

NO.

**Ministry of Health
Republic of Montenegro**

**BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR IMPROVEMENT OF MEDICAL
EQUIPMENT FOR MAIN HOSPITALS
IN
REPUBLIC OF MONTENEGRO**

September 2006

JAPAN INTERNATIONAL COOPERATION AGENCY

ICONS INTERNATIONAL COOPERATION Inc.

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PREFACE

In response to a request from the Government of Serbia and Montenegro, the Government of Japan decided to conduct a basic design study on the Project for Improvement of Medical Equipment for Main Hospitals in Republic of Montenegro and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Republic of Montenegro a study team from March 17 to April 11, 2006.

The team held discussions with the officials concerned of the Government of Serbia and Montenegro, and conducted a field study at the study area. After the team returned to Japan, further studies were made. Then, a mission was sent to Republic of Montenegro in order to discuss a draft basic design, and as this result, 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.

I wish to express my sincere appreciation to the officials concerned of the Government of Republic of Montenegro for their close cooperation extended to the teams.

September, 2006

Masafumi KUROKI
Vice-President
Japan International Cooperation
Agency

September, 2006

Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Medical Equipment for Main Hospitals in Republic of Montenegro.

This study was conducted by ICONS International Cooperation Inc., under a contract to JICA, during the period from March, 2006 to September, 2006. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Montenegro and formulated the most appropriate basic design for the project under Japan's Grant Aid scheme.

Finally, we hope that this report will contribute to further promotion of the project.

Very truly yours,

Keiji IIMURA
Project manager,
Basic design study team on the Project for
Improvement of Medical Equipment for Main
Hospitals in Republic of Montenegro.
ICONS International Cooperation Inc.



Map of the Target Hospitals

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Abbreviations

AIDS	Acquired Immunodeficiency Syndrome
CEE	Central and Eastern Europe
CT	Computed Tomography
DPRS	Development Poverty Reduction Strategy
ECG	Electro Cardio Graph
E/N	Exchange of Notes
EU	European Union
EURO	Currency of European Union
HIV	Human Immunodeficiency Virus
HIF	Health Insurance Fund
ICU	Intensive Care Unit
IDP	Internally Displaced Persons
JICA	Japan International Cooperation Agency
M/D	Minutes of Discussion
ME	Medical Electronics
NIBP	Non-invasive Measurement of Blood Pressure
ODA	Official Development Assistance
PRSP	Poverty Reduction Strategy Paper
TB	Tuberculosis
UN	United Nations
USD	Currency of U.S.
YEN	Currency of Japan

Summary

Summary

The western region of the Republic of Montenegro (Montenegro) faces the Adriatic Sea, its eastern part shares a border with Serbia, its south-western part with Albania, while its northern border is surrounded by the countries forming the former Federation of Yugoslavia, namely Croatia and Bosnia-Herzegovina. Montenegro has a geographical area of 13,812 square kilometers and a population of about 620,000 (2005 figures).

In its history and politics Montenegro has been closely tied to the Republic of Serbia (Serbia) but in October 2000, when Milosevic's Serbian regime collapsed, although there was a growing movement towards separation from the Federal Republic of Yugoslavia, public opinion remained divided between seeking independence and continuing with the alliance and support from Serbia. In 2003, when increasing autonomy was granted, its name was changed from the Federal Republic of Yugoslavia to Serbia and Montenegro. However, some three years after the formation of Serbia and Montenegro, Montenegro was assured of its right to separate and become an independent sovereign state and, following a popular referendum in May 2006 on the issue of independence for the state, a proposal to opt for independence was approved and in June 2006 the country's assembly announced the independence of Montenegro.

Since 1950, Montenegro had witnessed changes in public health, with reduced mortality rates from infectious disease and parasitic infestations, increased mean life expectancy, and a reduction in child mortality rates. In 2003 the total number of deaths in Montenegro stood at 5,704, with a prevalence of illnesses broadly similar to that in developed countries. Circulatory diseases accounted for over 50% of deaths, and in second place came cancers (16.9%). Also, as the number of Internally Displaced Persons (IDP) and refugees increased, the improvement of medical health services given to this stratum of impoverished citizens has become a major issue.

In 2005 the Montenegro Ministry of Health in its master plan for national health policy "Development of the Health Care System in Montenegro for the period 2005-2010" listed the following as its main aims: i) to plan and organize the development of capacity in order to provide equal access to health care, ii) to define the priority areas for development, iii) to bring the health care system into a state of optimal operation in line with socio-economic development, iv) to increase the efficiency and quality of health care through changes in organization and functioning, and v) to improve management of the health care system. In order

to fulfill these policies there is a concrete plan of action aimed at strengthening the referral system and improving the functioning of hospitals.

However, with the dissolution of former Yugoslavia, and the imposition of international sanctions, the resulting economic depression has hindered any improvements to the health of the country's citizens. With the deterioration in the economy and finances of the former state of Serbia and Montenegro, the budget for medical health services has been curtailed. This has meant that since the 1990's the facilities and equipment in each tier of medical establishments has in large part not been renewed, and so both the quality and volume of medical health services have markedly decreased.

Of the 37,656 patients attending the Clinical Centre of Montenegro in Podgorica, (hereafter: the Clinical Centre) in 2005, some 7,115 patients (18.9%) were sent abroad (mainly to Serbia) in order to obtain better medical care. After Montenegro's independence, this state of affairs has put an increasing burden both on patients and medical finances, and improvements are being sought in the establishment of the country's own medical system (including the tertiary sector) and services.

In each of the country's seven secondary hospitals both they and their equipment are generally decrepit, and this has hindered proposals to provide an appropriate level of secondary medical services to their citizens. Also, the referral system at tertiary medical facilities, accessible directly by patients, has not been functioning properly.

In order to deal with these problems it is necessary to address how to re-establish an efficient referral system by means of reorganization of general hospitals and refurbishing worn-out facilities and equipment machinery. To this end, so as to benefit the maximum number of people the Ministry of Health elevated General Hospital Niksic in the north and General Hospital Kotor in the southern coastal region as core general hospitals for the provision of secondary medical services, and in their plans stressed the importance of improving the functioning of these hospitals.

Taking this into account, Japanese Grant Aid has been requested by the government of Serbia and Montenegro with the objective of improving healthcare services at target hospitals. This is to be achieved through the procurement of medical equipment at the Clinical Center,

General Hospital Niksic and General Hospital Kotor. In response to the request of the government of Serbia and Montenegro, the Japanese government decided to conduct a Basic Design Study and entrusted the study to the Japan International Cooperation Agency (JICA). JICA sent to the Republic of Montenegro a study team to conduct a Preparatory Study and Basic Design Study according to the following schedule.

Preparatory Study	: 5 September ~ 29 September 2005
Basic Design Study	: 15 March ~ 13 April 2006
Explanation on Draft Report	: 16 August ~ 1 September 2006

*Due to the Independence of Republic of Montenegro, Explanation on Draft Report was held with the government of Republic of Montenegro.

The Project was requested to target Montenegro healthcare sector which has been singled out for attention by the Montenegrin state, and more specifically with a view to improving healthcare services in the target hospitals. Items of equipment for procurement for the target hospitals, Clinical Center, General Hospital Niksic and General Hospital Kotor have been selected with due consideration to factors such as their beneficial effects, anticipated length of sustained use, installation environment and operations and maintenance. The basic policy has been to identify equipment and its quantities needed by the target hospitals, focusing mainly on the replacement of existing old equipment, but also with consideration given to the trends of other donors and organizations. Appropriate contents and number of the equipment is planned as a Grant Aid Project as follows.

Contents and Number of Planned Equipment

	Clinical Center	General Hospital Niksic	General Hospital Kotor
Number of items	40	40	36
Total quantity	91	96	60
Number of target department	14	14	12
Name of main target items	<ul style="list-style-type: none"> •Spiral CT Scanner •General X-ray Unit •Color Doppler •Mammograph Unit •Laparoscope and Urologicalscope Surgical System •Anesthesia Unit etc. 	<ul style="list-style-type: none"> •Mobile C-arm X-ray Unit •Mobile X-ray Unit •Mammograph Unit •Ultrasound for GY and OB •Operation Microscope etc. 	<ul style="list-style-type: none"> •Fluoroscopy Unit •General X-ray Unit •Mobile C-arm X-ray Unit •Color Doppler •Laparoscope and Urologicalscope Surgical System etc.

A total period of 10.8 months is requisite to complete the objectives of this Project where the objectives will be carried out by the Japanese government through Grant Aid. Total costs are estimated at approximately JPY 441 million (Japan: JPY 441 million, Montenegro: EURO 2,508).

The operation and maintenance budget for equipment supplied to the target hospitals through the Project will mainly come out of the Health Insurance Fund (HIF). The total expenses to be financed by each hospital for the operation and maintenance of new equipment as a proportion of average annual operation and maintenance expenditure of each target hospitals for the years 2003 - 2005, gives the modestly higher figures of the Clinical Center (2.2%), General Hospital Niksic (3.6%), and General Hospital Kotor (2.6%). Given the current improved state of hospital finances and financing through the state budget of the HIF, the budgetary allowance for running costs brought about by the Project is without any problem. Because the provision of equipment will augment the quality of medical service and efficiency in the hospitals, it can be expected that numbers of patients treated will rise. Along with the higher numbers of diagnosis and treatments, we will see an increase to hospital revenues paid both from the state budget and by patients.

Furthermore, since the Project plans to replace old existing equipment, we can expect to minimize both maintenance costs and power consumption.

Apropos of the objective of procuring equipment, the replacement of existing obsolescent equipment in the Clinical Center is to be the main priority, while in the district general hospitals only basic equipment is to be provided. Since the days of the former Republic of Yugoslavia the Clinical Center has been the main referral center. There is a large pool of talented medical staffs who have experience of working, overseas study, and other training in the metropolitan cities of Belgrade and Zagreb, in European countries, the United States, and in Japan. Staff at the general hospitals have links to those in the Clinical Center, and with an adequate distribution of capable personnel in each department of the target hospitals, no technical problems are envisaged in operation, diagnosis or treatment using equipment to be provided.

Because the effects anticipated from the Project are as outlined below, it is concluded that putting the main plan into action, paid for by Grant Aid Project, is both appropriate and meaningful.

1) **Direct Effects**

- The quality of secondary medical level services to roughly 410,000 people (some 66% of the total population) will be improved by the procurement of medical equipment in the Clinical Center and in General Hospital Niksic and Kotor - the main hospitals in the north and southern coastal region.
- The quality of tertiary medical services to all 620,000 of Montenegro's inhabitants will be improved by the procurement of medical equipment in Montenegro's only tertiary hospital.
- The patients now being sent outside the country (some 7,115 in 2005) will be able in future to receive diagnosis and treatment within Montenegro. Reducing the patients' burden in accessing medical services and the increased revenue from medical services at Montenegrin hospitals will have a positive impact on the country's medical finances.

2) **Indirect Effects**

- The referral system within Montenegro will be strengthened.
- Montenegro's national health indicators will be improved.

The following recommendations are proposed too ensure the smooth realization of this Project, the smooth application of the newly procured equipment by the target hospitals and the achievement of initial object:

- **Modernization of Structure and Management of Hospitals**

Joint ownership and centralized use of medical equipment among different departments of the target hospitals is expected in order to most efficiently and effectively use the medical equipment procured under the Project. However, at the present time the actual disposition of facilities (including disposition of the wards) in each department of the target hospitals is still based on an inefficient vertical structure, and there is limited ability to promote joint ownership and centralization of medical equipment for improved efficiency.

It follows that only with a radical reconsideration of the departments in present day

facilities of target hospitals, together with more positive concentration of diagnostic units, reconsideration of ward arrangements, and based on all of these reconfiguration of the organization and personnel, with the setting up of a jointly owned and centralized management system for medical equipment, can one hope for improvements in the effective functioning of hospitals.

- **Stabilization of Health Insurance Fund**

Running and maintenance costs for equipment procured for the target hospitals in the Project will be financed by the HIF – the hospitals’ main source of income. Montenegro aims to stabilize HIF by adjusting the scale of its hospitals and improving its insurance premium collection system. In so doing, the fund should be on a sound footing within a few years. However, from a long-term perspective, with a weak economic foundation and a precarious government fiscal situation, what is needed is not only an increase in medical resources, but the construction of a system that will promote the stabilization of the insurance fund through the suitable placement of medical workers, the introduction and expansion of a tender system for the purchase of medical equipment and medication and a further reduction in annual expenditure on medical service provision through the establishment of strict standards in medical prescriptions.

- **Improvement of Standards for the Medical Care of Patients**

Since it is the aim of Montenegro to join the EU, the modernization of hospital functions is now topical, with the aim of conforming to the standards of medical services in EU countries. There is a need to promote more active consideration to issues such as guaranteeing the privacy of patients in diagnosis and treatment areas and in wards, installing basic features such as curtains surrounding each bed in wards or in examination and treatment areas, and providing privacy for patients and their families. At the same time it is hoped that plans are made to modernize medical treatment in areas such as the obtaining of informed consent, offering detailed guidance concerning the taking of medicines, completion of a medical information system so as to make hospital services logical and effective, shortening of waiting times for diagnosis and treatment, and pushing ahead with measures to realize standards of patient treatment.

