that was requested by PBC will be adopted as the target value following equipment renewal.

Indicator	Reference Value (2011)	Target Value (2015)
Broadcasting time	5 hours/day	14 hours/day

(2) Qualitative Effects (Project overall)

It is expected to be a stable transmission and expansion of coverage areas including KP and FATA after the transmitters are replaced and spare parts is possible to be procured in Faqirabad Transmitting Station. Replacement of studios equipment in Islamabad Headquarters will make possible the long hours broadcasting as well as improvement of sound quality and efficient of recording and editing because of transition from an analog to digital. This will thereby realize efficient of program and enhancing contents of program.

PBC will possible to produce recording program which needs works of recording and editing. For instance, news show is the program focused on a crime scene or person who is much talked about, and feature program is the program which describes and discusses social issue. Quality of programs will be improved as a media due to providing a wide variety of program services.

Therefore both improvement of program quantity and expansion of coverage including KP and FATA will contribute not only improving quality of life but also stabilization of regional community.

Appendices

1. Member List of the Study Team

Member List of the Study Team

Name	Work Assignment	Position
Mr. Toshiya SATO	Leader	Senior Representative, Pakistan Office, Japan International Cooperation Agency (JICA)
Mr. Yasumichi ARAKI	Leader	Director, Grant Aid Project Management Division2, Financing Facilitation and Procurement Supervision Department Japan International Cooperation Agency (JICA)
Mr. Yoshihiro OZAKI	Project Management 1	Pakistan Office, Japan International Cooperation Agency (JICA)
Ms. Hiroko WATANABE	Project Management 2	Pakistan Office, Japan International Cooperation Agency (JICA)
Mr. Tsuyoshi KANO	Project Management	Assistant Director, Transportation and ICT Division2, Transportation and ICT Group, Economic Infrastructure Department, Japan International Cooperation Agency (JICA)
Mr. Kiyofusa TANAKA	Chief Consultant / Broadcasting Planning	Yachiyo Engineering Co., Ltd.
Mr. Masuo WADA	Broadcasting Equipment Planning	Yachiyo Engineering Co., Ltd.
Mr. Tetsuya Ota	Studio Equipment Planning	Yachiyo Engineering Co., Ltd.
Mr. Shinichiro Sato	Facility Renovation Planning	Yachiyo Engineering Co., Ltd.
Mr. Takashi NAKAMURA	Procurement / Cost Estimation	Yachiyo Engineering Co., Ltd.
Ms. Maki UCHIYAMA	Social Condition Research	Yachiyo Engineering Co., Ltd.

2. Study Schedule

The Project for the Rehabilitation of Radio Pakistan Medium Wave Transmitting Network

No.	Date		Members of the Team							Stay at
			JICA/Araki	Tanaka	Wada	Ota	Satoh	Nakamura	Uchiyama	
1	12-Oct	Wed		Trip[Narita 11:00 → Bangkok 15:35, JL717] Trip[Bangkok 19:00 → Islamabad 22:10, TG350]						Islamabad
2	13-Oct	Thu		・JICA Pakistan office and submitting Inception report and questionnaire ・Courtesy call to Pakistan Broadcasting Cooperation(PBC) and then, submitting and explanation of Inception report and questionnaire ・Meeting with sub-contractor and conclude a contract						
3	14-Oct	Fri		[AM] Survey of Fakirabad transmitting station						
4	15-Oct	Sat		・Internal meeting and sorting of Data and information collected						
5	16-Oct	Sun		・ Internal meeting and sorting of Data and information collected						
6	17-Oct	Mon		・Survey of field strength measuring at PBC Broadcasting House in Islamabad ・Visit to and meeting with USAID			・Survey of PBC Broadcasting House in Islamabad		・Meeting of questionnaires with sub-contractor	
7	18-Oct	Tue		・Survey of PBC Broadcasting House in Islamabad					・Survey of social conditions	
8	19-Oct	Wed		・Survey of Murree Relay Station			・Survey of PBC Broadcasting House in Islamabad		・Survey of Murree Relay Station	
9	20-Oct	Thu		・Survey of Faqirabad Transmitting Station					・Survey of social conditions	
10	21-Oct	Fri		・Survey of Faqirabad Transmitting Station					・Survey of social conditions	
11	22-Oct	Sat		・ Internal meeting and sorting of Data and information collected						
12	23-Oct	Sun		・ Internal meeting and sorting of Data and information collected						
13	24-Oct	Mon		・Discussion on technical subject with PBC ・Collection of Questionnaires ・Making a field report				・Market survey ・Collection of price quotations from construction companies	・ Summary of Questionnaires	
14	25-Oct	Tue		・Discussion on technical subject with PBC ・Making a field report and supplement Survey				・Market survey ・Collection of price quotations from construction companies	・Discussion with program production section of PBC	
15	26-Oct	Wed		・Discussion on technical subject with PBC ・Making a field report and supplement Survey	Survey of Faqirabad Transmitting Station (preliminary plan)	・Discussion on technical subject with PBC ・Making a field report and supplement Survey	Survey of Faqirabad Transmitting Station (preliminary plan)		・ Summary of Questionnaires	
16	27-Oct	Thu		・Discussion on technical subject with PBC ・Making a field report and supplement Survey					・Analysis of Questionnaires	
17	28-Oct	Fri		[AM] Discussion on technical subject with PBC [PM] Making a field report and supplement Survey					・Analysis of Questionnaires	
18	29-Oct	Sat		・Discussion on technical subject with PBC ・Making a field report and supplement Survey						
19	30-Oct	Sun		・ Internal meeting and sorting of Data and information collected						
20	31-Oct	Mon	Trip[Narita → Islamabad]	・Discussion on technical subject with PBC ・Making a field report and supplement Survey						
21	1-Nov	Tue	・Meeting with JICA Pakistan office ・Courtesy call to Ministry of Information and Broadcasting and PBC Headquarters and Discussion on M/D with PBC ・Visit to PBC Broadcasting House in Islamabad							
22	2-Nov	Wed	・Discussion on M/D with PBC ・Conclude M/D with PBC (Tentative)							
23	3-Nov	Thu	・Visit to Faqirabad transmitting station and Murree relay station							
24	4-Nov	Fri	[AM] Conclude M/D with EAD (Economic Affairs Division) [PM] Report to Embassy of Japan in Pakistan and JICA Pakistan office Trip [Islamabad 23:35 → Bangkok 06:20 TG350]							on Flight
25	5-Nov	Sat	Trip[Bangkok 08:15 → Narita 16:05, JL708]							

Schedule for Explanation of Preparatory Survey Report

No.	Date		Member					Stay at
			JICA	JICA	Chief Consultant/ Broadcasting Plan	Broadcasting Equipment Plan	Procurement / Cost Estimation	
			Sato	Kano	Tanaka	Ota	Nakamura	
1	February 27, 2012	Mon			Trip[Narita 10:50 → Bangkok 16:00 , JL717] Trip[Bangkok 18:50 → Islamabad 22:25 , TG349]			Islamabad
2	February 28, 2012	Tue	・Meeting at JICA office		・Courtesy call to EOJ ・Meeting at JICA office ・Explanation of draft report at PBC HQ			
3	February 29, 2012	Wed			・Discussion M/D ・Comfirmation of Survey and reporting at PBC HQ			
4	March 1, 2012	Thu			・Confirmation of Survey Project to PBC HQ and Faqirabad Transmitting Station			
5	March 2, 2012	Fri			・Internal Meeting and supplement survey (PBC HQ)			
6	March 3, 2012	Sat			・Internal Meeting and supplement survey			
7	March 4, 2012	Sun		Trip[Afghanistan →Islamabad 15:00]	・Internal Meeting and supplement survey			
8	March 5, 2012	Mon	・Meeting at JICA office	・Meeting at JICA office ・Confirmation of the survey and reporting to the draft report ・Discussion on M/D				
9	March 6, 2012	Tue		・Confirm survey at Faqirabad Transmitting Station				
10	March 7, 2012	Wed	・Meeting at JICA office	・Discussion on M/D-2 ・Meeting at JICA Office				
11	March 8, 2012	Thu	・Sign to M/D with PBC ・Sign to M/D with EAD					
12	March 9, 2012	Fri	・Report to JICA ・15:00 Report to EOJ	・Report to JICA ・15:00 Report to EOJ Trip[Islamabad 23:35 →Bangkok 06:20 , TG350]				on Flight
13	March 10, 2012	Sat		Trip[Bangkok 08:15→Narita 16:05 , JL708]				

3. List of Parties Concerned in the Recipient Country

3. List of Parties Concerned in the Recipient Country

Name of Organization	Position
Pakistan Broadcasting Cooperation	
Mr. Murtaza Solangi	Director General
Mr. N.H. Rashdi	Director Engineering
Mr. Mubasher Ahmad Majoka	Controller
Mr. Ghulam Nabi Mangrio	Finance Director
Mr.Ghulam Mujaddid	Technical Advisor
Mr. Iftikhar Ahmad	Studio & Master control Manager
Mr. Kamuran Saeed	Deputy Controller
Mr. Nauman Akhatar Jarral	Engineering Manager
Ms. Khalida Nuzhat	Deputy Enroller (Producer)
Mr. Ghani-ve-Rehmar	Senior Producer
Mr. Muhammad Gultas	Project Coordinator
Mr. Saeed Ullah Khan	Producer
Mr. Ghani-ur-Rahman	Senior Producer
Mr. Muhammad Arif	IT Person
Mr. Monzoor Ali Tanha	Controller Home Services
Mr. Mahmood-UL-Hassan Akhtar	Controller (Personnel)
Mr. Saeed Ullah Khan Mahsud	Producer
Mr. Abdul Waheed Sheikh	Deputy Controller
Mr. M.Farooq Malana	Administrative Officer
Ministry of Information and Broadcasting	
Mr. Mustaeen Ahmad Albi	Section Officer
Mr. Muhammad Usman	Project manager
Economic Affairs Division	
Mr. Waqar Hussain Abbasi	Deputy Secretary

Faqeerabad Transmitting Station

Mr. Fazal Rahim	Controller
Mr. Tahir Mansoor	Deputy Controller
Mr. Liaqat Mohammed Minshas	Deputy Controller
Mr. Naeem Ahwaz	Engineering Manager
Mr. Zahid Naseem	Engineering Manager
Mr. Nigannad Gefan	Seinor Broadcast Engineer
Mr. Arshad Hassain	senior Store Officer
Mr. Mohammed Anwas Minhas	Workshop Superintend

Murree Relay Station (Murree PBC)

Mr. Naeem Ahmed Abbasi	Engineering Manager
Mr. Habib -ur-Rehman	Senior Broadcast Engineer

Rawalpindi High Power Transmitter Station

Mr. Tauweez Ahmad	Senior Broadcast Engineer
Mr. Yasir Mahmmod	Senior Broadcast Engineer
Mr. Cauirau Mahamood	Supervisor
Mr. Mohammad Seziq	Engineering Manager

USAID

Mr. Asim Aziz	Activity Manager
Mr. Muhammad Ashraf Qureshi	Consultant

JICA Pakistan Office

Mr. Toshiya Sato	Senior Representative
Mr. Yoshihiro Ozaki	Representative
Ms. Hiroko Watanabe	Project Formulation Advisor
Mr. Arshad M. Abbasi	Programme Officer

4. Minutes of Discussions

MINUTES OF DISCUSSIONS ON THE PREPARATORY SURVEY ON THE PROJECT FOR REHABILITATION OF PAKISTAN MEDIUM WAVE RADIO BROADCASTING NETWORK IN THE ISLAMIC REPUBLIC OF PAKISTAN

In response to a request from the Government of the Islamic Republic of Pakistan (hereinafter referred to as " Pakistan "), the Japan International Cooperation Agency (hereinafter referred to as "JICA"), in consultation with Government of Japan, decided to conduct a Preparatory Survey for Outline Design (hereinafter referred to as "the Survey") on the Project for Rehabilitation of Pakistan Medium Wave Radio Broadcasting Network (hereinafter referred to as "the Project"), JICA sent the Preparatory Survey Team for Outline Design (hereinafter referred to as "the Team") to Pakistan. The Team is headed by Mr. ARAKI Yasumichi and is scheduled to stay in the country from Oct 12 to Nov 4, 2011.