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Chapter 1

Background of the Project

Chapter 1 Background of the Project

In 2003 the total number of deaths in Montenegro stood at 5,704, with a prevalence of illnesses broadly similar to that in developed countries. Circulatory diseases and cancers accounted for over 67% of deaths. Also, as the number of Internally Displaced Persons (IDP) and refugees increased, the improvement of medical health services given to this stratum of impoverished citizens has become a major issue.

In 2005 the Montenegro Ministry of Health in its master plan for national health policy “Development of the Health Care System in Montenegro for the period 2005-2010” was settled, and in order to fulfill these policies there is a concrete plan of action aimed at strengthening the referral system and improving the functioning of hospitals.

However, giving the worsening state of the national economy and state finances, there has been a marked reduction in finances allocated to the health sector, and in consequence facilities and medical equipment have for the large part not been renewed at each medical facility since the 1990s'. In recent years both the quality and volume of public health service has fallen, and the resulting poor function of the referral system has become a major problem.

(1) Basic Health Indicators

According to population statistics data, in 2003 the crude birth rate in Montenegro was 13.5 (per 1,000), the death rate had fallen from 11.3 in 1953 to 9.2, and the natural population increase fell from 9.1 in 1991 to 5.1 in 2001. Mean life expectancy was 75.2 years in 2003 (being 71.5 for males, and 78.7 for females) with some 8.3% of the population aged over 65 years and 28.6% aged less than 19 years.

Child mortality rates since 1950 have continued on a downward trend, being 7.8 per 1,000 births in 2004, while the under-5 year mortality rate stood at 9.5 per 1,000. Although the maternal mortality rate was nil in 2004, 2 maternal deaths were reported in 2001, and in 2002, 99% of deliveries were attended by trained personnel.

In 2003, preventive vaccination rates stood at 95% for tuberculosis, and 89% for each of diphtheria, tetanus, whooping cough, polio, smallpox, measles, mumps and rubella. However, in several regions of the country, preventive vaccination rates remained at 70%. It is noted that about 10% of the Montenegrin population consists of IDP or refugees and there is a distinct possibility that the figures for infant mortality rates, maternal mortality rates, and preventive vaccination rates for this sector of the population may not be reflected in the official statistics.

Table 1 Health Indicators

	1991	2001	2002	2003	2004
Total population	591,269	662,195	665,203	618,233	620,533
Natural increase rate(%)	0.64	0.38	0.37	-	-
Life expectancy	75.2	73.4	73.0	74.0	73.3
Infant mortality rate per 1,000 live births	11.1	14.6	10.8	11.0	7.8
Children under 5 mortality rate	11.14	15.73	11.41	12.1	9.5
Maternal mortality rate per 100,000 live births	31.23	23.53	-	0	0

Source : Statistical Yearbook of the Republic of Montenegro 2005

(2) Health Conditions

The total number of deaths in Montenegro during 2003 stood at 5,704 with prevalence of illnesses roughly akin to that of developed countries. Circulatory diseases account for over 50% of causes of death, followed by tumours (16.9%). The most common causes of death include heart disease, lung disease, cerebrovascular disease, ischemic heart disease, diabetes, head injury, chronic illness, tumours and liver disease and make up 67% of the total causes of death. The main factors responsible for the prevalence of circulatory diseases appear to be lifestyle habits of smoking, alcoholism, poor diet and lack of exercise and also the external risks of polluted air, food and water. Deaths due to poisoning and trauma are put down to poor working conditions and the lack of a welfare system for workers.

In 2003, a total of 788,012 outpatients were attended to, by age the largest proportion of which were infants between the age of 0-6 (32.2%). Meanwhile, respiratory diseases accounted for the largest proportion of outpatient illness.

(3) Healthcare Personnel and Resources

Compared with standards of other European Union (EU) and Central and Eastern Europe (CEE) countries, the medical resources Montenegro has to work with are not over-excessive. In 2001, there were a total of 7,123 public health care employees; of these, 5,339 (75.0%) were medical workers, and 1,784 (25.0%) non-medical workers. Of the 5,339 medical workers, 1,563 (29.3%) were highly qualified workers with 1,127 doctors (21.1%), 269 dentists (5.0%), and 99 pharmacists (1.9%). Both patient beds and doctor numbers were seen to be on a par with many developed nations.

Table 2 Health Care Capacities in Montenegro and Selected Countries of Europe

Country	Number of beds/100.000	Number of doctors/100.000	Number of nurses/100.000	Number of pharmacists /100.000
Germany	919	358	930	58
Great Britain	417	164	497	58
Czech Rep.	855	337	920	49
Slovenia	543	218	696	38
Montenegro	643	176	412	14

Source: Strategy for Health Care Development in Montenegro, 2003

(4) Referral System of Healthcare

Montenegro's healthcare system comprises a referral system of primary, secondary and tertiary medical facilities with health centers, health stations, general hospitals, special hospitals, the Clinical Center and military hospital forming a network for treatment and pharmaceutical research. There are a further 153 private hospitals across the country but at present the private sector is not integrated into Montenegro's public healthcare system.

There are 18 health centers and 3 health stations across the country acting as primary medical facilities, with approximately one in each city. Nationwide, there are 7 general hospitals which act as secondary medical facilities. Montenegro's only tertiary medical facility (the Clinical Center) is also capable of acting as a secondary medical facility, hence together with the 7 general hospitals, the public is able to receive secondary medical services in all 21 regions of Montenegro. Additionally, there are 3 special hospitals offering special treatment (in psychiatry, orthopedics, lung diseases and tuberculosis) which are not part of the referral system.

(5) Health Insurance System

The majority of the financing of Montenegro's public healthcare system comes from the Health Insurance Fund (HIF). For the main part, medical facilities are refunded via the HIF rather than receiving direct payment from patients. 96% of HIF funding in 2005 came from insurance fees, including pension and unemployment insurance as well as health insurance paid by employers, employees, the self-employed and agricultural workers. The remainder of the funding comes out of the government budget and from additional sources. Health insurance is compulsory for all Montenegrin citizens, payable at a rate of 13.5% of the salary for employees and the self-employed, with employers and employees contributing half the amount each. The HIF is in the process of creating reciprocal healthcare agreements with former Yugoslavian and European countries whereby nationals from those countries will be covered for medical treatment in Montenegro by their own national health insurance, and the costs of any medical treatment received while in

Montenegro will be refunded to the Montenegro HIF by their national health insurance funds.

(6) National Healthcare Development Plan

The Ministry of Health devised a new Master Plan “Development of Health Care System in Montenegro for the period 2005-2010” in 2005 with its major health objectives as follows:

- 1) To plan and organize development of capacities in order to provide equal access to health care
- 2) To define the priority fields for development
- 3) To bring the health care system in state of optimal operation and in line with socio-economic development
- 4) To increase in efficiency and quality of health care through changes in organization and functioning
- 5) To improve management of health care system

In order to achieve above objectives, specific activity plans are mentioned, within the “Improvement referral system” and “Hospital Reconstruction”.

Furthermore, based on the UN Millennium Development Goals, the government of Montenegro has set healthcare targets of reducing the child mortality rate, improvement in maternal and child health, and eradication of HIV/AIDS, malaria and T.B. In addition, in response to the “Poverty Reduction Strategy Paper for Montenegro” of 2003, the “Development Poverty Reduction Strategy” (DPRS) was approved with improvements to maternal health and the child mortality rate established as development indicators in the healthcare field.

(7) Role of the Targeted Hospitals in the Health Sector

The three target hospitals for the Project are i) the Clinical Center, Montenegro’s only tertiary medical facility, ii) General Hospital Niksic, which provides secondary medical services mainly to Montenegro’s northernmost population, and iii) General Hospital Kotor which covers the relatively densely populated southern coastal region. In its role as a tertiary facility, the Clinical Center in the capital serves the entire Montenegrin population of approximately 620,000 people. Meanwhile, in their function as secondary medical facilities, the Clinical Center and the two General Hospitals together serve a population of roughly 410,000, enabling 66% of the public to access a higher quality of service as a legacy of the Project.

Table 3 General Status of Target Hospitals (2005)

	Clinical Center	General Hospital Niksic	General Hospital Kotor
Location	Podgorica	Niksic	Kotor
Director	Dr. Miodrag Durovic	Dr. Miso Pejakovic	Dr. Nebojsa Bjelica
Year of Establishment	1974	1887 (reconstruction in 1991)	1979 (reconstruction in 1997)
Number of Beds	827 beds	248 beds	170 beds
Bed occupancy rate	65~75%	52%	60%
Number of operation room	12 rooms	4 rooms	4 rooms
Covering Area	All areas of Montenegro (tertiary level) Podgorica, Danilovgrad, Kolasin (secondary level)	Niksic, Pluzine, Savnik Total 3,472 km ²	Kotor, Tivat, Herceg-Novi, Budva Total 738 km ²
Covering population	Approx. 620,000 (tertiary level) Approx. 200,000 (secondary level)	Approx. 91,000	Approx. 110,000
Time to Clinical Center (by car)	-	60 minutes	120 minutes
Annual referral patients	5,296 (To Belgrade CC) 1,841 (To Former Yugoslavian countries, other countries)	127 (To Clinical Center) 15 (To General Hospital Kotor)	102 (To Clinical Center) 57 (To Special hospital)

Source: Basic Study Questionnaire

- The Clinical Center

The Clinical Center is Montenegro's sole tertiary medical facility, with additional functions as a center for medical education and research. As a tertiary medical facility it has as its beneficiary population the entire population of 620,000 citizens. The Clinical Center carries a large responsibility as it also provides secondary level medical services to the 200,000 people living in Podgorica and surrounding areas. In 2005, of the 37,656 patients passing through its doors, 18.9% or 7,115 patients were transferred to hospitals outside of the republic, mainly to the Republic of Serbia. Montenegro formally became independent of a confederated union of Serbia and Montenegro in June, 2006. It will be a pressing need to establish the domestic medical system including tertiary medical level from now on.

- General Hospital Niksic

Niksic is an industrial city mainly for steel manufacturing and beer production. It is Montenegro's second largest city with a population of 75,000 with many people attracted in to the city from other regions. Niksic lies roughly in the center of the country with no other large cities to its north; it therefore acts as the access point for healthcare services for Montenegro's northernmost citizens. Resultantly, General Hospital Niksic serves 90,000 people from both the city itself and surrounding areas. However, road conditions in the surrounding areas are poor and access to medical facilities in the winter season is difficult. It is noted that health indicators in the many mountainous areas around Niksic are worse than for other regions.

Due to Montenegro's financial situation, there have been delays to the injection of funds into the medical resources of this depopulated region, and since General Hospital Niksic was built in

1991, hardly any of the medical equipment has been renewed. Consequently, the most frequently used diagnosis equipment is no longer operating optimally. Furthermore, the distance between Niksic and Podgorica is 50km or one hour by car; the route is mountainous and freezing winter weather conditions can increase travel times to two hours.

Hence, the provision of equipment to this recipient facility is highly relevant in its capacity to better serve Montenegro's northernmost population as well as its broader area.

- General Hospital Kotor

The city of Kotor lies to the west of Podgorica, separated by a mountain range in between. It is a major city in the region, which lies along the Adriatic Sea stretching from north to south. General Hospital Kotor serves approximately 110,000 people from Kotor and surrounding areas.

In addition, due to difficulty in the access of the Clinical Center in Podgorica for population from border area of Bosnia and Hercegovina and Croatia, General Hospital Kotor is currently acting as an access point for secondary medical services for the whole southern coastal population, allowing these border populations to receive treatment.

When Kotor was hit by the major earthquake of 1974, General Hospital Kotor was severely damaged leading to its reconstruction in 1997. Much of the medical equipment installed was that which had escaped intact after the earthquake, and most of it is still in use today. The hospital functions would be greatly strengthened through replacement with new equipment. Kotor and Podgorica lie 100 km apart with a journey time of 2 hours through the mountains. In winter, freezing road conditions can double this journey time.

Supporting this core medical facility in the region bordering the Adriatic Sea is highly relevant to the Project.

Chapter 2

Contents of the Project

Chapter 2 Content of the Project

2-1 Basic Design of the Requested Japanese Assistance

2-1-1 Goal and Objectives of the Project

Having revised the referral system for patients from the primary medical facilities (health centers and health stations), secondary medical facilities (general hospitals), tertiary medical facilities (the Clinical Center) and special hospitals, and further developed the health care services offered at these medical facilities, healthcare indicators have been maintained at a fixed level.

In 2005, the Montenegro Ministry of Health in its master plan for national health policy “Development of the Health Care System in Montenegro for the period 2005-2010” listed the following as its main aims: i) to plan and organize the development of capacity in order to provide equal access to health care, ii) to define the priority areas for development, iii) to bring the health care system into a state of optimal operation in line with socio-economic development, iv) to increase the efficiency and quality of health care through changes in organization and functioning, and v) to improve management of the health care system. In order to fulfill these policies there is a concrete plan of action aimed at strengthening the referral system and improving the functioning of hospitals.