The Team held a series of discussions with the officials of Pakistan and conducted a field survey at the Project area. In the course of the discussions, both sides have confirmed the main items described in the attached sheets. The Team will proceed to further works and prepare the Preparatory Survey Report.

Islamabad, 2nd November, 2011

Mr. Araki Yasumichi
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Mr. Murtaza Solangi
Director General
Pakistan Broadcasting Corporation

Mr. Jamil Anwar
Joint Secretary (ADB/Japan)
Economic Affairs Division
Government of Pakistan

ATTACHMENT

1. **Objective of the Project**

The objective of the Project is to provide stable national radio broadcasting service in Khyber-Pakhtunkhwa Province and FATA through the rehabilitation of medium wave radio broadcasting network.

2. **Project Sites**

The Project sites are located in Faqirabad and Islamabad shown in Annex 1.

3. **Responsible and Implementing Organizations**

The responsible and implementing organization of the Project is Pakistan Broadcasting Corporation (hereinafter referred to as "PBC"). The organization charts are shown in Annex 2.

4. **Items requested by the Government of Pakistan**

As a result of the discussions, the items described in Annex 3 were finally requested by the Pakistani side with the priority.

The both sides confirmed that the appropriateness of the request would be examined in accordance with the further studies and analysis in Japan and the final components of the Project would be decided by the Japanese side from the viewpoint of necessity, technical and financial viability, sustainability and cost-effectiveness. Therefore, Pakistani side understands that all requested items, as listed in Annex 3, may not be accepted as a final component of the Project.

5. **Japan's Grant Aid Scheme**

5-1. The Pakistani side has shown a full understanding to the Japan's Grant Aid Scheme explained by the Team, as described in Annex 4 and 5.

5-2. The Pakistani side will take the necessary measures, as described in Annex 6, for smooth implementation of the Project, as part of a condition for the Japanese Grant Aid to be implemented.

6. **Environmental Considerations**

Pakistani side explained that there is no necessary environmental consideration procedure because the components of the Project are limited to installation of equipment.

7. **Schedule of the Study**

7-1. JICA will prepare the draft final report including cost estimation in English and dispatch a team to Pakistan in order to explain its contents to Pakistan side around March 2012. However, Japanese side will furnish cost estimation of the Project to Pakistani side in February 2012 to ensure timely preparation and submission of PC-I.

7-2. If the contents of the draft final report are accepted in principle by the Pakistani side,

JICA will complete the final report including cost estimation in English and send it to Pakistan around May 2012.

7-3. The Pakistani side understood that execution of the Preparatory Survey does not imply the Japanese Government's commitment of the Project implementation.

8. Other Relevant Issues

8-1. Acceptance of the Inception Report

The Team explained the Inception Report and the Pakistani side accepted it as a basis of the Preparation Survey.

8-2. Security arrangement

The Pakistani side will take all possible measures to ensure the safety of the concerned people during the Survey.

In addition, the Pakistani side agreed that necessary measures such as deployment of the security guards on the project site all day will be arranged by PBC. In this regard, PBC will take up the matter with the concerned authorities and seek their cooperation for provision of security arrangements to Japanese personnel during their stay and travel in Pakistan, if the Government of Japan decides to approve the Project implementation.

8-3. Approval of PC-I

The Pakistani side promised to have a responsibility to take a necessary procedure to approve PC-I by the Central Development Working Party (CDWP), or the Executive Committee of National Economic Council (ECNEC) in case total amount of the project cost will be over one billion Pakistan Rupees. Japanese side strongly requested Pakistani side that PC-I should be approved by June, 2012. In response to that, Pakistani side agreed to make the best efforts to manage it.

Both sides also agreed that PC-I will be formulated independently by Pakistani side, and Japanese side will cooperate to provide all necessary information for formulating PC-I.

8-4. Relationship between the Project and USAID Project

The Pakistani side explained the scope and contents of USAID project in Peshawar transmitting station to the Team. Pakistani side also emphasized that as the Peshawar transmitting station is one of radio outlets and broadcasts a different program from the national broadcasting program, there is no duplication between the scope of USAID project and the scope of the Project.

8-5. Renovation work for Faqirabad Transmitting Station

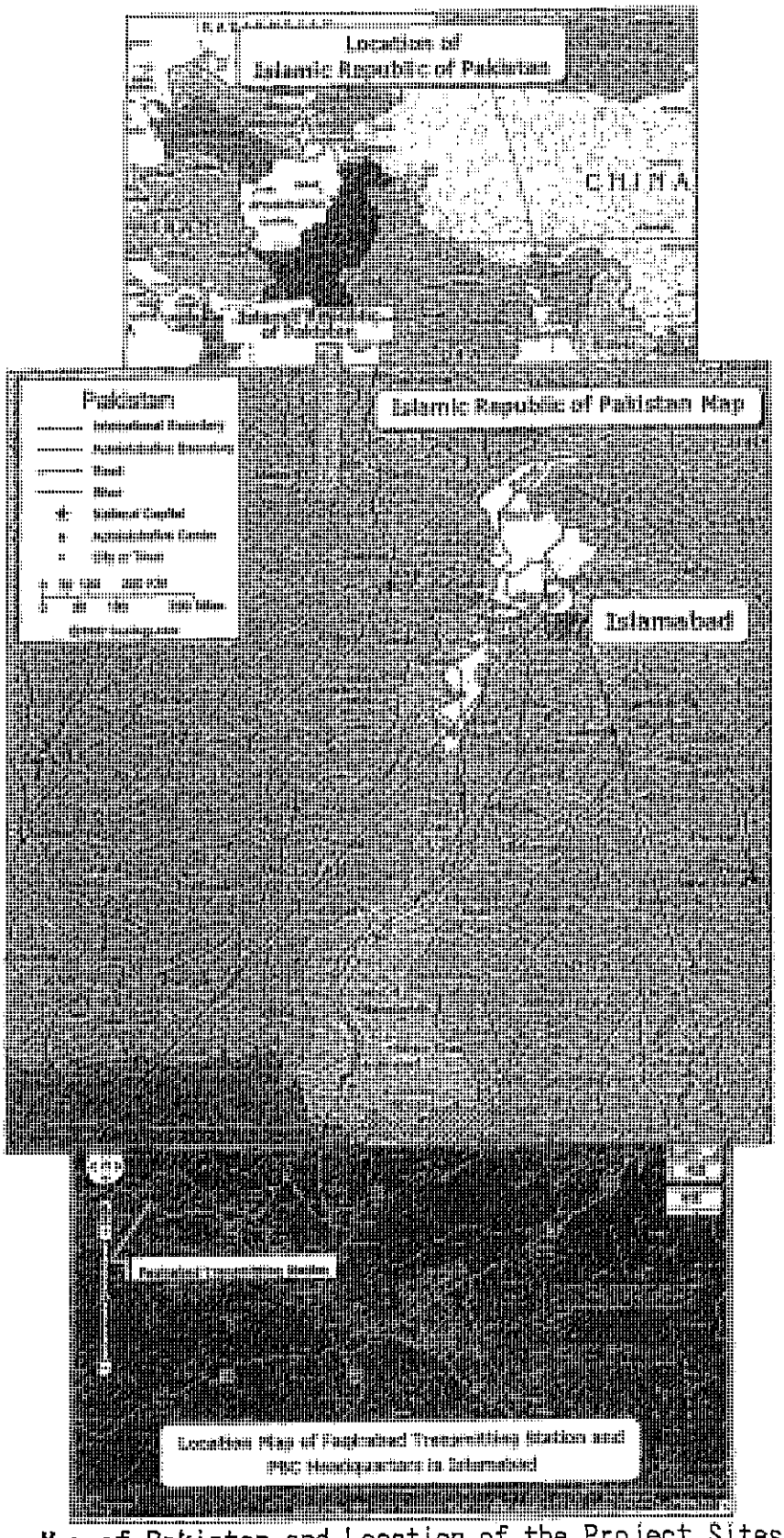
The Pakistani side understood the necessity of renovation works in Faqirabad transmitting station and agreed that following three items will be done by their own budget and responsibility during the installation period of the equipment.

a) Repairing work for walls and water proof of the roof on the transmitter building
b) Repairing work for the feeder pillars
c) Dismantling and removal of existing 500kW transmitter, transformers and other equipment

8-6. Proper maintenance for antenna of Faqirabad transmitting station

Both sides confirmed that the antenna of Faqirabad transmitting station is electrically well-functioning, but there are some structural problems such as rust on the steel bolts. The Team requested the Pakistani side to implement proper maintenance. The Pakistani side promised to properly maintain the antenna and submit a maintenance plan to the Team by the end of January 2012. Furthermore, the Team requested to PBC to take all possible measures to repair/replace the antenna, in case the antenna does not function in the future.

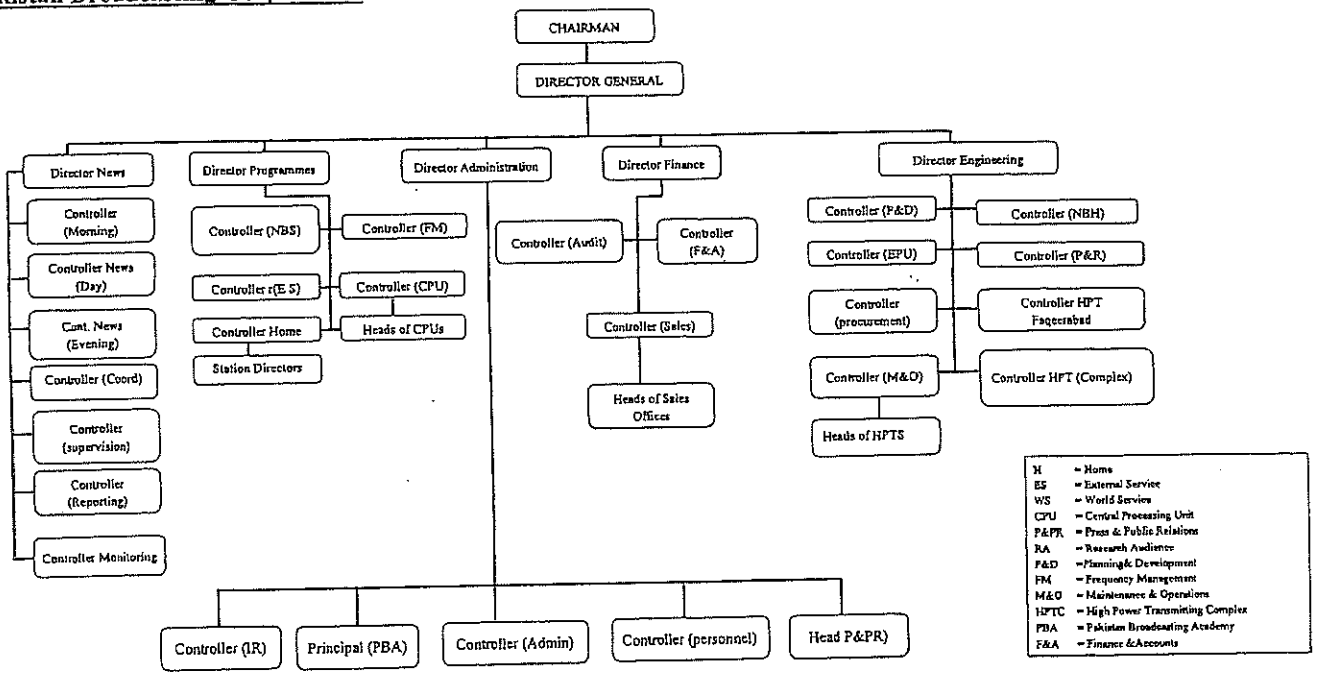
Annex-1



Map of Pakistan and Location of the Project Sites

Annex-2 Organization Chart of PBC

Organization Chart
Pakistan Broadcasting Corporation



Annex-4

Annex-3

Items Requested by Pakistan Side

Item	Description	Q'ty	Priority
I.	Faqirabad Transmitting Station		
1.	500kW MW Transmitter (250kW+250kW Combining)	1Set	A
2.	Auxiliary Equipment	1Set	A
3.	Spare Parts	1Set	A
4.	Measuring Equipment for maintenance	1Set	A
5.	ISDN Codec (1 Link : Islamabad - Faquirabad)	1Set	A
6.	Installation Work & Installation Materials	1Set	A
II.	PBC Headquarter		
1.	On Air Studio System	2Sets	B
2.	Production Studio System	2Sets	B
3.	Editing System	1Set	B
4.	Master Control System	1Set	B
5.	Measuring Equipment	1Set	C
6.	Installation Work & Installation Materials	1Set	B

Annex-4

JAPAN'S GRANT AID

The Government of Japan (hereinafter referred to as "the GOJ") is implementing the organizational reforms to improve the quality of ODA operations, and as a part of this realignment, a new JICA law was entered into effect on October 1, 2008. Based on this law and the decision of the GOJ, JICA has become the executing agency of the Grant Aid for General Projects, for Fisheries and for Cultural Cooperation, etc.

The Grant Aid is non-reimbursable fund provided to a recipient country to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for its economic and social development in accordance with the relevant laws and regulations of Japan. The Grant Aid is not supplied through the donation of materials as such.

1. Grant Aid Procedures

The Japanese Grant Aid is supplied through following procedures :

- ·Preparatory Survey
  - The Survey conducted by JICA
- ·Appraisal &Approval
  - -Appraisal by the GOJ and JICA, and Approval by the Japanese Cabinet
- ·Authority for Determining Implementation
  - -The Notes exchanged between the GOJ and a recipient country
- ·Grant Agreement (hereinafter referred to as "the G/A")
  - -Agreement concluded between JICA and a recipient country
- ·Implementation
  - -Implementation of the Project on the basis of the G/A

2. Preparatory Survey

(1) Contents of the Survey

The aim of the preparatory Survey is to provide a basic document necessary for the appraisal of the Project made by the GOJ and JICA. The contents of the Survey are as follows:

- Confirmation of the background, objectives, and benefits of the Project and also institutional capacity of relevant agencies of the recipient country necessary for the implementation of the Project.

- Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, financial, social and economic point of view.
- Confirmation of items agreed between both parties concerning the basic concept of the Project.
- Preparation of a outline design of the Project.
- Estimation of costs of the Project.

The contents of the original request by the recipient country are not necessarily approved in their initial form as the contents of the Grant Aid project. The Outline Design of the Project is confirmed based on the guidelines of the Japan's Grant Aid scheme.

JICA requests the Government of the recipient country to take whatever measures necessary to achieve its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization of the recipient country which actually implements the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country based on the Minutes of Discussions.

(2) Selection of Consultants

For smooth implementation of the Survey, JICA employs (a) registered consulting firm(s). JICA selects (a) firm(s) based on proposals submitted by interested firms.

(3) Result of the Survey

JICA reviews the Report on the results of the Survey and recommends the GOJ to appraise the implementation of the Project after confirming the appropriateness of the Project.

3. Japan's Grant Aid Scheme

(1) The E/N and the G/A

After the Project is approved by the Cabinet of Japan, the Exchange of Notes(hereinafter referred to as "the E/N") will be singed between the GOJ and the Government of the recipient country to make a pledge for assistance, which is followed by the conclusion of the G/A between JICA and the Government of the recipient country to define the necessary articles to implement the Project, such as payment conditions, responsibilities of the Government of the recipient country, and procurement conditions.

(2) Selection of Consultants

In order to maintain technical consistency, the consulting firm(s) which conducted the Survey will be recommended by JICA to the recipient country to continue to work on the Project's implementation after the E/N and G/A.

(3) Eligible source country

Under the Japanese Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased. When JICA and the Government of the recipient country or its designated authority deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country. However, the prime contractors, namely, constructing and procurement firms, and the prime consulting firm are limited to "Japanese nationals".

(4) Necessity of "Verification"

The Government of the recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by JICA. This "Verification" is deemed necessary to fulfill accountability to Japanese taxpayers.

(5) Major undertakings to be taken by the Government of the Recipient Country

In the implementation of the Grant Aid Project, the recipient country is required to undertake such necessary measures as Annex.

(6) "Proper Use"

The Government of the recipient country is required to maintain and use properly and effectively the facilities constructed and the equipment purchased under the Grant Aid, to assign staff necessary for this operation and maintenance and to bear all the expenses other than those covered by the Grant Aid.

(7) "Export and Re-export"

The products purchased under the Grant Aid should not be exported or re-exported from the recipient country.

(8) Banking Arrangements (B/A)

a) The Government of the recipient country or its designated authority should open an account under the name of the Government of the recipient country in a bank in Japan (hereinafter referred to as "the Bank"). JICA will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified

Contracts.

b) The payments will be made when payment requests are presented by the Bank to JICA under an Authorization to Pay (A/P) issued by the Government of the recipient country or its designated authority.

(9) Authorization to Pay (A/P)

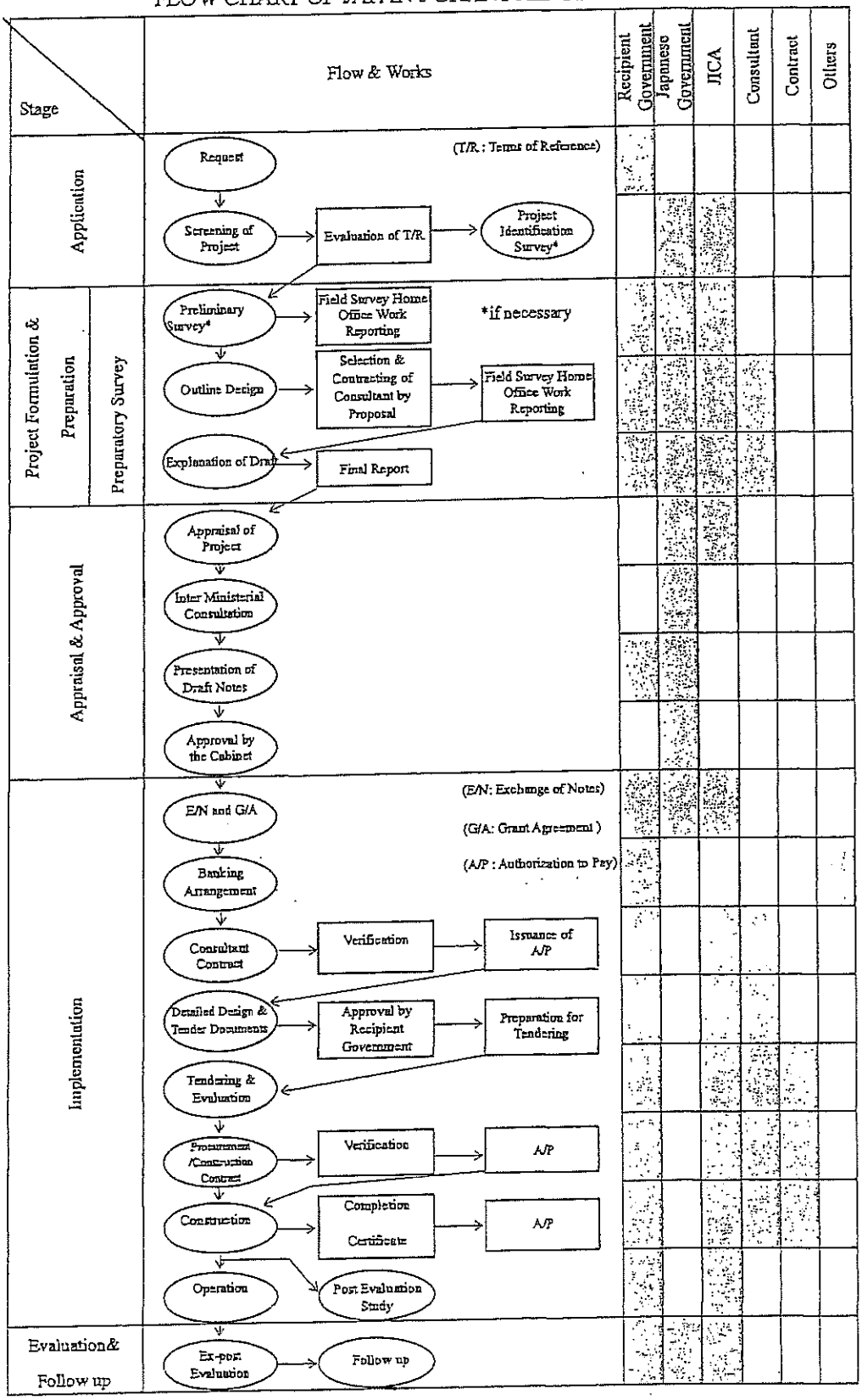
The Government of the recipient country should bear an advising commission of an Authorization to Pay and payment commissions paid to the Bank.