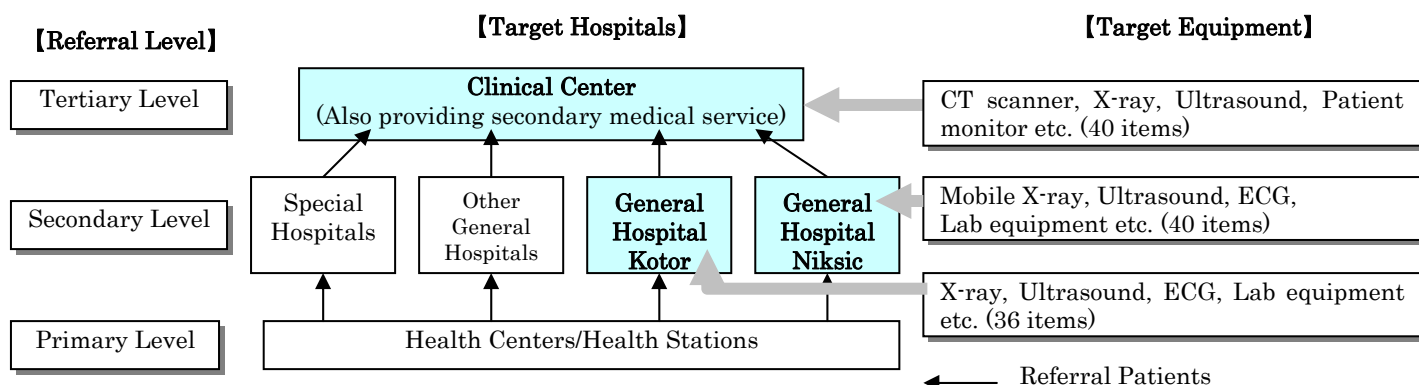
However, given the worsening state of the national economy and state finances, there has been a marked reduction in finances allocated to the health sector, and in consequence facilities and medical equipment have for the large part not been renewed at each medical facility since the 1990s. In recent years both the quality and volume of public health service have fallen, and the resulting poor function of the referral system has become a major problem.

Under these circumstances, by re-equipping the Clinical Center (tertiary facility, providing also secondary medical service) and the regional center facilities of General Hospital Niksic and General Hospital Kotor (secondary facility), the Japanese Grant Aid Project (hereafter: the Project) seeks both to raise the quality and volume of medical services provided in Montenegro and to improve and strengthen the referral system. In so doing, it is anticipated that the health of the citizens of Montenegro will be raised to a higher level.

2-1-2 Basic Concept of the Project

In order to achieve success in the above-mentioned goals of the Project, the three key medical facilities of the Clinical Center (tertiary facility) and General Hospital Niksic and General Hospital Kotor (secondary facility) have been chosen as the target hospitals of the Project. The re-equipping

of these target hospitals by replacing worn-out equipment is expected to improve their service capability as well as to enable the establishment of an efficient referral system.



2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

(1) Basic Design

The Project was requested to target Montenegro healthcare sector which has been singled out for attention by the Montenegrin state, and more specifically with a view to improving healthcare services in the target hospitals. Items of equipment for procurement for the target hospitals, the Clinical Center, General Hospital Niksic and General Hospital Kotor have been selected with due consideration to factors such as their beneficial effects, anticipated length of sustained use, installation environment and operations and maintenance. The basic policy has been to identify equipment and its quantities needed by the target hospitals, focusing mainly on the replacement of existing old equipment, but also with consideration given to the trends of other donors and organizations.

Selection of the equipment has been made in accordance with the basic cooperation principles of Japanese Grant Aid and based on the following basic criteria.

Basic criteria for procurement of medical equipment	
1	In principle, the medical equipment to be procured should achieve high benefit effect. In addition, items which need complicated and/or frequent maintenance services and high running cost should not be included in the procurement list. The application of centralization system of diagnostic equipment should be considered to avoid duplications of equipment in several departments of the hospital.
2	Items mainly focusing on diagnostic purpose usable by multi-ranged medical departments with high benefit effects for the majority of the people in Montenegro should be given the highest priorities, such as image diagnostic equipment, diagnostic endoscope.
3	The roles and functions of the target hospitals in the referral system in Montenegro should be considered. For instance, CT scanner is going to be studied for Montenegro Clinical Center only.
4	Items requiring complicated maintenance services and high management cost such as multi-slice CT and other digitalized medical equipment are not suitable for the Japanese Grant Aid scheme. Digital X-ray system requires complete renovation of the computer system of the hospital.
5	The replacement of existing equipment in order to avoid additional maintenance and management cost.
6	Items usable only in limited medical area with low beneficial effect and/or academic research purpose are not accepted in the Japanese Grant Aid scheme.
7	To delete medical equipment causing difficulties with the procurement by the general tender base in Japanese ODA Guidelines because of the requirement of specialized specification, products by the limited manufacturers, etc.
8	The medical equipment considered to be procured in the local market should be prepared by the recipient country as a fundamental condition for the acceptance of Grant Aid project.

(2) Policy on the Choice of Equipment Specifications

Equipment designated for procurement in the Project will be appropriate to the skill level of healthcare staffs such as doctors, nurses and clinicians at the Clinical Center and two target general hospitals. Grade and quantity of equipment will be suitable in function and scope of medical activities to enable the medical facilities to fulfill their role as tertiary and secondary medical facilities in healthcare sector of Montenegro. Priority will be given to equipment that does not require special measures after installation for frequent maintenance or regular procurement of consumable.

(3) Policy on Operation and Maintenance

As the target hospitals operate on a limited budget and attempts are made to reduce operating and maintenance costs, the Project will plan the procurement of equipment with particular attention paid to operating costs. The main operating costs likely to arise from the new equipment are those consumable such as reagents, electrodes, printer paper and light bulbs. Regarding the storage and management of these reagents and consumable, procured medical equipment of which manufacturers offer after care services easily and inexpensively available either in Montenegro or from neighboring countries will be taken in consideration for procurement for a guaranteed supply of consumable and spare parts.

(4) Policy for Operation and Maintenance Skills in the Target Hospitals

There are already many qualified doctors and medical staffs at the target hospitals with enough experience in using the equipment planned for procurement, therefore no special measures are deemed necessary for the Project such as practicing of the Soft Component. However, sufficient instruction in the operation of equipment and methods of maintenance will be given for the procurement.

(5) Policy for Consideration of the Environment

In the Project, there are no items of equipment to be procured that are of particular environmental concern. Furthermore, sterilizers at all target hospitals are to be replaced, thereby hospital infectious control means will be enhanced.

(6) Policy on the Period of the Execution of the Project

The period of execution of the Project is fixed as one fiscal year. Procurement including from third-party countries, transportation and installation period will be carefully coordinated to ensure a term of implementation.

2-2-2 Basic Plan (Equipment Plan)

(1) Total Concept of the Project Planning

Target hospitals of the Project are the Clinical Center, General Hospital Niksic and General Hospital Kotor, all have important roles in Montenegro's medical services. In the Project, 40 items of equipment (91 pieces) such as spiral CT scanner, general X-ray unit, color doppler, mammograph unit etc., are to be procured for the Clinical Center. Meanwhile, 40 items of equipment (96 pieces) such as mobile C-arm X-ray unit, color doppler etc., are to be procured for General Hospital Niksic. 36 items of equipment (60 pieces) such as general X-ray unit, color doppler, ECG, electrosurgical unit etc., are to be procured for General Hospital Kotor.

With respect to infrastructure conditions and electric power supplies at each hospital, measurement of power capacity, voltage and frequency fluctuation confirmed that no barriers to operation of the equipment are likely. Nor are road conditions expected to cause difficulties, with easy access in all weathers. Trunk roads from the main port of Montenegro, Bar port, to the all target hospitals are all in a good condition.

Table 4 Contents and Number of Planned Equipment

	Clinical Center	General Hospital Niksic	General Hospital Kotor
Number of items	40	40	36
Total quantity	91	96	60
Number of target department	14	14	12
Name of main target items	<ul style="list-style-type: none"> •Spiral CT Scanner •General X-ray Unit •Color Doppler •Mammograph Unit •Laparoscope and Urologicalscope Surgical System •Anesthesia Unit etc. 	<ul style="list-style-type: none"> •Mobile C-arm X-ray Unit •Mobile X-ray Unit •Mammograph Unit •Ultrasound for GY and OB •Operation Microscope etc. 	<ul style="list-style-type: none"> •Fluoroscopy Unit •General X-ray Unit •Mobile C-arm X-ray Unit •Color Doppler •Laparoscope and Urologicalscope Surgical System etc.

(2) Equipment Plan

1) Radiological Equipment

• Spiral CT scanner

The Project plans to procure spiral CT scanner for replacement of the existing equipment at the Clinical Center. The replacement of spiral CT scanner, which has low energy consumption for X-ray tubes and relatively low maintenance, operation cost is considered appropriate, on account of this replacement of existing old CT scanner, sufficient benefits will be expected. The full scan time speed which is the most important factor to determine the grade of spiral CT scanner will be chosen for a conventional type – cycle time is less than one second. Only products of manufacturers with local agents in neighboring countries to guarantee supply of sufficient maintenance services will be taken into consideration for procurement.

• Fluoroscopy Units

Regarding Fluoroscopy Units, since LAN system and computers are not disposed to each department in General Hospital Kotor, an analog type X-ray unit with conventional films will be appropriate to be procured. Even though the existing equipment is a bedside operating type, the project plans to procure a remote control type unit for the reason of operational safety.

• Ultrasound Diagnosis Unit

On the assumption of being centrally managed in the image diagnosis departments of each target hospital, color doppler ultrasound and their accessories such as convex, transvaginal, sector probe, linear probe, microconvex probe and probe for urology will be planned to procure for diagnosis of abdomen part, cardiovascular system and infant brain. Regarding the ultrasound for Obstetric and Gynecological department in where this equipment is frequently used, B/M mode

ultrasound with convex, linear and transvaginal probes are planned to be procure.

2) Laboratory Equipment

Laboratory Equipment will be procured for the replacement of existing old equipment. Under the present situation, the budget necessary for consumable and maintenance service is secured at each target hospital. However, the specification of the equipment will be planned for securing manufacturers with local agent offering the aftercare service from the neighboring countries such as Serbia and Croatia, and open type reagent is also planned to the utmost for avoiding a new burden for maintenance and operation.

3) Equipment for the Operating Room

Equipment for the operating rooms is planned as basically the same grade as that of existing equipment. Electro-hydraulic adjusting operating tables, conventional shadow-free satellite operating lights and electrosurgical unit (bi/mono polar type to enable incisions, arrest of bleeding and coagulation) are planned. Regarding anesthetic unit, only oxygen and air piping is equipped as a medical gas supply at the target hospitals, thus build-in compressor and isoflurane vaporizers, commonly used in Montenegro, are planned.

4) Endoscopes

Fiber endoscopes are planned to be replaced to the old existing equipment for the Project. The plural number of gastrofiberscope a frequently used item is planned to secure enough time for washing to prevent infectious disease. Because accessories of endoscope unit such as light sources and suction pumps are relatively new and in a good condition in General Hospital Kotor, only main units of endoscope will be replaced.

Laparoscopic surgeries in the obstetric and gynecological field, gallbladder and urologic surgery are performed frequently in Montenegro. At present there is an old laparoscope and urologicalscope set in laparoscope rooms. However, sufficient treatment seems to be unable to serve during surgeries due to old combined components of the equipment of various manufacturers. Based on present operation activities, main unit of the scope, light source, suction unit, endoscopic electrosurgical unit and electrodes, CO₂ gas insufflator, monitor, video apparatus, and general forceps are planned for the components of the equipment.

5) Equipment for Intensive Care Unit: ICU

Standard parameters for patient monitors such as temperature, ECG, respiration, NIBP, and SpO₂ are considered appropriate. Moreover, because a nurse center is not allocated separately, it is not necessary to procure a central control monitor; independent bedside monitors would be appropriate. Syringe type infusion pumps are planned to procure due to low level of liquid leakage, besides open type with syringes widely available in Montenegro will be planned for infusion pumps. Specification of ventilator with technical services offered by local agents from Serbia or Croatia will be planned.

6) Sterilizers

In each department of target hospitals, the volume of sterilizing items is high because centralized sterilization system is not established sufficiently, so relatively high capacity sterilizer units (approximately 100 liters) are planned. On the other hand, the reason for the building structure of sterilization room in General Hospital Niksic, the procurement of high capacity sterilizer requires perplexing renovations for the installation work and additional cost. Therefore, several number of small capacity vertical steam sterilizers, easy to be installed are planned for General Hospital Niksic instead of high capacity ones (same model as the existing equipment).

2-2-3 Basic Design Drawing

Table 5 Equipment List for the Clinical Center of Montenegro in Podgorica

No	Clinic	Department	Equipment	Qty.	Intended Use	Basic Specification and Notes
1	Internal Clinic	Internal Clinic	Gastrofiberscope Video System (3 Gastrofiberscopes, Monitor System, Light Source, Suction Unit, Coagulator)	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of esophagus and gaster	Composition :Gastrofiberscope 3 units, Video monitoring system, Lightsource, Suction Pump, Coagulator, Gastrofiberscope: Field of view:100° or more, Depth of field:3 to 100mm, Distal end outer diameter:withiñ9.5 to 9.8mm, Working length: 1,030mm or more, Video monitoring system: Color system: PAL, Image sensor: CCD, TV Monitor: CRT or TFT / size 14 inch or more, Lightsource: Halogen 150W or more, or Xenon 75W or more, Suction Pump: Pressure: -80kPa or more, Bottle capacity: 1.4L or more, Coagulator: Type: Monopolar & bipolar, Cutting:200W or more, Coagulation:120W or more, Bipolar:120W or more
2			Duodenofiberscope	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of duodenum	Fields of view: 80°, Depth of Field: 5 to 60mm or more, Distal end outer diameter: Withiñ12.6 to 13.0mm, Working length: 1,235mm or more
3			Colonofiberscope	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of large intestine	Fields of View: 120° or more, Depth of Field: 5 to 100mm or more, Distal end outer diameter: Withiñ12.6 to 13.8mm, Working length: 1,660mm or more
4			Washing Unit for Endoscope	1	To wash fiberscopes and related accessories for infectious disease prevention	Washing Method: Washing with electrolyzed acid water or Washing with detergent and water sterilized by Ultraviolet Ray or Washing with detergent and water, and alcohol flushing
5			ECG	2	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standad12leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db) , Display Type: 3 channel display or more
6			Defibrillator	1	To be Used for cardiopulmonary resuscitation in emergencies by using a countershock for restoring breathing rhythm in times of ventricular fibrillation, flutter, ventricular tachycardia	Output energy: Max. 200J or more, Alarm function: Provided, Monitor: Display: ECG, Power source: AC220V/ 50Hz and Rechargeable battery
7	Neonatology	Neonatology	Infant Ventilator	3	To be used for mechanical artificial breathing for neonate	Oxygen concentration: 21 to 99% or more wide range, Flow: 3 to 30 L/min or more wide range, Inspiratory time: 0.1 to 2.0 sec or more wide range, Breathing frequency: 5 to 150bpm or more wide range, Alarms: Air pressure and apnea Compressor: Equipment should be built-in /or fixed on ventilator main unit cart
8			Infant Warmer	1	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
9			ECG for Pediatric	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standad12leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db), Display Type: 3 channel display or more
10			Infant Incubator	2	To care for low weight and immature neonate	Control: Servo and manual control, Air temp. range: +25 to 37°C or more wide range, Skin temp. control range: +35 to 37.5°C or more wide range, Alarms: Provided
11	Intensive Therapy Section	Intensive Therapy Section	Patient Monitor for Pediatric	4	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2,NIBP and temperature parameters	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
12			ECG for Pediatric	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standad12leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db), Display Type: 3 channel display or more
13			Suction Unit (Wall Mount Type)	8	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to pipeline pressure range, Suction bottle: Within 1,200cc to 1,400cc, 1 pc., Vacuum regulator: Provided
14	Institute for Children Diseases	Anesthesia and Reanimation Section	Anesthesia Unit with Monitor	1	To anesthetize patient for surgical operations	Composition: Anesthesia unit, Ventilator, Vaporizer, Gas Cylinder, Monitor Anesthesia main unit: Flow meter unit: O2, N2O, AIR, Vaporizer: Isoflurane, Ventilator: Equipment should be built – in /or fixed on Anesthesia unit cart, Type: Integrated electronically controlled, Tidal volume: 100 to 1,200 ml or more wide range Monitor : Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
15			Infant Warmer	1	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
16	Surgical Clinic	Surgical Clinic	Electrosurgical Unit	1	To cut and coagulate with high frequency current electricity	Type: Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more
17			Suction Unit	2	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
18	Pediatric Clinic	Pediatric Clinic	Bronchofiberscope for Pediatric	1	To be used for bronchus endoscopy examination for pediatric	Field of view: 100° or more, Depth of field: 3 to 50 mm or more, Distal end outer diameter: Withiñ2.7 to 4.9 mm, Working length: 600 mm or more
19			Gastrofiberscope for Pediatric	1	To be used for pediatric endoscopy examination for inflammation, ulceration, cancer and polyp of esophagus and gaster	Field of view: 100° or more, Depth of field: 3 to 50 mm or more, Distal end outer diameter: Withiñ5.2 to 7.9 mm, Working length: 925 mm or more
20			Colonofiberscope for Pediatric	1	To be used for pediatric endoscopy examination for inflammation, ulceration, cancer and polyp of large intestine	Field of view: 120° or more, Depth of field: 3 to 100mm or more, Distal end outer diameter: Withiñ11.2 to 13.4 mm, Working length: 1,330 mm or more

21	Institute for Children Diseases	Pediatric Clinic	Duodenofiberscope for Pediatric	1	To be used for pediatric endoscopy examination for inflammation, ulceration, cancer and polyp of duodenum	Field of view: 80° or more, Depth of field: 5 to 60 mm or more, Distal end outer diameter: Within 12.6 to 13.0 mm, Working length: 1,235mm or more
22			Fiberscope System (Suction, Lightsource, Washing unit)	1	To procure necessary accessories for use of fiberscopes. It is composed of suction, lightsource and washing unit for preventing infectious disease	Composition: Suction Pump, Lightsource, Washing unit Lightsource: Halogen 150W or more, or Xenon 75W or more, Suction Pump: Pressure: -80kPa or more, Bottle capacity: 1.4L or more, Washing Method: Washing with electrolyzed acid water or Washing with detergent and water sterilized by Ultraviolet Ray or Washing with detergent and water, and alcohol flushing
23			ECG for Pediatric	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standard 12 leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db) , Display Type: 3 channel display or more
24		X-ray Section	Color Doppler (4 probes)	1	To be used for various ultrasound diagnosis such as diagnosis of abdominal organs, surface, cerebral diagnosis for infant and cardiovascular, by using color display	Scanning Methods: Electronic convex, Electronic linear, Electric Phased Array Sector, Beam former: Digital, Monitor: 15-inch color monitor or large size, Probe: Convex, Linear, Sector, Trans-rectal, Imaging Mode: B, M, D (PWD, CWD), Printer: Color, Probe selector: 3 connectors or more
25			General X-ray Unit	1	To be used for diagnosis of chest, joints and fracture by taking X-ray images of patients fixed on a table or a ladder stand	Composition: X-ray generator, X-ray tube, X-ray tube support, Floating top bucky table, Bucky stand, X-ray Generator: 50kW or more, kV range: 40 to 150kV or more wide range, mAs range: 10 to 500mA or more wide range, X-ray generator: Inverter type, X-ray Tube heat capacity: 300kHU or more, X-ray Tube Support Unit: Type: Floor support, Bucky Table: Floating-top Bucky Table
26	Surgical Clinic	Operation Rooms	Operation Table	2	To fix the position of patients during various surgical operations	Main unit operation: Electric hydraulic operation, Table top Dimensions: 1,900 x 490 mm or more, Elevation range: 730 mm to 1,000 mm or more wide range, Trendelenburg: 25° or more, Reverse trendelenburg: 25° or more, Back section: 60° up or more, 40° down or more
27			Operation Light	2	Operation light for surgical operations	Ceiling type, Halogen light Light intensity :Main Max. 110,000 lux or more, Sub Max. 95,000 lux or more, Focus control: Provided
28			Anesthesia Unit with Monitor	3	To anesthetize patient for surgical operations	Composition: Anesthesia unit, Ventilator, Vaporizer, Gas Cylinder, Monitor Anesthesia main unit: Flow meter unit: O2, N2O, AIR, Vaporizer: Isoflurane, Ventilator: Equipment should be built - in /or fixed on Anesthesia unit cart, Type: Integrated electronically controlled, Tidal volume: 100 to 1,200 ml or more wide range Monitor : Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
29			Suction Unit	3	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
30			Laparoscope and Urologicalsurgical System	1	To be used for abdominal and urological laparoendoscopic surgery such as cholelithotomy and prostatomegaly etc.	Composition: Telescopes, Insufflations Unit, Light source, Electro-surgical unit, Suction unit, Monitor system, Forceps etc. Telescope: Laparoscope: 10mm, 0°, 10mm, 25° or 30° Cysto-Urethroscope: 4mm, 0° or 30°, 4mm 70° Optical Ureterotome: 4mm, 0° or 12°, Resectoscope: 4mm, 30°, Insufflations Unit: CO2 Gas, Light source: Xenon, Electro-surgical unit: High frequency type, Monopolar/Bipolar, Suction unit: Suction/Irrigation, Monitor system: PAL system, Video system : PAL, VHS or DVD, TV Monitor: PAL system, Monitor: Color, 19 inch or more Main composition of accessories: Trocar, Grasping forceps, Scissor, High Frequency Cable, Probe, High Frequency Cable, Trolley
31	Electrosurgical Unit	1	To cut and coagulate with high frequency current electricity	Type :Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more		
32	Intensive Care Unit	Intensive Care Unit	Patient Monitor	10	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2, NIBP and temperature parameters.	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
33			Ventilator	2	To be used for mechanical artificial breathing	Oxygen concentration: 21 to 99% or more wide range, Tidal volume: 100 to 1,300 ml or more wide range, PEEP: 0 to 20 cmH2O or more range, Breathing frequency: 8 to 40 times/min. or more range, Alarms: Air pressure and apnea
34			Bronchofiberscope	1	To be used for bronchus endoscopy examination	Field of view: 120° or more, Depth of Field: 3 to 50 mm or more, Distal end outer diameter: Within 4.8 to 5.9 mm, Working length: 600 mm or more
35	X-ray Center	X-ray Center	Spiral CT Scanner	1	To be used for imaging diagnosis for head, chest, abdominal, spinal and extremities disease	Composition: Gantry, Patient coach, X-ray generator, X-ray tube, Patient monitoring system, Computer system, Software, Operation console, Laser imager, Injector, 360° Min. scan time: 1.0 or less, Slice thickness: 1-2-3-5-7-10mm or more selection, Scan field: 200-400mm or more, X-ray tube heat capacity: 3.5MHU, Monitor Matrix: 512x512 or more, DICOM: 3.0: Adjustable
36			Color Doppler (4 probes)	1	To be used for various ultrasound diagnosis such as diagnosis of abdominal organs, surface and cardiovascular, by using color display	Scanning Methods: Electronic convex, Electronic linear, Electric Phased Array Sector, Beam former: Digital, Monitor: 15-inch color monitor or large size, Probe: Convex, Linear, Sector, Trans-rectal, Imaging Mode: B, M, D (PWD, CWD), Printer: Color, Probe selector: 3 connectors or more

37	X-ray Center	X-ray Center	Mammograph Unit	1	To be used for early finding of breast cancer as a second screening diagnosis equipment	X-ray high voltage generator: 2.5kW or more, Operating ratings: Small focus: 10 to 200mAs,23kV to 35kV or more wide range, Large focus: 10 to 600mAs, 23kV to 35kV or more wide range, X-ray generator: Inverter type, X-ray tube unit: Focal spot: 0.1 mm/0.3 mm, Heat capacity: 150kHU or more, C-arm movement: Rotation: +180° to -135° or more wide rotation
38	Gynecology and Obstetrics	Gynecology and Obstetrics	Ultrasound for GY and OB	1	To be used for ultrasound diagnosis for Ob, Gy examination of prenatal process, abdominal organs and genital organs	Scanning methods: Electronic convex, Electronic linear, Observation monitor: B/W, CRT 12inch B/W or LCD 10.4inch or more big size, Probes: Convex, Linear, Trans-vaginal, Image memory:32 frames or more, Display modes: B, B/B, B/M, M Printer: B/W, Probe connector: 2 connectors or more
39			Colposcope	1	To diagnose disorder of cervix uterus and erosion	Main unit: Binocular type colposcope, Balance-arms type, Eyepiece: More than 10X, Objective: f = 300mm, Camera: 35mm analog or digital camera with memory media, Light source unit, Halogen lamp 100W or more, Filter: Equipped with green or other contrast filter
40			Fetal Doppler	3	To monitor the condition of fetus during delivery	Ultrasonic frequency: 2.5 MHz, FHR measurement range: 50 to 200 bpm or more wide range, Audible output: within 0.5 to 1.0 W, Ultrasonic output: Less than 10 mW/cm2, Power requirement: AC/DC rechargeable battery
41	Infective Diseases	Infective Diseases	Mobile X-ray Unit	1	To take X-ray images at wards and operation rooms and ICU	X-ray Generator:15 kW or more, kV range:40 kV to 130 kV or more wide range, mAs range: 0.5 mAs to 200 mAs or more wide range
42			Patient Monitor	2	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2,NIBP and temperature parameters.	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
43			Suction Unit	2	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
44	Emergency Department	Emergency Department	Suction Unit	1	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
45			Electrosurgical Unit	1	To cut and coagulate with high frequency current electricity	Type :Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more
46			Operating Table	1	To be used for various Ob, Gy operations such as caesarian operation etc.	Main unit operation: Electric hydraulic operation, Table top Dimensions: 1,900 x 490 mm or more, Elevation range: 730 mm to 1,000 mm or more wide range, Trendelenburg: 25° or more, Reverse trendelenburg: 25° or more, Back section: 60° up or more, 40° down or more
47			Mobile Operation Light	1	Mobile operation light with battery for surgical operations	Light source: Halogen bulb, Light intensity: 80,000 lux or more, Battery operation time: 2 hours or more
48			Hot Air Sterilizer	1	To be used for quick sterilization for small medical instruments	Effective capacity: within 90 to 120 L, Interior finish: Stainless steel, Temperature: Maximum 200°C or more, Heating system: Forced air or natural, Temperature control system: Microcomputer PID system
49			Anesthesia Unit	1	To anesthetize patient for surgical operations	Composition: Anesthesia unit, Ventilator, Vaporizer, Gas Cylinder Anesthesia main unit: Flow meter unit: O2, N2O, AIR, Vaporizer: Isoflurane, Ventilator: Equipment should be built - in /or fixed on Anesthesia unit cart, Type: Integrated electronically controlled, Tidal volume: 100 to 1,200 ml or more wide range
50	Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range:SpO2: 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided		
51	Neurology	Neurology	Patient Monitor	5	To monitor the condition of seriously ill patient by using respiration, ECG, Spo2, NIBP and temperature parameters.	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
52			EEG	1	To measure functional conditions of central nervous system accompany with epilepsy and brain tumor	Number of channel: 32 signal or more, Sensitivity: 1 to 200µV/mm, Data storage device: Hard disk drive and MO, CD-R or DVD-R, Color display unit: Provided