(10) Social and Environmental Considerations

A recipient country must carefully consider social and environmental impacts by the Project and must comply with the environmental regulations of the recipient country and JICA socio-environmental guidelines.

Annex-5

FLOW CHART OF JAPAN's GRANT AID PROCEDURES



Annex-6

Major Undertakings to be taken by Each Government

No.	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To ensure prompt unloading and customs clearance of the products at ports of disembarkation in the recipient country and to assist internal transportation of the products		
	1) Marine (Air) transportation of the Products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the Products at the port of disembarkation		●
	3) Internal transportation from the port of disembarkation to the project site	●	
2	To ensure that customs duties, internal taxes and other fiscal levies which may be imposed in the recipient country with respect to the purchase of the products and the services be exempted		●
3	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work		●
4	To ensure that the products be maintained and used properly and effectively for the implementation of the Project		●
5	To bear all the expenses, other than those covered by the Grant, necessary for the implementation of the Project		●
6	To bear the following commissions paid to the Japanese bank for banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
7	To give due environmental and social consideration in the implementation of the Project.		●
(B/A : Banking Arrangement, A/P : Authorization to pay)			

Procedure for Removal of Existing Equipment and Installation of new Equipment (Draft)

Undertakings to be taken by each Government	Order of work	Work items	1st Month			2nd Month			3rd Month			4th Month
			10	20	30	10	20	30	10	20	30	10
Pakistani Side	1	Removal of five existing studios to be renewed										
	5	Removal of existing master control system and three SCR systems										
Japanese Side	2	Installation of new five studios										
	3	Temporary installation of new master control system in the master control room										
	4	Connection of new master control outputs into external signal lines										
	6	Relocation of new master control system to designated position (for a muximum of 30 minutes)										
Broadcast down time (for a muximum of 30 minutes)												
Duration of broadcasting by using existing system												
Start of broadcasting by using new system												

MINUTES OF DISCUSSIONS
ON THE PREPARATORY SURVEY ON
THE PROJECT FOR REHABILITATION OF
MEDIUM WAVE RADIO BROADCASTING NETWORK
IN THE ISLAMIC REPUBLIC OF PAKISTAN
(Explanation on Draft Final Report)

In November 2011, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched the Preparatory Survey Team(hereinafter referred to as "the Team") on the Project for Rehabilitation of Medium Wave Radio Broadcasting Network in the Islamic Republic of Pakistan (hereinafter referred to as "the Project"), and JICA and Pakistan Broadcasting Corporation (hereinafter referred to as "PBC") had discussed and concluded various matters for the Preparatory Survey. The Minutes of Discussion (hereinafter referred to as "M/D") is attached as the Annex-4. After that, the Team has been conducting field surveys, technical examination and cost estimation for the Project, and finally, JICA has prepared the Draft Final Report (hereinafter referred to as "DF/R") as the result.

In order to explain and to consult with the concerned officials of the Government of Pakistan on the contents of the DF/R, JICA sent the Team to Pakistan. The team is headed by Mr. Toshiya Sato, Senior Representative of JICA Pakistan Office and is scheduled to stay from February 27 to March 9, 2012.

As a result of the discussions, both sides confirmed the main items described in the attached sheets.

Islamabad, March 7, 2012

Mr. Toshiya Sato
Leader
Preparatory Survey Team
Japan International Cooperation Agency

Mr. Murtaza Solangi
Director General
Pakistan Broadcasting Corporation

FOY Mr. Jamil Anwar
Joint Secretary (ADB/Japan)
Economic Affairs Division
Government of Pakistan

(SYED ZAIN GILLANI)
Deputy Secretary
Economic Affairs Division
Government of Pakistan
Islamabad

ATTACHMENT

1. Project Component
   After the explanation of the contents of the DF/R by the Team, the Pakistani side agreed in principle to the project contents, as listed in Annex-1.

2. Cost Estimation
   Both sides agreed that the Project Cost Estimation as attached in Annex-2 should never be duplicated or disclosed to any third party before the signing of all the contract(s) with contractor(s) for the Project.

3. Japan's Grant Aid Scheme
   The Pakistani side understood the Japan's Grant Aid scheme and the necessary measures to be taken by the recipient country as explained by the Team and described in Annex-4, Annex-5 and Annex-6 of the M/D signed on November 2nd, 2011(Annex-4).

4. Schedule of the Study
   JICA will complete the final report in accordance with the confirmed items and send it to the Pakistani side around May, 2012.

5. Undertakings of the Pakistan side
   The Team requested and the Pakistan side agreed on the following undertakings in addition to the major undertakings described in Annex-6 of the M/ D signed on November 2nd, 2011(Annex-4).

5-1. Security arrangement

The Pakistani side shall take all possible and necessary measures to ensure the safety of the concerned Japanese people during the implementation of the Project at the Project sites of Faqirabad Transmitting Station and Islamabad Station. As for the movement of concerned Japanese people to the Project sites, both sides confirmed that it shall be the responsibility for Japanese side.

5-2. Approval of PC-I

The Pakistani side promised to have a responsibility to undertake a necessary procedure for approval of PC-I by the Executive Committee of National Economic Council (ECNEC). The Team strongly requested Pakistani side that PC-I should be approved by the end of May, 2012. In response to that, Pakistani side agreed to make the best efforts to manage it.

5-3. Tax exemption

The Pakistani side confirmed to make necessary arrangement for tax exemption and custom clearance for project related equipments, materials and facilities.

5-4. Banking Arrangement (B/A) and Authorization to Pay (A/P)

The Pakistani side confirmed to bear the following costs as a condition for the Japan's Grant Aid to be implemented.

(1) The commissions for the banking services based upon Banking Arrangement (B/A)
(2) The advising commission for the Authorization to Pay (A/P)

5-5. Necessary works and arrangements

The Pakistani side confirmed to undertake necessary procedure to carry out the works as listed in "Scope of Works" at Annex-3.

As for physical works, such as removal of existing facilities and repair of transmitting station building etc, detail schedule for these works will be decided in the Detailed Design Survey. However, the Pakistani side confirmed to accomplish the works before commencement of installation of new equipment(Tentatively, it is 16 months after the commencement of the Project).

6. Other Relevant Issues

6-1. Alternative broadcast equipment during installation of new equipment

Since there will be no broadcast equipment during the period of removal of existing equipment and installation of new equipment, the Pakistani side explained to take the following measures to ensure continuity in broadcasting.

(a) During the period of suspension of broadcasting from Faqirabad Transmitting Station, the Pakistani side agreed to put on air Islamabad service through FM transmitter, as a fill-gap arrangement. Through FM service, the listeners will also be informed about commissioning of a new medium wave transmitter at Faqirabad.

(b) During installation of new master control system, the Pakistani side shall operate both new and existing system at same time. Outline of procedure as explained and described by the Team in "Procedure for Removal of Existing Studios" is given at Annex-5.

6-2. Repairing of the medium wave antenna in Faqirabad Transmitting Station

The Team strongly recommended to repair and repaint medium wave antenna in Faqirabad Transmitting Station in near future, taking into consideration the Project sustainability. The Pakistani side understood the situation and confirmed to take the best effort for securing necessary budget for repairing of the medium wave antenna.

Annex-1 Project Component
Annex-2 Project Cost Estimation (Confidential)
Annex-3 Scope of Works
Annex-4 Minute of Discussion signed on 2nd of November, 2011
Annex-5 Procedure for Removal of Existing Equipment and Installation of new Equipment(Draft)

Annex-1

Project Component

Item	Description	Q'ty
I.	Faqirabad Transmitting Station	
1.	500kW MW Transmitter (250 kW+250 kW Combining)	1 Set
2.	Auxiliary Equipment (Dummy Load, PIE, Control Panel , 11 kV Transformer, Air Conditioner, etc)	1 Set
3.	Spare Parts	1 Set
4.	Measuring Equipment for maintenance	1 Set
5.	ISDN Codec (1 Link : Islamabad – Faqirabad, Main and Standby)	1 Set
6.	Installation Work & Installation Materials	1 Set
II.	PBC Headquarter	
1.	On Air Studio System	2 Sets
2.	Production Studio System	2 Sets
3.	Editing System	1 Set
4.	Master Control System	1 Set
5.	Installation Work & Installation Materials	1 Set

This page is closed due to the confidentiality.

3. **Condition for estimation**

1) Estimation point: May ~ October 2011

2) Exchange rate: 1 US$ = 79.67 yen

1 PKR = 0.909 yen

4. **Others**

1) The above estimation was implemented in accordance with relevant rules and the guideline of the Japanese Grant Aid.

2) The breakdown of the estimated project cost (Recurrent Cost) to be borne by Pakistani side is as follows.

Project Cost (Recurrent Cost) Item	Estimated Amount (1,000 PKR)
(1) Electricity tariff in line with increased output (per year)	30,000
(2) Personnel costs (per year)for new staff	24,000
(3) Repair / Repainting of Faqirabad transmitting station medium wave antenna (one time cost)	15,000
(4) ISDN Codec Line (per year)	600
Total	69,600

Scope of Works

Item	Scope		Remarks
	Japanese Side	Pakistani Side	
1. Common items			
(1) Equipment procurement	○		Including forced cooling system for transmitter
(2) Transport to the Project site	○		
(3) Securing Cargo storage space or area for new equipment and materials in the Project site		○	
(4) Equipment installation works	○		
(5) Implementation of testing and training on the Project site	○		Conducting OJT training on the transmitter, equipment of the master control, system configuration, troubleshooting and maintenance for approximately one week respectively.
(6) Implementation of test broadcasts	(Advice)	○	Confirmation of broadcast operation through actual broadcasting for one day. Checking / Measurement of equipment and collection of necessary data.
2. Faqirabad Transmitting Station			
(1) Removal of existing equipment - Removal of existing transmitters and transmitting equipment - Removal of the outdoor transformer and other unnecessary facilities - Removal of other equipment not required in the Project Existing equipment outside the transmitter room targeted for renewal in the Project shall be removed.		○	This shall be finished before the start of works by the Japanese side
(2) Partial upgrading and repair of transmitting station building - Outside walls: Recoating of worn paint is needed - Ceiling: Repair is recommended - Roof: New application of a waterproof layer - Feeder: Reinforcing and repair of degraded parts of the feeder frame		○	Only the waterproofing works need to be finished before the start of works by the Japanese side. Feeder frame works will be carried out at the same time as the main works while broadcasts are suspended. Other items, such as recoating outside walls, will be implemented after the main works.
(3) Partial upgrading and repair of transmitting station building - Floor: Removal of existing tiles and raising of tiles - Floor cable pit cover - Walls: Prepare openings for new ventilation ducts - Partitions: Install panels for the new transmitter partition wall (panel: transformer incidental facilities and coating)	○		Floors will be finished using antistatic vinyl tiles.