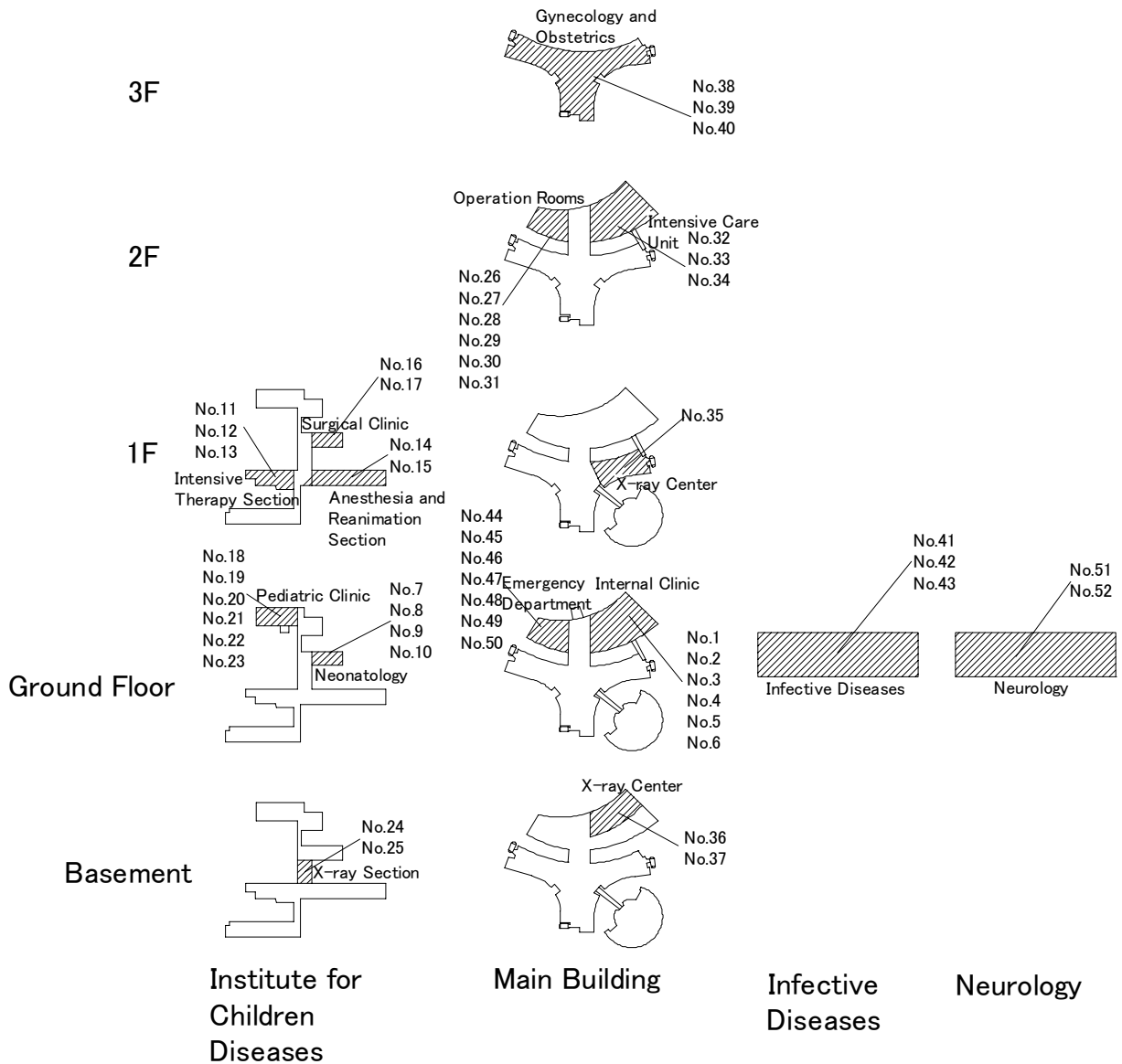
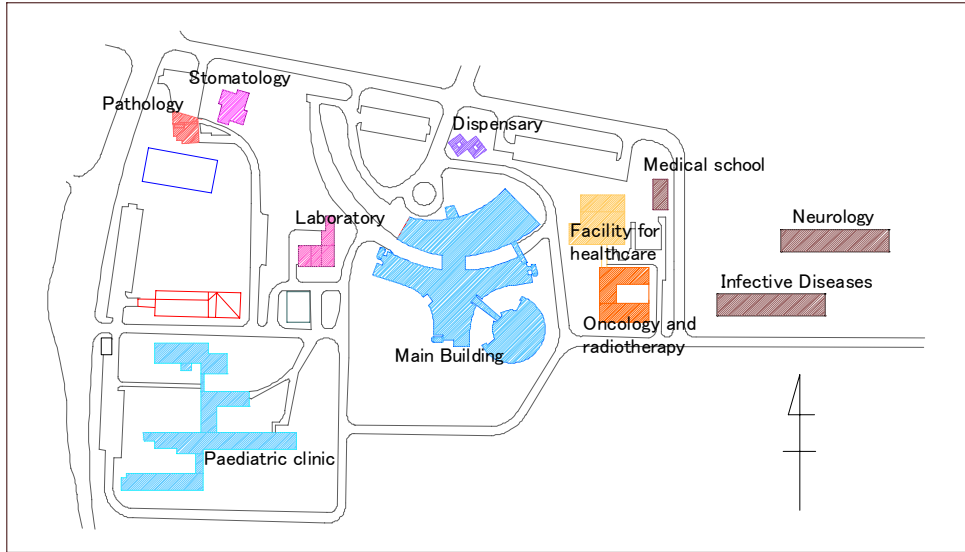


Figure 1 Equipment Plan for Clinical Center of Montenegro in Podgorica

Table 6 Equipment List for General Hospital Niksic

No.	Department	Equipment	Qty.	Intended Use	Basic Specification and Notes
1	Surgical Clinic	Anesthesia Unit with Monitor	1	To anesthetize patient for surgical operations	Composition: Anesthesia unit, Ventilator, Vaporizer, Gas Cylinder, Monitor Anesthesia main unit: Flow meter unit: O2, N2O, AIR, Vaporizer: Isoflurane, Ventilator: Equipment should be built – in /or fixed on Anesthesia unit cart, Type: Integrated electronically controlled, Tidal volume: 100 to 1,200 ml or more wide range Monitor : Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
2		Hot Air Sterilizer	2	To be used for quick sterilization for small medical instruments	Effective capacity: within 90 to 120 L, Interior finish: Stainless steel, Temperature: Maximum 200°C or more, Heating system: Forced air or natural, Temperature control system: Microcomputer PID system
3		Suction Unit	4	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
4		Electrosurgical Unit	3	To cut and coagulate with high frequency current electricity	Type :Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more
5		Mobile Operation Light	1	Mobile operation light with battery for surgical operations	Light source: Halogen bulb, Light intensity: 80,000 lux or more, Battery operation time: 2 hours or more
6		Operation Microscope	1	To be used for microsurgery	Type: Straight binocular tube/Balance arm type, Objective: F=175 to 250mm, Light source: Halogen lamp, 75W or more
7	Gynecology and Obstetrics Department	Ultrasound for GY and OB	1	To be used for ultrasound diagnosis for Ob, Gy examination of prenatal process, abdominal organs and genital organs	Scanning methods: Electronic convex, Electronic linear, Observation monitor: B/W, CRT 12inch B/W or LCD 10.4inch or more big size, Probes: Convex, Linear, Trans-vaginal, Image memory:32 frames or more, Display modes: B, B/B, B/M, M Printer: B/W, Probe connector: 2 connectors or more
8		Patient Monitor	1	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2, NIBP and temperature parameters	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
9		Colposcope	1	To diagnose disorder of cervix uterus and erosion	Main unit: Binocular type colposcope, Balance-arms type, Eyepiece: More than 10X, Objective: f = 300mm, Camera: 35mm analog or digital camera with memory media, Light source unit, Halogen lamp 100W or more, Filter: Equipped with green or other contrast filter
10		Vacuum Extractor	1	To be used for vacuum delivery	Suction pressure range: 0 to 650 mmHg or more wide range, Suction bottles: 2pcs. Total volume 4,000cc or more, Pump: Rotary type or Piston type
11		Infant Incubator	1	To care for low weight and immature neonate	Control: Servo and manual control, Air temp. range: +25 to 37°C or more wide range, Skin temp. control range: +35 to 37.5°C or more wide range, Alarms: Provided
12		Fetal Doppler	3	To monitor the condition of fetus during delivery	Ultrasonic frequency: 2.5 MHz, FHR measurement range: 50 to 200 bpm or more wide range, Audible output: within 0.5 to 1.0 W, Ultrasonic output: Less than 10 mW/cm2, Power requirement: AC/DC rechargeable battery
13		ECG	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standard 12 leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz (within-3db), Display Type: 3 channel display or more
14		Syringe Infusion Pump	3	To be used for strictly controlled doses of medication to patients	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
15		Infant Warmer	3	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
16		Bilirubin Checker	1	To be used for diagnosis for jaundice of neonate	Measuring range: 0 to 20.0µmol/L or more wide range, Measuring method: Non-Invasive Analyze, Power requirement: Rechargeable Battery / AC adapter or 3AA Batteries
17	Phototherapy Unit	1	To be used for treating for jaundice of neonate	Phototherapeutic lamps: 5 pcs. or more of 20W. Blue lamp, Irradiation angle change: Adjustable	
18	Internal Department (with Coronary Unit)	ECG	2	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standard 12 leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz (within-3db), Display Type: 3 channel display or more
19		Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range: SpO2: 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided
20		Suction Unit	2	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
21		Syringe Infusion Pump	5	To be used for strictly controlled doses of medication to patients	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
22		Blood Gas Analyzer	1	Tests for emergent resuscitation tests by directly measuring arterial oxygen saturation (SaO2) bicarbonate (HCO3-)	Measured parameter: pH, pCO2, pO2, Barometric Pressure Sample volume: Less than 100µl