Item	Scope		Remarks
	Japanese Side	Pakistani Side	
- Chamber for intake air to the transmitter (blocks and mortar finish with coating) - Doors: Made from iron (outside doors shall be the dustproof type)			
(4) Electrical works - Connection with transformer for new transmitter (11KV to 400V) - Cable connection from city power supply or emergency generator to the new transformer - Appropriate maintenance of the emergency generator - Indoor lighting: Renewal (only in the rooms targeted for upgrading) - Preparing line and terminal for new ISDN codec in the control room.		○	This shall be finished before the start of works by the Japanese side. (However, the new distribution panel will be supplied by the Japanese side and will be the connection point between the Pakistani side works and Japanese side works).
3. PBC Islamabad Headquarters			
(1) Removal of existing equipment - Removal of equipment from news studios 1~4 - Removal of master control and talk studio equipment - Removal of other unnecessary instruments and cables, etc. - Preparing line and terminal for ISDN codec in the master control room.		○	This shall be finished before the start of works by the Japanese side.
(2) Upgrading and repair of the station building deemed necessary by the PBC		○	Ditto
(3) Necessary electrical works and supply of electricity to equipment		○	Ditto

Note: ○: Indicates the scope of responsibility regarding each item

5. List of Collected Documents

List of Collected Document

Survey Title: The Preparatory Survey on the Project for Rehabilitation of Medium Wave Radio Broadcasting Network in the Islamic Republic of Pakistan

No	Title	Type (Printed Document, Video, Map, Photo, etc.)	Original/ Copy	Published by	Year of Publication
1.	MW Broadcasting Station in Rawalpindi Equipment Location in the Transmitter Building, Specification	Printed Document	Copy	Ministry of Communications State Projecting Institute	1968
2.	Project for 1000kw MW Broadcasting Station in Rawalpindi, Volum2 General Plan and Antenna and Feeder Structures	Printed Document	Copy	Ministry of Communication of the USSR State Projecting Institute, Moscow	1968
3.	Metrological Data of Attock Pakistan	Printed Document	Copy	Government of Pakistan Pakistan Meteorological department (National Agromet Centre)	2011
4.	AM coverage area in Pakistan	Printed Document	Copy	PBC	2011
5.	List of Commercial FM Radio	Printed Document	Copy	PAMERA	2011
6.	Medium For The Millions	Book	Original	PBC	2011
7.	List of Radio Pakistan's Station/ Units of AM/FM and Short wave	A4 Binding	Copy	PBC	2011
8.	Detail of Transmitters and Equipment	Book	Copy	PBC Faqirabad	2011
9.	Revised Sanctioned Strength After Rightsizing	A4 Binding	Copy	PBC	2011
10.	Pakistan Economic Survey 2010/2011	Book	Original		2011
11.	Pakistan Statistical Year Book 2011	Book	Original		2011

6. Survey of Social Condition

Survey on Social Condition

Sample Characteristics: Sex and Age of Respondents

Sample Characteristics:

The phone survey was conducted in the following four rural and urban districts:

a) Ghizer
b) Rawalpindi
c) Peshawar
d) Multan

Respondents from the district Ghizer belonged mainly to Gupis, which is one of the four administrative units or tehsils of the district. A few respondents were from the other tehsils of Ishkoman, Punial, and Yasin. The participants from the tehsil of Punial were residents of the town of Gakuch, which is also the district's headquarter and famous to attract tourists in the area (visitgilgitbaltistan.gov.pk). Different ethnic groups inhabit Ghizer, and there are several languages that are spoken such as, Khowar, Shina, Burushaski, Wakhi, Pushto, Gujar, and Urdu (wordpress.com).

The survey participants from the district of Rawalpindi belonged to tehsil of Murree, and included areas of Osia, Dewal, Bansa Gali, Kashmiri Bazar, Company Bagh, Berot, Nathiya Gali, Pindi Point, Ghiga Gali, Toppa, and Mall. Murree is a very beautiful hill station that is located about 50 km North of Islamabad (tourism.gov.pk). Dhundi Kairali commonly known as Pahari language is spoken in Murree Hills and Northeastern part of Rawalpindi district (Lothers, 8).

Peshawar is not only one of the main districts of Khyber Pukhtunkhwa, but also the capital and the largest city in the province. The historical Mughal Mosque and the Bala Hisar Fort are popular tourist attractions in the city (khyberpakhtunkhwa.gov.pk). Main languages of the area include Hindko and Peshawari. Hindko is a name that describes wide variety of languages and dialects such as Siraiki dialiects, Peshawari Hindko, Hindko of Attock, and Hindko of Hazara (Lothers, 8).

There are 6 towns in the district of Multan including Shah Rukan Alam, Shershah Bosan, Musa Pak, Shujabad and Jalalpur Pirwala. The district of Multan is famous for shrines of Shah Rukan-e-Alam, Saint Bahauddin Zakarya, and Shah Sabzwari (multan.gov.pk). Main languages spoken in Multan are Saraiki spoken by 54% residents, Haryanvi spoken by 11% residents, Urdu spoken by 6.5% residents, and Punjabi spoken by 5% residents (usatoday.com).

Respondnets in the district of Multan came from towns of Jalal Pur Pirwala, Bosan, and Sher Shah whereas participants of Peshwar were not specifically from any particular area, but originated from different areas of Peshawar.

1. Sex of Respondents:

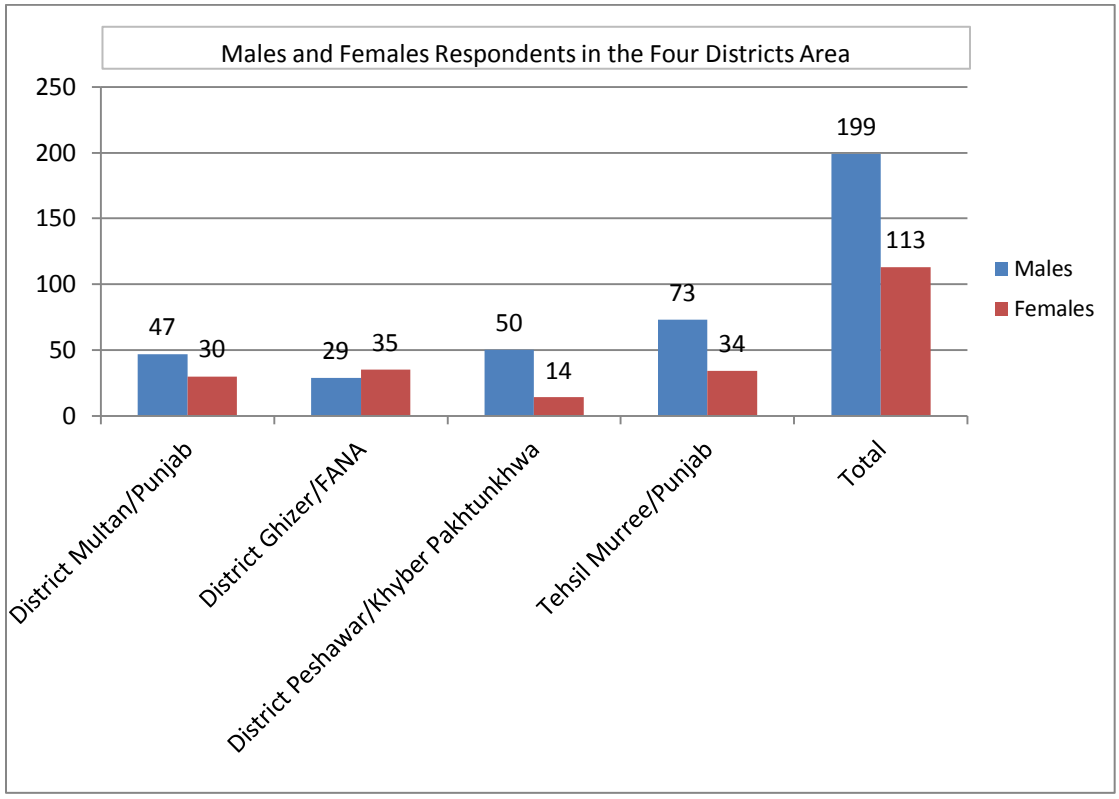
While conducting the survey, the rule that the sex ratio should be 50% ± 10% was considered. Out of total 312 survey participants from the four districts of Ghizer, Multan, Rawalpindi, and Peshawar, 113 participants were females and 199 participants were males. The total number of male and female respondents in each district is represented by the table 1.1.

Table 1.1 Sex of Respondents in the Four Districts

	Tehsil or District/State	Males	Females
1	District Multan/Punjab	47	30
2	District Ghizer/FANA	29	35
3	District Peshawar/Khyber Pakhtunkhwa	50	14
5	Tehsil Murree/Punjab	73	34
	Total	**199**	**113**

The following figure 1.1 shows that the highest number of male respondents came from the tehsil of Murree in the Rawalpindi district, and the lowest number of male participants was recorded in the district of Ghizer in Federally Administered Northern Areas (FANA) whereas the highest number of female participants was observed in the district of Ghizer, and the lowest number of female participants was obtained in the district of Peshawar.

Fig. 1.1 Gender Distribution of the Survey Respondents

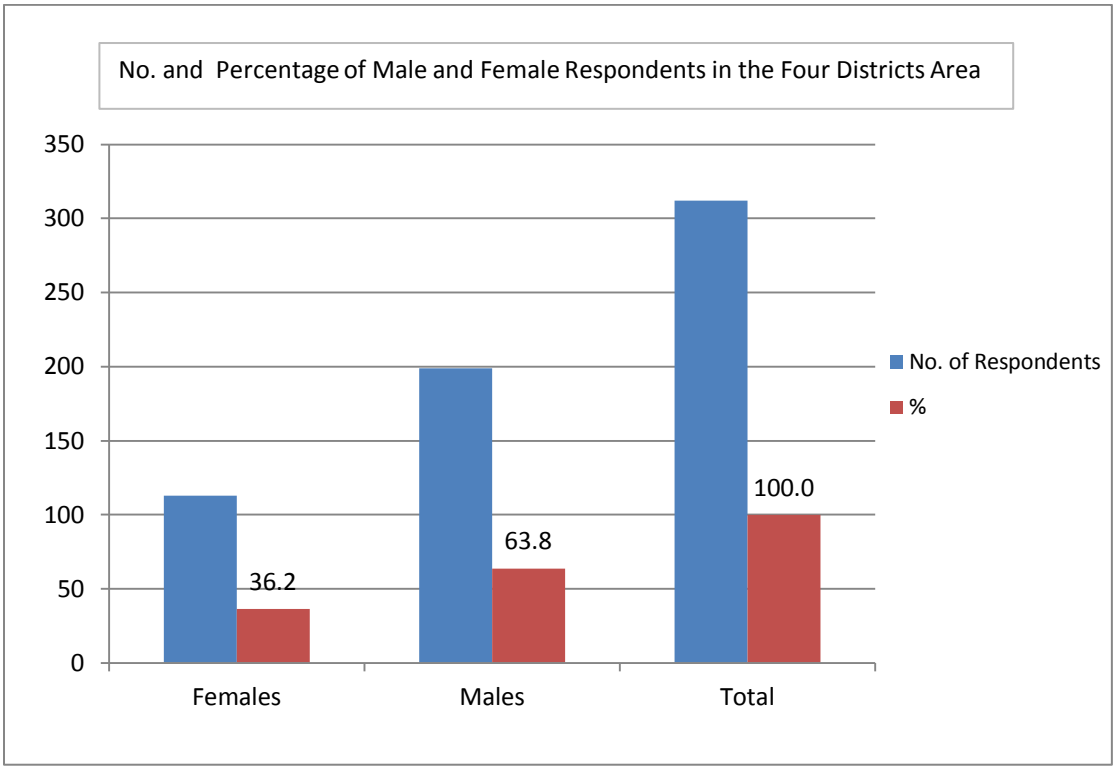


Among the total 312 respondents from all four districts, the male to female ratio was 63.8% to 36.2% that can be shown by the following table 1.2, and the figure 1.2.

Table 1.2 No. and Percentage of Respondnets in the four Districts

	Sex	No. of Respondents	%
1	Females	113	36.2
2	Males	199	63.8
	Total	**312**	**100.0**

Fig 1.2 Number and Percentage of Respondents by Gender

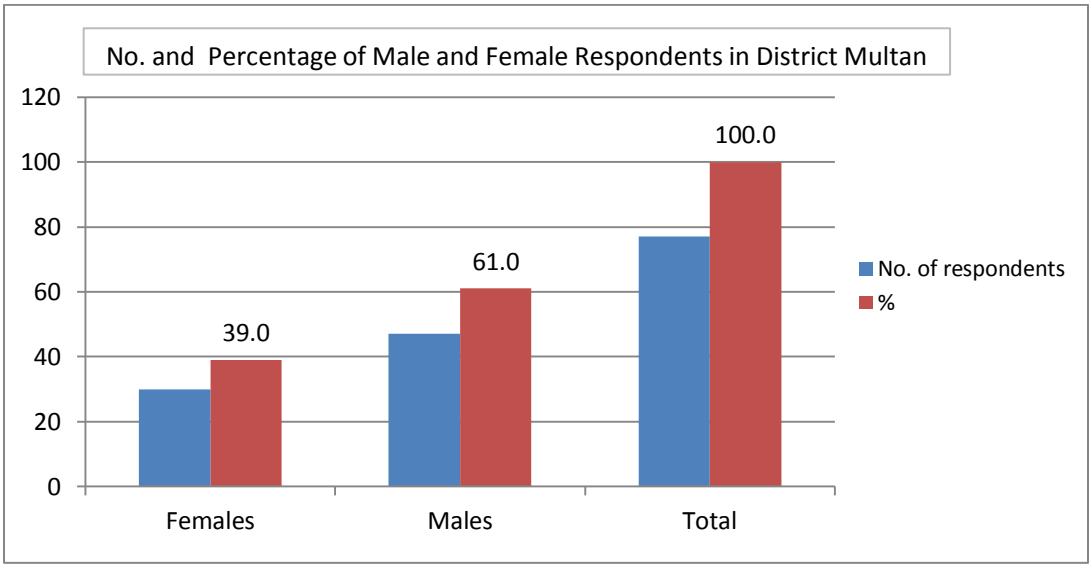


The number of survey participants in the district of Multan was 77, where 61.0 percent of respondents were males, and 39.0 percent of respondents were females as shown by the table and graph below:

Table 1.3 *No. and Percentage of Male & Female Respondents in Multan*

	Sex	No.	%
1	Females	30	39.0
2	Males	47	61.0
	Total	**77**	**100.0**

Fig 1.3 No. and Percentage of Respondents in Multan

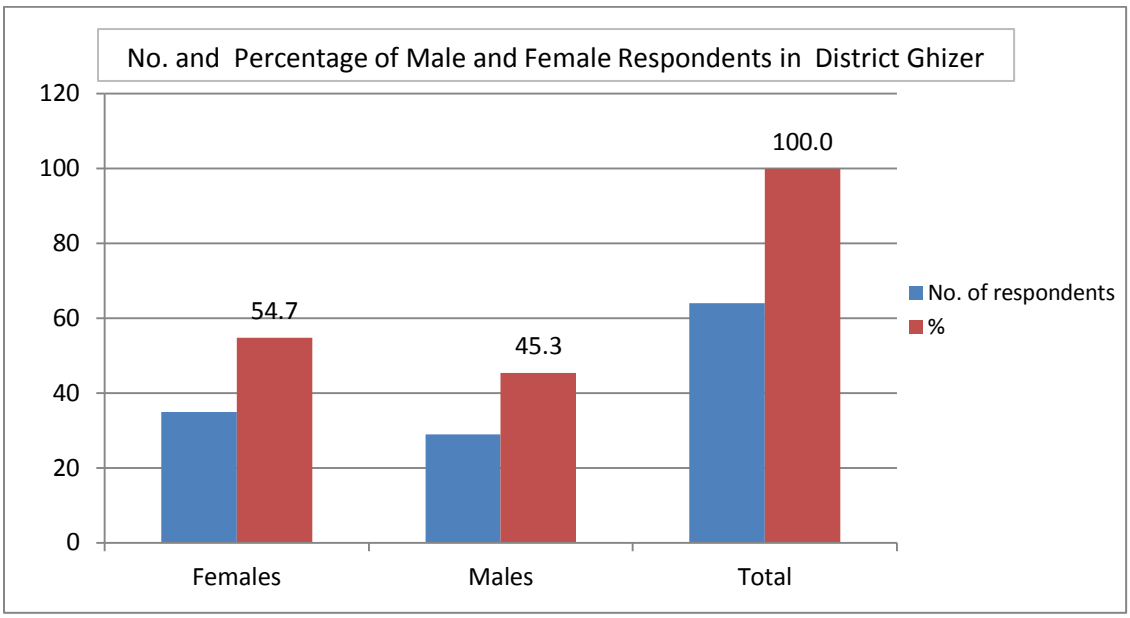


There were total of 64 survey participants in the district of Ghizer, and 54.7% of survey participants were females and 45.3% percent of participants were females as exhibited in the table 1.4 and figure 1.4.

Table 1.4 No. and Percentage of Male & Female Respondents in Ghizer

	Sex	No.	%
1	Females	35	54.7
2	Males	29	45.3
	Total	**64**	**100.0**

Fig 1.4 No. and Percentage of Respondents in Ghizer

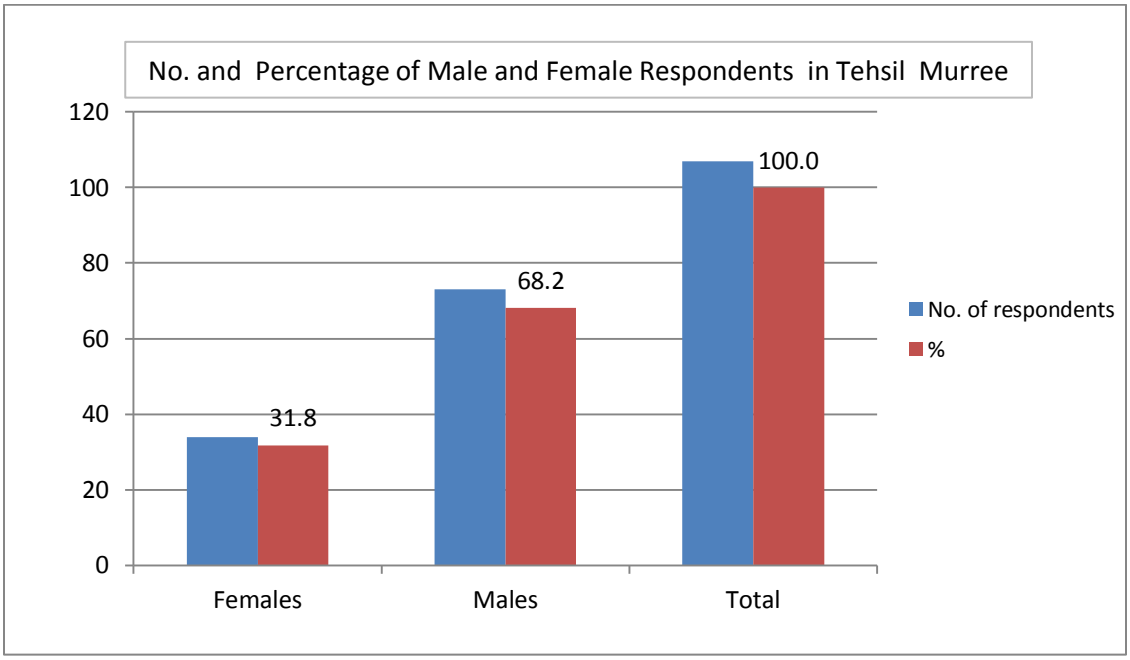


Higher percentage of male respondents was obtained in the district of Murree as compared to female repsondents. There were 107 survey participants with 68.2% male respondents and 31.8% female respondents.