23	Emergency Section	Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range:SpO2: 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided
24		Suction Unit	1	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
25		Defibrillator	1	To be Used for cardiopulmonary resuscitation in emergencies by using a countershock for restoring breathing rhythm in times of ventricular fibrillation, flutter, ventricular tachycardia	Output energy: Max. 200J or more, Alarm function: Provided, Monitor: Display: ECG, Power source: AC220V/ 50Hz and Rechargeable battery
26		Electrosurgical Unit	1	To cut and coagulate with high frequency current electricity	Type: Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more
27		Mobile Operation Light	1	Mobile operation light with battery for surgical operations	Light source: Halogen bulb, Light intensity: 80,000 lux or more, Battery operation time: 2 hours or more
28	Intensive Care Unit	Syringe Infusion Pump	5	To be used for strictly controlled doses of medication to patients	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
29		Suction Unit	4	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
30		Blood Gas Analyzer	1	Tests for emergent resuscitation tests by directly measuring arterial oxygen saturation (SaO2) bicarbonate (HCO3-).	Measured parameter: pH, pCO2, pO2, Barometric Pressure, Sample volume: Less than 100µl
31		Patient Monitor	4	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2, NIBP and temperature parameters.	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
32		Ventilator	1	To be used for mechanical artificial breathing	Oxygen concentration: 21 to 99% or more wide range, Tidal volume: 100 to 1,300 ml or more wide range, PEEP: 0 to 20 cmH2O or more range, Breathing frequency: 8 to 40 times/min. or more range, Alarms: Air pressure and apnea
33	Surgery Department	Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range:SpO2: 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided
34		ECG	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standad12leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db) , Display Type: 3 channel display or more
35	Endoscopy Room	Gastrobioscope	2	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of esophagus and gaster	Field of view: 100° or more, Depth of Field: 3 to 100 mm or more, Distal end outer diameter: Withinφ9.5 to 9.8 mm, Working length: 1,030 mm or more
36		Colonofiberscope	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of large intestine	Fields of View: 120° or more, Depth of Field: 5 to 100mm or more, Distal end outer diameter: Withinφ12.6 to 13.8mm, Working length: 1,660mm or more
37		Laryngofiberscope	1	To be used for intranasal endoscopy examination	Field of view: 75° or more, Depth of Field: 5 to 50 mm or more, Distal end outer diameter: Withinφ3.3 to 4.2 mm, Working length: 300 mm or more
38		Fiberscope System (Suction, Coagulator, Lightsource, Washing Unit)	1	To procure necessary accessories for use of fiberscopes. It is composed of Suction, Coagulator, lightsource and washing unit for preventing infectious disease	Composition: Suction Pump, Coagulator, Lightsource, Washing unit, Lightsource: Halogen 150W or more, or Xenon 75W or more, Suction Pump: Pressure: -80kPa or more, Bottle capacity: 1.4L or more, Coagulator: Type: Monopolar & bipolar, Cutting:200W or more, Coagulation:120W or more, Bipolar:120W or more, Washing Method: Washing with electrolyzed acid water or Washing with detergent and water sterilized by Ultraviolet Ray or Washing with detergent and water, and alcohol flushing
39	Pediatric Department	Nebulizer	2	To be used for humidified treatment	Nebulizing timer: 1 to 30 min. or more, Nebulizing rate: 3 ml/min. or more
40		Syringe Infusion Pump	2	To be used for strictly controlled doses of medication to patients	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
41		Patient Monitor for Pediatric	1	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2,NIBP and temperature parameters	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
42		Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range: SpO2: 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided
43		Infant Ventilator	1	To be used for mechanical artificial breathing for neonate	Oxygen concentration: 21 to 99% or more wide range, Flow: 3 to 30 L/min or more wide range, Inspiratory time: 0.1 to 2.0 sec or more wide range, Breathing frequency: 5 to 150bpm or more wide range, Alarms: Air pressure and apnea Compressor: Equipment should be built-in /or fixed on ventilator main unit cart
44	X-ray Department	Mobile X-ray Unit	1	To take X-ray images at wards and operation rooms and ICU	X-ray Generator:15 kW or more, kV range: 40 kV to 130 kV or more wide range, mAs range: 0.5 mAs to 200 mAs or more wide range

45	X-ray Department	Color Doppler (4 probes)	2	To be used for various ultrasound diagnosis such as diagnosis of abdominal organs, surface, cerebral diagnosis for infant and cardiovascular, by using color display	Scanning Methods: Electronic convex, Electronic linear, Electric Phased Array Sector, Beam former: Digital, Monitor: 15-inch color monitor or large size, Probe: Convex, Linear, Sector, Trans-rectal, Micro-convex, Imaging Mode: B, M, D (PWD, CWD), Printer: Color, Probe selector: 3 connectors or more
46		Mobile C-arm X-ray Unit	1	To take X-ray images during surgical operation and bone setting etc.	X-ray Generator: 1.5kW or more, Radiographic kV range: 40 to 110kV or more wide range, Radiographic mAs range: 13 to 20mA or more wide range, Fluoroscopic kV range: 50 to 125kV or more wide range, Mode: Continuous, Pulse, X-ray Generator: Type: Inverter type, Image Intensifier: 9 inch, X-ray tube Anode heat: 40kHU or more, TV Monitor: 17inch or more CRT
47		Mammograph Unit	1	To be used for early finding of breast cancer as a second screening diagnosis equipment	X-ray high voltage generator: 2.5kW or more, Operating ratings: Small focus: 10 to 200mAs, 23kV to 35kV or more wide range, Large focus: 10 to 600mAs, 23kV to 35kV or more wide range, X-ray generator: Inverter type, X-ray tube unit: Focal spot: 0.1 mm/0.3 mm, Heat capacity: 150kHU or more, C-arm movement: Rotation: +180° to -135° or more wide rotation
48	Neurology Department	Patient Monitor	2	To monitor the condition of seriously ill patient by using respiration, ECG, SpO2, NIBP and temperature parameters	Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
49		Suction Unit	2	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
50		ECG	1	To observe cardiograph during irregular pulse and myocardial ischemia	Leads: Standard 12 leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz (within-3db), Display Type: 3 channel display or more
51		Syringe Infusion Pump	2	To be used for strictly controlled doses of medication to patients	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
52	Blood Transfusion Section	Centrifuge	1	To separate components in blood and urine with centrifugal force	Maximum speed: 4,000 rpm or more, Maximum force: 2,600 x g or more, Speed control: Microprocessor control, Timer: Provided, Tube rack: 15 ml x 24 pcs. or more
53		Hematocrit Centrifuge	1	To separate components in blood with centrifugal force	Maximum speed: 12,000 rpm or more, Maximum force: 15,000 x g or more, Speed control: Microprocessor control, Timer: Provided
54	Laboratory	Coagulometer	1	To diagnose blood coagulation	Analysis parameters: PT, aPTT, TT, Fibrinogen and/or more parameters, Detector: 2 channels or more, Incubation: 37°C within ± 0.5°C, Printer: Provided
55		Electrolyte Analyzer	1	To measure Na+, K+ and Cl- in serum for resuscitation diagnosis	Parameter: Na+, K+, Cl-, Sample type: Whole blood, serum, plasma, urine, Analysis time: Within 60 seconds, Printer: Built-in
56	Urology	Endoscope System for Urology	1	To be used for urological laparoendoscopic surgery such as cholelithotomy and prostatomegaly etc.	Composition: Telescopes, Light source, Electro-surgical unit, Suction unit, Monitor system, Forceps etc., Telescope: Cysto-Urethroscope: 4mm, 0° or 30°, 4mm 70°, Optical Ureterotome: 4mm, 0° or 12°, Resectoscope: 4mm, 30°, Light source: Xenon, Electro-surgical unit: High frequency type, Monopolar/Bipolar, Suction unit: Suction/Irrigation, Monitor system: PAL system, Video system: PAL, VHS or DVD, TV Monitor: PAL system, Monitor: Color, 19 inch or more, Main composition of accessories: Trocar, Grasping forceps, Scissor, High Frequency Cable, Probe, High Frequency Cable, Trolley
57	Sterilization	Vertical Steam Sterilizer	2	To be used for sterilization for small medical instruments in various kinds	Chamber capacity: More than 75L, Use for: Pressure steam sterilizing for medical equipment and linen, Chamber: Stainless steel, Sterilizing temperature: 110 to 127°C or more wide range, Timer: 1 to 60min. or more
58	Surgical Treatment Instrument	General Surgical Instrument Set	2	Instruments for general surgery	Composition: Operating knife, Operating Scissor, Hemostatic forceps, Needle set, Sterilizing case, etc., Total 68 Compositions
59		Caesarean Instrument Set	1	Instruments for obstetric surgery such as a caesarian operation etc.	Composition: Operating forceps, hemostatic forceps, Mikulicz peritoneal forceps, Scissors, Sterilizable case, etc., Total 33 compositions

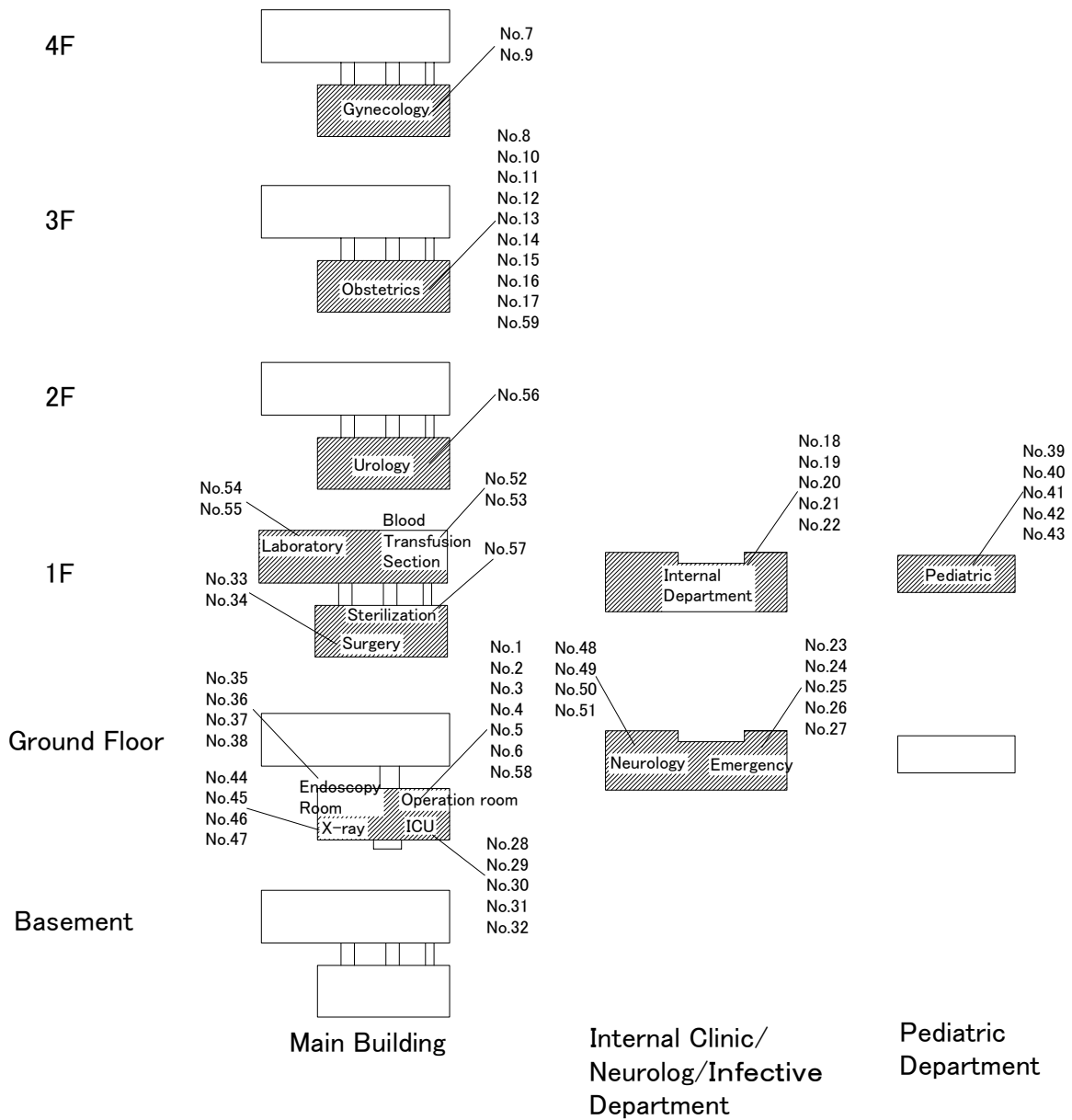
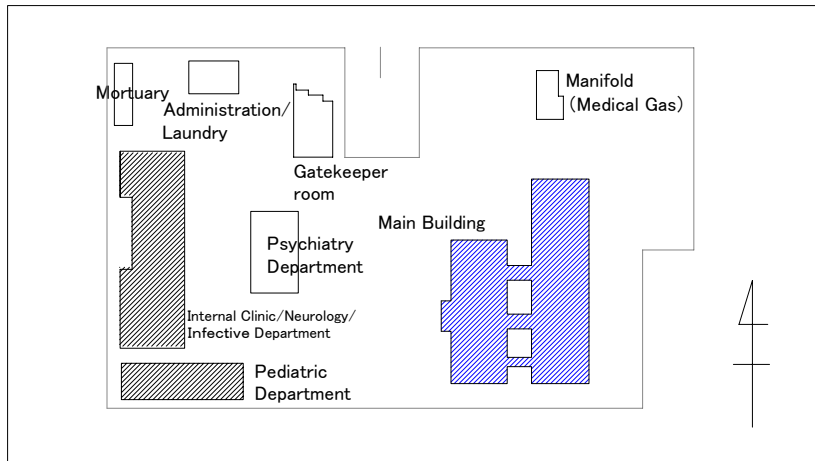