Table 1.5 No. and Percentage of Male & Female Respondents in Murree

	Sex	No.	%
1	Females	34	31.8
2	Males	73	68.2
	Total	**107**	**100.0**

Fig. 1.5 No. and Percentage of Male and Female Respondents

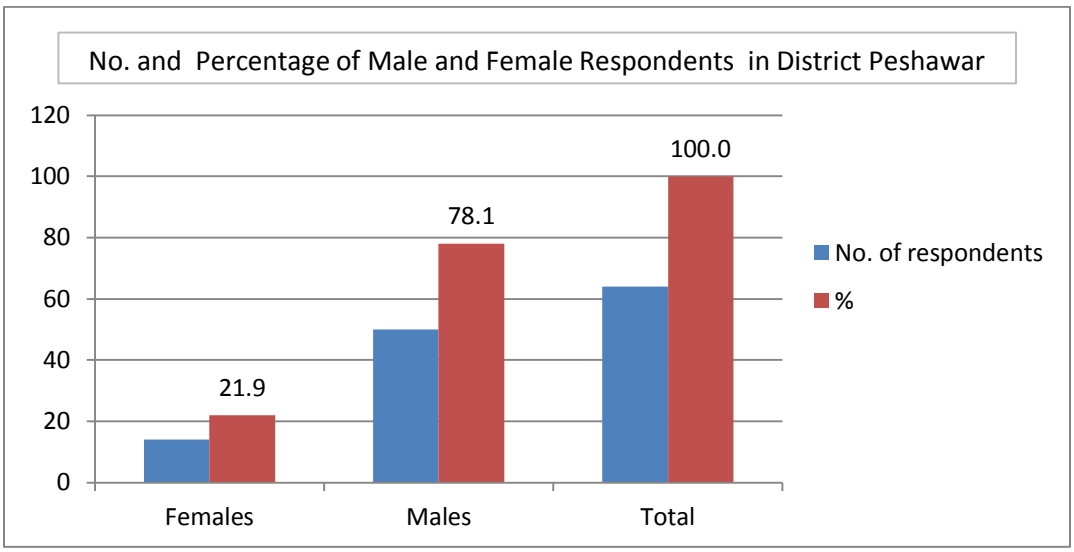


Total number of phone survey conducted in the district of Peshwar was 64. There was considerable difference between percentage of male and female respondents in the district with 78.1% male respondents and 21.9% female respondents. The difference can be observed in the following table 1.7 and figure 1.7.

Table 1.6 No. and Percentage of Male & Female Respondents in Peshawar

	Sex	No.	%
1	Females	14	21.9
2	Males	50	78.1
	Total	**64**	**100.0**

Fig. 1.6 No. and Percentage of Respondents in Peshawar



2. Age of Respondents:

The phone survey focused on the age groups of 18 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, and 60 years or above.While conducting the phone survey, the following survey requirement was kept in mind:

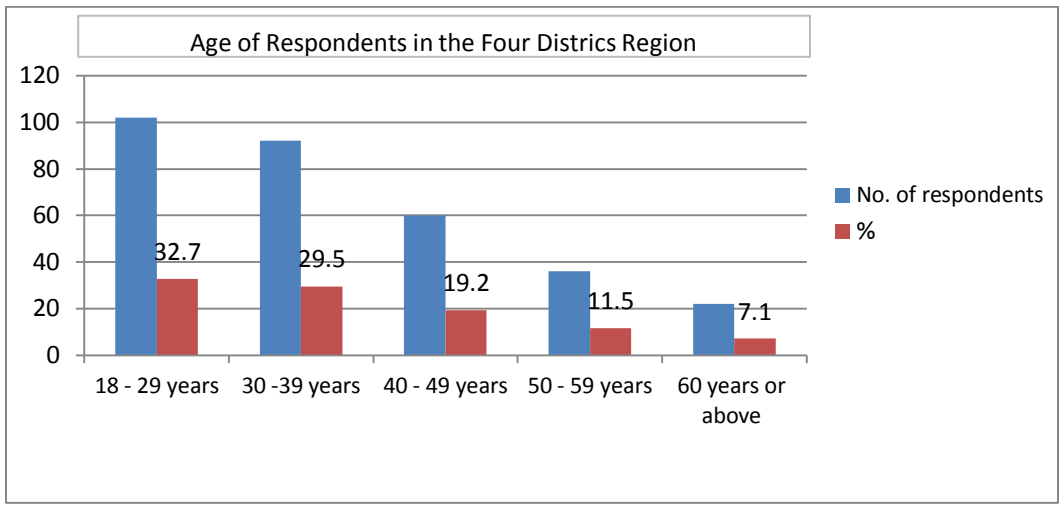
- Age groups of 18-29 years, 30-39 years, 40-49 years, 50-59 years, and above 60 years should have a ratio of 20% each.

Out of total 312 repsondents from the districts of Peshawar, Ghizer, Multan, and the tehsil of Murree, the highest number of respondents came from the age group of 18 to 29 years, and the least number of respondents were from the age group of 60 years or above. The ratios of respondents obtained are shown in the following table 2.1 and figure 2.1. The 20% respondent ratio requirement could not be satisfied for the age groups of 50 to 59 years and 60 years or above. 18.3% of respondents belonged to the age group of 40 to 49 years, which is not exactly 20% ratio, but close to it.

Table 2.1 *Age of Respondents in the Four Districts Region*

	Age groups	No. of Respondents	%
1	18 – 29 years	102	32.7
2	30 -39 years	92	29.5
3	40 – 49 years	60	19.2
4	50 - 59 years	36	11.5
5	60 years or above	22	7.1
	Total	**312**	**100.0**

Fig. 2.1 Age of Respondents in the Four Districts

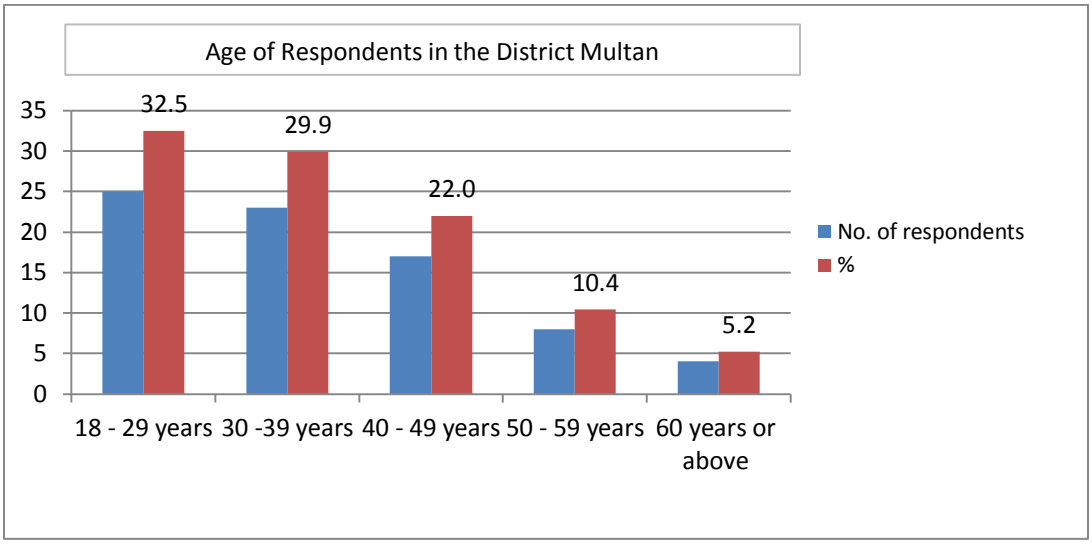


Majority of survey participants in the district of Multan fell in the age groups of 18 to 29 years, 30 to 39 years, and 40 to 49 years. 20% respondent ratio requirement could not be met for the age groups of 50 to 59 years and 60 years or above. The ratios of different age groups are shown in the following table 2.2 and figure 2.2.

Table 2.2 Age of Respondents in the District Multan

	Age groups	No. of Respondents	%
1	18 - 29 years	25	32.5
2	30 -39 years	23	29.9
3	40 - 49 years	17	22.0
4	50 - 59 years	8	10.4
5	60 years or above	4	5.2
	Total	**77**	**100.0**

Fig 2.2 Age of Respondents in Multan

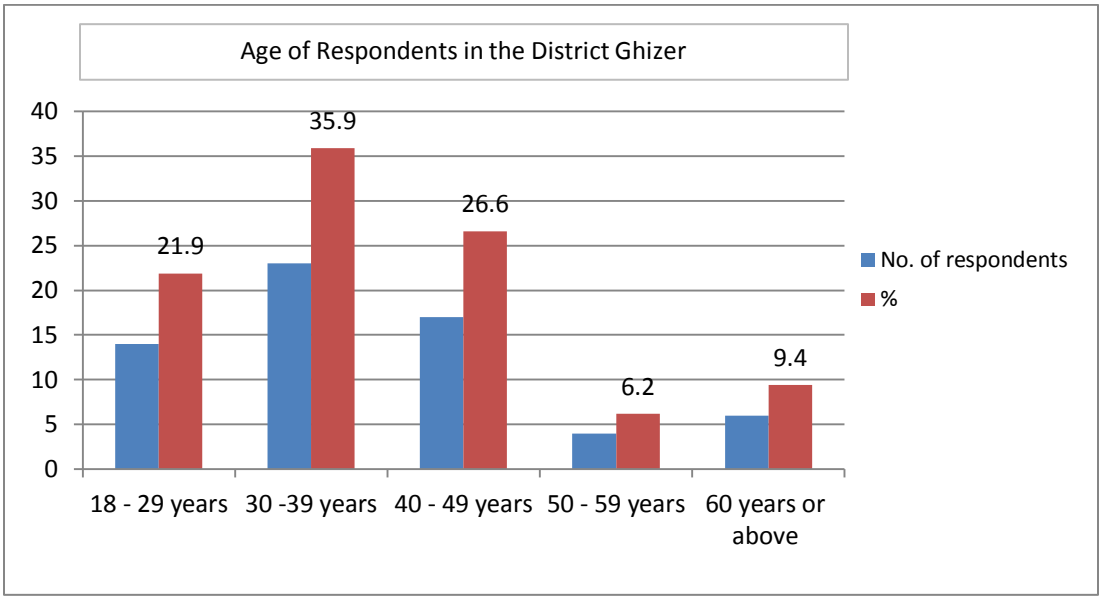


The age ratio obtained in the district of Ghizer for the age groups of 18 to 29 years, 30 to 39 years, 40 to 49 years was above 20%, but the age ratios obtained for the age groups of 50 to 59 years and 60 years and above were 6.2% and 9.4% respectively, which was comparatively lower than the other age groups. The range of ratios recorded can be observed in the following table 2.3 and figure 2.3.

Table 2.3 Age of Respondents in the District Ghizer

	Age groups	No. of Respondents	%
1	18 - 29 years	14	21.9
2	30 -39 years	23	35.9
3	40 - 49 years	17	26.6
4	50 - 59 years	4	6.2
5	60 years or above	6	9.4
	Total	**64**	**100.0**

Fig 2.3 Age of Respondents in Ghizer

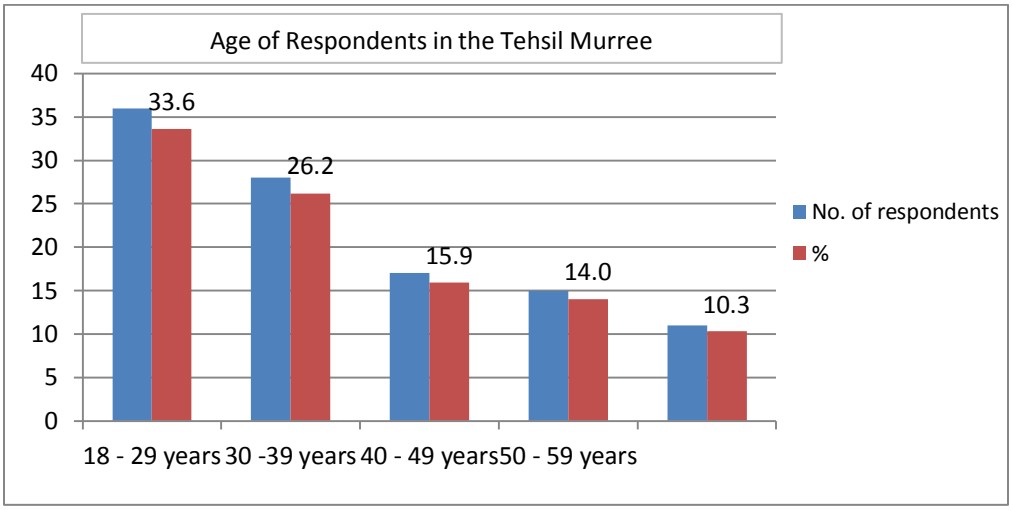


The sample size of the tehsil Murree was comparatively larger than the other areas surveyed. Age groups of 18 to 29 years and 30 to 39 years satisfied the 20% ratio requirement in the tehsil, but the remaining age groups gave the respondent ratios less than 20% as shown in the table 2.4 and the figure 2.4.

Table 2.4 ***Age of Respondents in the Tehsil Murree***

	Age groups	No. of Respondents	%
1	18 - 29 years	36	33.6
2	30 -39 years	28	26.2
3	40 - 49 years	17	15.9
4	50 - 59 years	15	14.0
5	60 years or above	11	10.3
	Total	**107**	**100.0**

Fig. 2.4 Age of Respondents in Murree

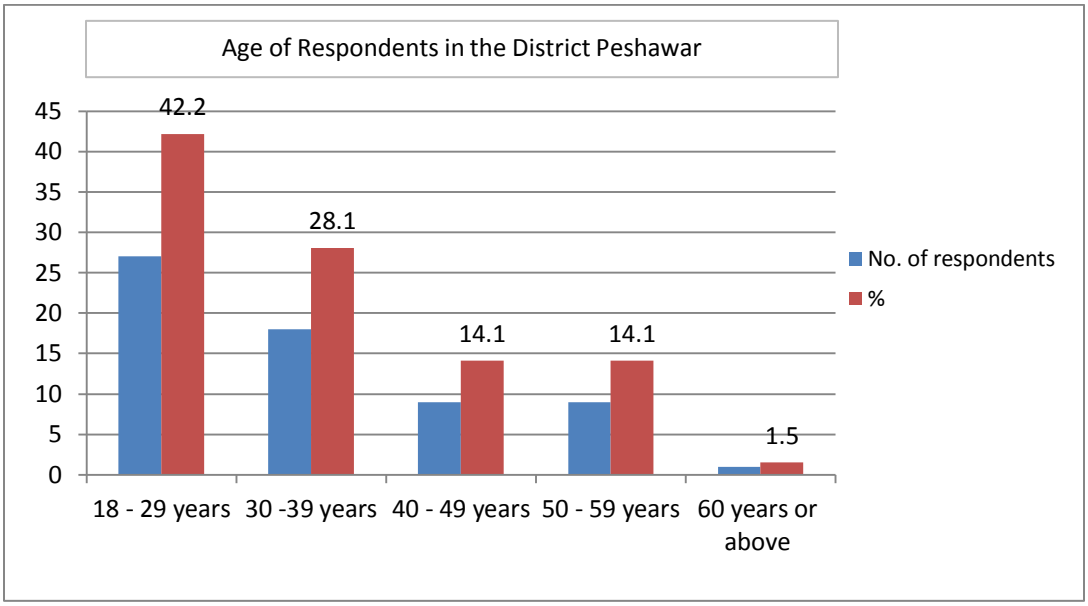


There were total of 64 survey participants in the district of Peshawar. The highest number of participants was from the age group of 18 to 29 years, and lowest number of participants was recorded for the age group of 60 years or above. There was only 1 respondent who was either 60 years or above 60 years in age, which represented the respondent ratio of only 1.5%, which is quite lower than the highest respondent ratio of 42.2% of age group of 18 to 29 years. The following table 2.6 and the figure 2.6 show the variation in the respondent ratios of different age groups.

Table 2.5 *Age of Respondents in the District Peshawar*

	Age groups	No. of Respondents	%
1	18 - 29 years	27	42.2
2	30 -39 years	18	28.1
3	40 - 49 years	9	14.1
4	50 - 59 years	9	14.1
5	60 years or above	1	1.5
	Total	**64**	**100.0**

Fig. 2.5 Age of Respondents in Peshawar



Conclusion:

The requirement that the sex ratio should be 50% ± 10% could not be satisfied for every region under investigation. Furthermore, the requirement that age groups of 18 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, and 60 years and above should have a ratio of 20% each could not be fully satisfied, but partial satisfaction for some age groups was recorded in the districts and tehsils under study.

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2. Methodology:

2.1 Objectives of the survey

The study was concerned with the identification of geographical areas that have been facing problems in the reception of radio signals especially the medium wave transmission. The study also focused on determining the radio listening pattern, evaluation and satisfaction level of current radio broadcasting, and preferences related to radio programs on different radio bands.

2.2 Survey Methodology

Interview over the phone method was used to conduct the survey in the districts of Peshawar, Ghizer, and Multan, and the teshil of Murree. The survey questionnaire had 27 questions including questions related to gender, age, native language, occupation, number of household members, etc. High emphasis was put on gathering information related to listening patterns, choices related to media access, means of obtaining information, devices used to listen to radio broadcasting, radio listening habits, radio bands, radio programs, and languages. Moreover, information regarding the quality of reception of FM, MW, and AM signals, and satisfaction level of current radio programming was also compiled.

2.3 Selection of Target Areas

Pakistan is situated in the northwest area of South Asia (nationalgeographic.com). The northern part of the country is dry and rich in mountain ranges (khyberpakhtunkhwa.gov.pk). There are four provinces of Pakistan including Khyber Pukhtunkhwa, Punjab, Sindh and Balochistan (infopak.gov.pk). Besides the four provinces, there are two centrally administered areas, one capital territory, and one territory. Azad Kashmir and Gilgit Baltistan are two centrally administered areas, Federally Administered Tribal Areas (FATA) is a teritory, and Islamabad is the capital territory (statoids.com).

Khyber Pakhtunkhwa is diverse in culture, languages, and ethnicity. There are three main administrative units in Khyber Pakhtunkwah. Districts of Bannu, Battagram, Charsadda, Dera Ismail Khan, Hangu, Abottabad, Haripur, Kohistan, Kohat, Karak Lakki Marwat, Mansehra, Mardan, Nowshera, Swabi, Peshawar, and Tank make up the first administrative unit. The next administrative unit is Provinicially Administered Tribal Areas (PATA) that includes districts of Upper Dir, Lower Dir, Chitral, Swat, Buner, Shangila, Kala Dhaka, Kohistan, and Malakand Agency (kyberpukhtunkwha.gov.pk). The third administrative unit is Federally Administered Tribal Areas (FATA), which is composed of six Frontier Regions consisting of Bannu, Central Kurram, Dera Ismail Khan, Kohat, Lakki, Peshawar, and Tank, and seven Tribal Agencies including Bajaur, Mohmand, Khyber, Orakzai, Kurram, North Waziristan and South Waziristan (khyberpuktunkhwa.gov.pk). Besides PATA and FATA there is another group of areas consisting of Gilgit Baltistan that are federally controlled by Northern Areas Council Legal Framework Order of 1994 (LFO), and is therefore called Federally Administered Northern Areas (FANA) (globalsecurity.org).

Punjab consists of several districts including Attock, Bhalwalnager, Bhawalpur, Bhakkar, Chakwal, Chaniot, Dera Ghazi Khan, Faisalabad, Gujranwala, Gujrat, Hafizabad, Jhang, Jhelum,

Kasur, Khanewal, Khusab, Lahore, Layyah, Lodhran, Mandi Bahauddin, Mianwali, Multan, Muzaffargarh, Nanakana, Narowal, Okara, Pakpattan, Rahim Yar Khan, Rajan Pur, Rawalpindi, Sahiwal, Sargodha, Shiekupura, Sialkot, Toba Tek Singh and Vehari. Geographically, the most of the Punjab is located at a plain level, but there are some mountains and hills in northwest and southwest area of the province (punjab.gov.pk).

Survey was conducted in both rural and urban areas in the chosen provinces. Among the target locations, urban areas included the districts of Multan and Peshawar, whereas tehsils of Murree and Gupis represented the rural areas of districts of Rawalpindi and Ghizer respectively.

The district of Multan and the tehsil of Murree belong to the province of Punjab, and the district of Peshawar is located in the province of Khyber Pukhtunkhwa, and tehsil of Gupis belongs to Ghizer that is a district of Gilgit Baltistan previously known as Northern Areas (gilgitbaltistan.gov.pk).

The reception quality of Radio Pakistan varies in different regions of chosen provinces. Moreover, Pakistan is a country with diverse culture, ethnicity, and languages. With this in mind, the above-mentioned locations were chosen to conduct the survey.

2.4 Sample Size and Respondent Selection

It was decided that at least 60 respondents would be chosen from each target location thus the total number of respondents would be no less than 300. Moreover, the following requirement should also be kept in mind:

1. The male to female ratio should be 50% $\pm$ 10%.
2. The five age groups of 18 to 29 years, 30 to 39 years, 40 to 49 years, 50 to 59 years, and 60 years or above should have a ratio of 20% in each group.

Respondents were chosen randomly at the following telephone directory website:

- www.phonebook.com.pk

Moreover, personal references were also used to compile list of telephone numbers of potential survey participants in areas under investigation.

2.5 Data Analysis

The data was collected by employing a survey questionnaire. The MS Excel software was used to organize and analyze data gathered by the survey questionnaire forms. Tables and graphs were generated to show the survey result in overall region and each location.

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