Figure 2 Equipment Plan for General Hospital Niksic

Table 7 Equipment List for General Hospital Kotor

No.	Department	Equipment	Qty.	Intended Use	Basic Specification and Notes
1	Surgery Section (Two Operating Rooms)	Electrosurgical Unit	2	To cut and coagulate with high frequency current electricity	Type: Monopolar/ bipolar, Monopolar: Cutting: Output 250W or more, Coagulation: Output 120W or more, Bipolar: Output 18W or more
2		Suction Unit	2	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
3		Anesthesia Unit with Monitor	1	To anesthetize patient for surgical operations	Composition: Anesthesia unit, Ventilator, Vaporizer, Gas Cylinder, Monitor Anesthesia main unit: Flow meter unit: O2, N2O, AIR, Vaporizer: Isoflurane, Ventilator: Equipment should be built – in /or fixed on Anesthesia unit cart, Type: Integrated electronically controlled, Tidal volume: 100 to 1,200 ml or more wide range Monitor : Measured parameters: ECG/HR/Resp./SpO2/Temp./NIBP, Display: LCD (Color), ECG channels: 3 or more, Respiration Measuring range: 4 to 60 bpm or more wide range, SpO2 Measuring range: 40 to 100% or more wide range, Temperature Measuring range: 20 to 45°C or more wide range, NIBP Measurement range: 25 to 260 mmHg or more wide range, Printer: Provided
4		Laparoscope and Urologicalscope Surgical System	1	To be used for abdominal and urological laparoendoscopic surgery such as cholelithotomy and prostatomegaly etc.	Composition: Telescopes, Insufflations Unit, Light source, Electro-surgical unit, Suction unit, Monitor system, Forceps etc. Telescope: Laparoscope: 10mm, 0°, 10mm, 25° or 30° Cysto-Urethroscope: 4mm, 0° or 30°, 4mm 70° Optical Ureterotome: 4mm, 0° or 12°, Resectoscope: 4mm, 30°, Insufflations Unit: CO2 Gas, Light source: Xenon, Electro-surgical unit: High frequency type, Monopolar/Bipolar, Suction unit: Suction/Irrigation, Monitor system: PAL system, Video system : PAL, VHS or DVD, TV Monitor: PAL system, Monitor: Color, 19 inch or more Main composition of accessories: Trocar, Grasping forceps, Scissor, High Frequency Cable, Probe, High Frequency Cable, Trolley
5		General Surgical Instrument Set	2	Instruments for general surgery	Composition: Operating knife, Operating Scissor, Hemostatic forceps, Needle set, Sterilizing case, etc., Total 68 Compositions
6		Operation Lamp	1	Operation light for surgical operations	Ceiling type, Halogen light Light intensity: Main Max. 110,000 lux or more, Sub Max. 95,000 lux or more, Focus control: Provided
7	ICU	Ventilator	1	To be used for mechanical artificial breathing	Oxygen concentration: 21 to 99% or more wide range, Tidal volume: 100 to 1,300 ml or more wide range, PEEP: 0 to 20 cmH2O or more range, Breathing frequency: 8 to 40 times/min. or more range, Alarms: Air pressure and apnea
8		Syringe Infusion Pump	4	To be used for strictly controlled doses of medication to serious diseases patients.	Flow rate range: 0.1 to 99.9 mL / hr. or more wide range, Flow rate accuracy: within ± 3% with syringe involved, Syringe: Usable more than 2 kinds syringe in 10 to 50 ml capacity, Alarms: Provided
9	ORL (ENT)	Examination Light	1	Lamp for various diagnosis	Light source: Halogen bulb, Light intensity: Max. 34,000 lux or more at 80cm, Stand: Provided
10		Hot Air Sterilizer	1	To be used for quick sterilization for small medical instruments	Effective capacity: within 90 to 120 L, Interior finish: Stainless steel, Temperature: Maximum 200°C or more, Heating system: Forced air or natural, Temperature control system: Microcomputer PID system
11		Suction Unit	1	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
12	Internal Medicine with Coronary Care Unit	ECG	2	To observe cardiograph during irregular pulse and myocardial ischemia diagnosis	Leads: Standard 12 leads, Sensitivity: 5, 10, 20mm/mV, Frequency response: 0.05-150Hz(within-3db), Display Type: 3 channel display or more
13		Defibrillator	1	To be used for cardiopulmonary resuscitation in emergencies by using a countershock for restoring breathing rhythm in times of ventricular fibrillation, flutter, ventricular tachycardia	Output energy: Max. 200J or more, Alarm function: Provided, Monitor: Display: ECG, Power source: AC220V/ 50Hz and Rechargeable battery
14		Holter System of ECG	1	To observe cardiograph for many hours by using mobile recoding system for irregular pulse, cardiac infarction, myocardial ischemia and pericarditis	Composition: Main ECG unit with software, Holter ECG Recorder 3unit, Printer ECG display waveform: 3 channel display or more, Recording media: IC memory card, Continuous recording time: Maximum 24 hours or more
15		Treadmill system	1	To analyze cardiograph by observing successive cardio potential with using treadmill	Composition: ECG main unit, Treadmill , Printer ECG Display waveform: 3 channel display or more, Treadmill: Speed range: 0 to 18.0 km/h or more
16	Endoscope Room	Gastrofiberscope	1	To be used for endoscopy examination for inflammation, ulceration of esophagus and gaster	Field of view: 100° or more, Depth of field: 3 to 100 mm, Distal end outer diameter: Withinφ9.5 to 9.8 mm, Working length: 1,030 mm
17		Colonofiberscope	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of large intestine	Fields of View: 140° or more, Depth of Field: 5 to 100mm, Distal end outer diameter: φ13.8mm, Working length: 1,680 mm
18		Sigmoidoscope	1	To be used for endoscopy examination for inflammation, ulceration, cancer and polyp of sigmoid colon	Field of view: 120°, Depth of Field: 5 to 100 mm, Distal end outer diameterφ12.2 mm, Working length: 1,680 mm
19	Gynecology and Obstetric	Gynecological Examination Table	3	To diagnose and treat gynecological patient	Operation: Manual hydraulic elevation by foot pedal, Elevation range: 650mm to 900mm or more wide range, Back tilt angle: 30° up or more
20		Suction Unit	3	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type
21		Examination Light	2	Lamp for various diagnosis	Light source: Halogen bulb, Light intensity: Max. 34,000 lux or more at 80cm, Stand: Provided
22		Colposcope	1	To diagnose disorder of cervix uterus and erosion	Main unit: Binocular type colposcope, Balance-arms type, Eyepiece: More than 10X, Objective: f = 300mm, Camera: 35mm analog or digital camera with memory media, Light source unit, Halogen lamp 100W or more, Filter: Equipped with green or other contrast filter

23	Gynecology and Obstetric	Hot Air Sterilizer	1	To be used for quick sterilization for small medical instruments	Effective capacity: within 90 to 120 L, Interior finish: Stainless steel, Temperature: Maximum 200°C or more, Heating system: Forced air or natural, Temperature control system: Microcomputer PID system
24		Delivery Table	1	To be used for delivery	Main unit Elevation mechanism: Hydraulic oil pump system, Dimensions: Main table: 1,150(L) x 550(W) mm or more, Inclination of table: ±10 degree or more, Height adjustment: 650 to 930 mm or more by foot-pedal
25		Fetal Doppler	2	To monitor the condition of fetus during delivery	Ultrasonic frequency: 2.5 MHz, FHR measurement range: 50 to 200 bpm or more wide range, Audible output: within 0.5 to 1.0 W, Ultrasonic output: Less than 10 mW/cm ² , Power requirement: AC/DC rechargeable battery
26		Infant Warmer	2	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
27	Children Ward	Phototherapy Unit	1	To be used for treating for jaundice of neonate	Phototherapeutic lamps: 5 pcs. or more of 20W. Blue lamp, Irradiation angle change: Adjustable
28		Infant Warmer	1	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
29		Laryngoscope Set	1	To observe and treat for guttural part	Composition: kinds Macintosh Blade in size No. 0 to No. 4 1 pc. Each, Handle with lightsource 1pc.
30		Pulse Oximeter	1	To be used for the percutaneous resuscitation test	Measuring range: SpO ₂ : 1 to 99% or more, Pulse rate: 30 to 240 bpm or more wide rate, Alarm: Provided
31		Nebulizer	1	To be used for humidified treatment	Nebulizing timer: 1 to 30 min. or more, Nebulizing rate: 3 ml/min. or more
32		Suction Unit (Low Pressure Type)	1	To suck blood, and other secretion liquid during delivery	Suction pressure range: 0 to 200 mmHg or more wide range, Suction bottle: 1 pc./within 1,000 to 3,000cc, Pump: Diaphragm type or Magnetic type
33	Infant Box	Infant Warmer	1	To care for neonate	Control: Servo and manual control, Skin temp. control range: +35 to 37°C or more wide range, Gas cylinder/Gas regulator: Provided, Suction device: Provided, Alarms: Provided
34		Digital Infant Scale	1	To measure the weight of neonate	Weight capacity: Up to 10kg or more, Display: Digital, Weight sensitivity: Less than 50g up to 10kg
35		Suction Unit (Low Pressure Type)	1	To suck blood, and other secretion liquid during delivery	Suction pressure range: 0 to 200 mmHg or more wide range, Suction bottle: 1 pc./within 1,000 to 3,000cc, Pump: Diaphragm type or Magnetic type
36		Phototherapy Unit	1	To be used for treating for jaundice of neonate	Phototherapeutic lamps: 5 pcs. or more of 20W. Blue lamp, Irradiation angle change: Adjustable
37	Biochemical Laboratory	Blood Cell Counter	1	To measure red and white blood cells and hemoglobin in blood	Parameters: 18 parameters or more, (including WBC, RBC, Hgb, MCV, Hct, MCHC, RDW, PLT, PDW, MPV) Throughput: 50 sample tests/hour or more, Printer: Provided, Sample volume: 50 µl or less of whole blood mode
38		Coagulometer	1	To diagnose brood coagulation	Analysis parameters: PT, aPTT, TT, Fibrinogen and/or more parameters, Detector: 2 channels or more, Incubation: 37°C within ±0.5°C, Printer: Provided
39		Microscope	1	To diagnose microbism or anemia by observing specimen	Eyeiece tube: Binocular tube, Eyeiece lens: 10X, Objective lens: 4 or 5X, 10X, 40X, 100X and/or more lens, Illumination system: Halogen Lamp
40		Digital Analytical Scale	1	To be used for accurate measure for reagent and specimen	Capacity: 200g or more, Readability: 0.01g or less
41	Radiology	Fluoroscopy Unit	1	To take X-ray images by observing fluoroscopic image on monitor with using contrast medium for internal organs	Composition: Remote control diagnostic table, X-ray generator, X-ray tube, TV monitor X-ray generator: Nominal power output: 50kW or more, Fluoroscopic function: kV range: 50 to 125kV or more wide range, mA range: 0.5 to 4.0mA or more wide range, X-ray generator: Inverter type, X-ray tube unit: Anode heat capacity: 300kHU or more, X-ray TV camera: CCD, TV monitor: 15 inch CRT or more big size, Diagnostic table: Tilting range: 90° (vertical) to -25° (head-down) or more wide range, Cassette holder: 11 x 14inch, 14 x 14inch
42		General X-ray Unit	1	To be used for diagnosis of chest, joints and fracture by taking X-ray images of patients fixed on a table or a hieder stand	Composition: X-ray generator, X-ray tube, X-ray tube support, Floating top bucky table, Bucky stand, X-ray Generator: 50kW or more, kV range: 40 to 150kV or more wide range, mAs range: 10 to 500mA or more wide range, X-ray generator: Inverter type, X-ray Tube heat capacity: 300kHU or more, X-ray Tube Support Unit: Type: Floor support, Bucky Table: Floating-top Bucky Table
43		Mobile C-arm X-ray Unit	1	To take X-ray images during surgical operation and bone setting etc.	X-ray Generator: 1.5kW or more, Radiographic kV range: 40 to 110kV or more wide range, Radiographic mAs range: 13 to 20mA or more wide range, Fluoroscopic kV range: 50 to 125kV or more wide range, Mode: Continuous, Pulse, X-ray Generator: Type: Inverter type, Image Intensifier: 9 inch, X-ray tube Anode heat: 40kHU or more, TV Monitor: 17inch or more CRT
44		Color Doppler (5 probes)	1	To be used for various ultrasound diagnosis such as diagnosis of abdominal organs, surface, cerebral diagnosis for infant and cardiovascular, by using color display	Scanning Methods: Electronic convex, Electronic linear, Electric Phased Array Sector, Beam former: Digital, Monitor: 15-inch color monitor or large size, Probe: Convex, Linear, Sector, Trans-rectal, Micro-convex, Imaging Mode: B, M, D (PWD, CWD), Printer: Color, Probe selector: 3 connectors or more
45	Transfusion	Hot Air Sterilizer	1	To be used for quick sterilization for small medical instruments	Effective capacity: within 90 to 120 L, Interior finish: Stainless steel, Temperature: Maximum 200°C or more, Heating system: Forced air or natural, Temperature control system: Microcomputer PID system
46	Infection Disease Ward	Suction Unit	1	To suck blood, pus, washing liquid and other secretion liquid	Suction pressure range: 0 to 650mmHg, Suction bottle: 3,000cc x 2 pcs., Pump type: Rotary type or Piston type

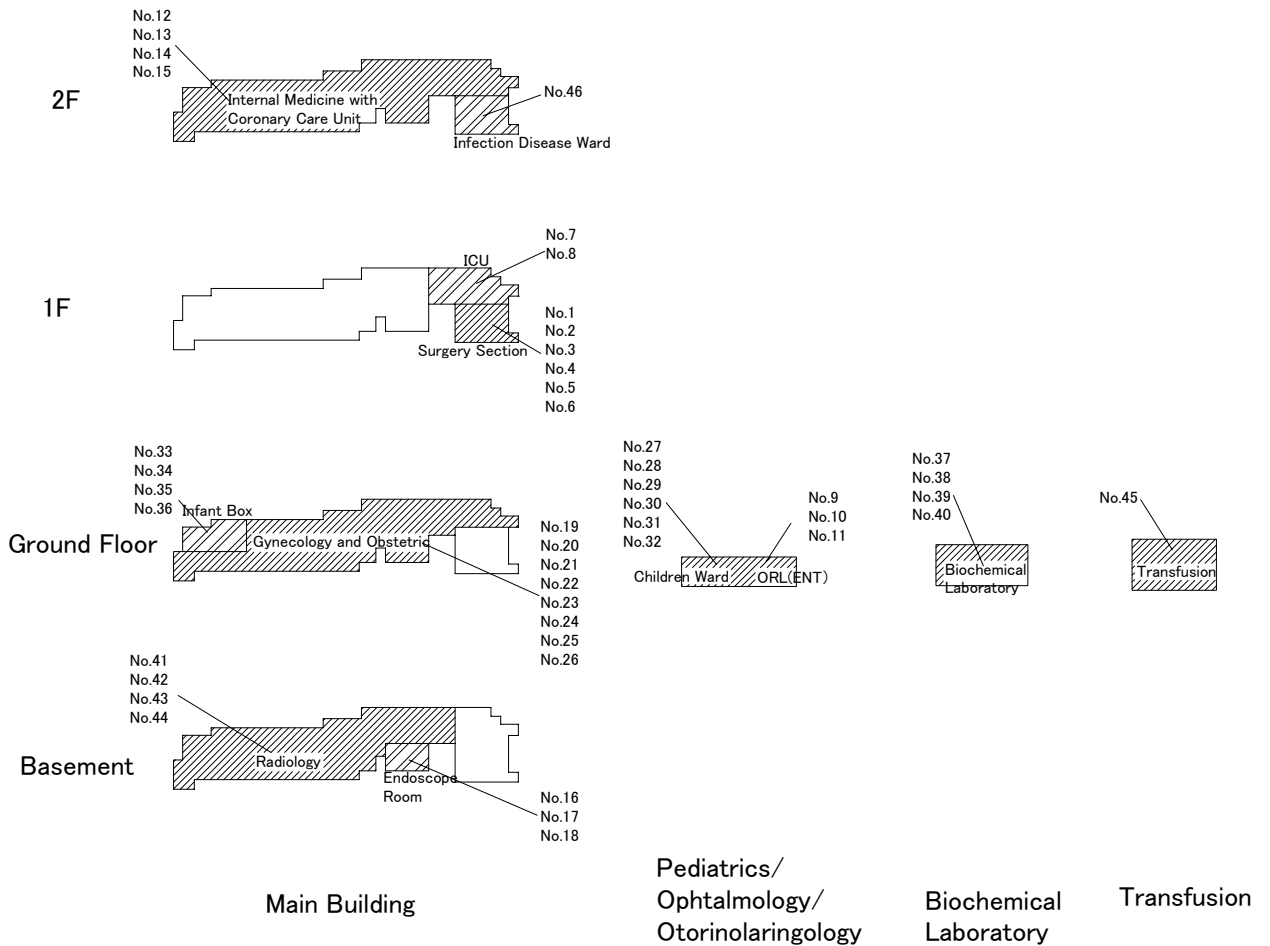
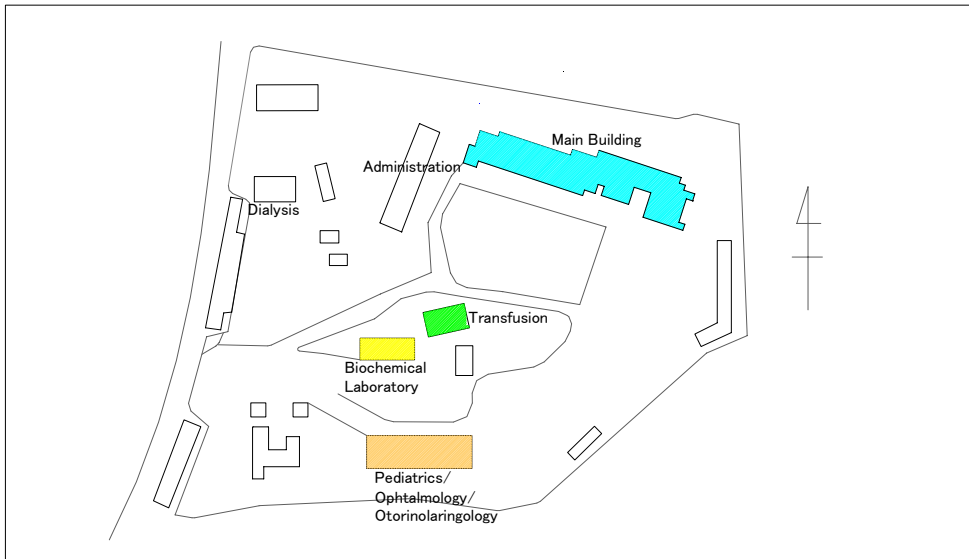


Figure 3 Equipment Plan for General Hospital Kotor

2-2-4 Implementation Plan

2-2-4-1 Implementation Policy

The Project will be carried out after the signing of the Exchange of Notes (E/N) by the two governments concerned in accordance with Japan's Grant Aid Scheme.

1. After the Notes are exchanged, the entire scope of the Project, from design, installation, and inspection to procurement, should be completed smoothly and promptly. Therefore, plans involving work and personnel should be formulated so that each stage of the Project can be executed efficiently and effectively.
2. To ensure smooth execution of the Project, a time and location should be arranged for representatives from the relevant organizations of the government of Montenegro such as the Ministry of Foreign Affairs, Ministry of Health and from the target hospitals to meet with staff from a Japanese consulting firm and supplier of the equipment, so as to discuss plans and other details.

After the Project is approved by the governments of both countries involved and the Exchange of Notes (E/N) is concluded, a Japanese consulting firm that is currently under contract with the Government of Montenegro will oversee the plan's execution as well as actual procurement of the equipment. Also, a supplier of the equipment will be determined on the basis of open tender as specified in the official notes, and this supplier will be responsible for procurement and installation of the equipment.

(1) Party Responsible for the Implementation of the Project

The responsible party in the Recipient Country is the Ministry of Health. The Ministry of Health will act as the contracting party of the Recipient Country, and shall be responsible for implementing the Project. The Ministry of Health is required to cooperate in regard to the appointment of the responsible persons concerned for the facility and work necessary for unpacking, delivery, and assembly / trial run of the equipment.

The Ministry of Health shall be responsible for customs clearance, internal transportation, and so forth.

(2) Consultant

Following the signing of the E/N between two governments concerned, the Ministry of Health shall sign a consultation agreement with a Japanese national consulting firm for the detailed design

of the equipment to be procured. The work will also be associated with tendering and supervision of the Project implementation. The agreement will be verified subject to approval by the Japanese Government. The consultant shall be responsible for implementation of the following work under the agreement.

1) Detailed Design Phase

The final confirmation of the Project, reviewing the equipment specifications, preparation of tender documents, supervision of tender procedure, and evaluation of the contents of the tender.

2) Implementation Phase

Supervision of the Project implementation including control of the work schedule, inspections of the equipment, supervision of transportation, supervision of installation work, and issuance of certificates.

(3) Suppliers of the Equipment

Based on the E/N and in accordance with the “Guidelines for Procurement” under Japan’s Grant Aid Scheme, the Ministry of Health shall sign a procurement agreement with Japanese national suppliers that shall be determined on the basis of open tenders on the equipment to be procured. The agreement shall be verified subject to the approval of the Japanese Government. The suppliers shall implement the following tasks under the agreement:

- Procurement, transport, and delivery of the equipment
- Installation of the equipment, and technical guidance concerning operation, maintenance, and repair

2-2-4-2 Implementation Conditions

To enable all aspects of the Project, procurement, transportation, instauration of the equipment, to be accomplished efficiently and in the shortest possible time, maintaining close communication with the suppliers is tantamount in order to ensure reliable progress supervision.

2-2-4-3 Scope of Works

The work procured for the Project by the Recipient Country and covered by Japan’s Grant Aid is described follows.

1) Work to be carried out by Montenegro

- Processing the procured equipment through customs in an appropriate and timely manner, and for the expenses involved
- Preparation of storage area for the equipment to be procured until the time of installation
- Removal of existing equipment necessary for installation among the procured equipment
- Connection of utilities such as electricity, water supply, drainage, etc. at the designated points for the equipment to be procured
- Preparation of the route for carrying the equipment to the room

2) Work to be covered by Japan's Grant Aid

- Procurement of the new medical equipment
- Transport of the procured equipment (Ocean freight and inland transportation) to three target hospitals, installation, and trial run of the procured equipment
- Technical transfer on operation and maintenance of the procured equipment

2-2-4-4 Consultant Supervision

A Japanese national consulting firm shall procure fair guidance, advice, and coordination throughout the detailed design phase and implementation phase of the Project. Furthermore, this consulting firm shall do whatever is necessary in order to ensure the smooth implementation of the Project in accordance with the Japan's Grant Aid Scheme and the Basic Design Study Report. The consultant will be deemed to have completed its work when the equipment is completely installed, it is confirmed that all conditions of the contract have been met, the official delivery of the equipment is witnessed, and the approval of the Recipient Country is obtained.

(1) Policy of Implementation Supervision

- Management of the completion dates for installation, maintaining close contact among all parties concerned
- Supervision of installation work
- Supervision of management and maintenance after the official delivery of equipment

(2) Personnel Plan

1) Detailed Design Phase

The consultants required for the supervision of detailed design shall be as follows:

•**Project Manager: One (1)**

Comprehensive supervision and direction of the consulting work.

•**Equipment Planner: One (1)**

Re-examination of the Project, confirmation of the equipment specification, preparation of tender documents and evaluation of the contents of the tender.

•**Cost Planner: One (1)**

Confirmation of the equipment specification, estimation of the Project costs, preparation of tender documents and evaluation of the contents of the tender.

2) Implementation Phase

The consultants required for the supervision of implementation shall be as follows:

•**Stationed Implementation Supervisor: One (1)**

Supervision of implementation at the Project sites.

•**Implementation Supervisor: One (1)**

Arrangement pre-confirmation with Montenegrin side, supervision of installation work, and issuance of certificates.

•**Inspection Engineer (drawing confirmation): One (1)**

Confirmation and verification of the drawing.

•**Inspection Engineer (pre-shipment inspection): One (1)**

Arrangement and contact for pre-shipment inspection.

2-2-4-5 Procurement Plan

(1) Important Factors in the Procurement of Equipment

The Project has focused on procuring basic equipment which does not need frequent maintenance, a high level of technical skill to maintain, or urgent measure for failure. However, it is important that spiral CT scanner requiring periodical service, laboratory equipment requiring a sustained supply of reagents and other equipment (such as ME related equipment, anesthesia units, ventilators etc.) needing repair services, consumable or spare parts should be procured from

companies with local agents within Montenegro or neighboring countries.

At present, there are very few local agents of equipment manufacturers based in Montenegro. Servicing of existing medical equipment is mainly provided from Belgrade in Serbia. The majority of the major European, US and Japanese manufacturers have local agents either in Belgrade or Zagreb (Croatia), allowing for the appropriate level of servicing to take place.

(2) Procurement from Third-party Countries

The dearth of local agents of medical equipment manufacturers based in Montenegro means that agents in Belgrade tend to cover the area. A large number of the major Japanese manufacturers have agents on the ground in Belgrade. However, not only are there limited agents for Japanese manufacturers in Belgrade, but also for European and US manufacturers of certain planned equipment. For equipment requiring regular maintenance, and/or a constant source of supplies or reagents, it will be necessary to look further afield at products with agents based anywhere from Serbia to the whole of former Yugoslavia.

(3) Inland Transport and Distribution

The transportation route of Japanese, European and US products is basically through Bar port, main port of Montenegro. The transportation routes including those to the Clinical Center in Podgorica and to the two target general hospitals are well maintained. There are no problems anticipated for the inland transportation of the equipment, and thus no special measures are deemed necessary. Only it is necessary to deal with inland transportation carefully in the winter time because of a freeze of roads in mountain areas.

(4) Plan of the Dispatching Engineers

Technicians will be dispatched from either Japan or the countries of manufacturers of the equipment in order to install the equipment. Other necessary staff for the installation will generally be sourced from local. In order to ensure sufficient transfer of skill to the doctors and other responsible persons at the target hospitals, a training process will be created for a suitable period of time, whereby representatives and doctors responsible for the equipment at each hospital will come together for courses offering guidance on operation and daily maintenance of the new equipment. It is therefore necessary to confer with the Ministry of Health before finalizing the skills transfer period etc.

Table 8 Engineer Dispatch Plan

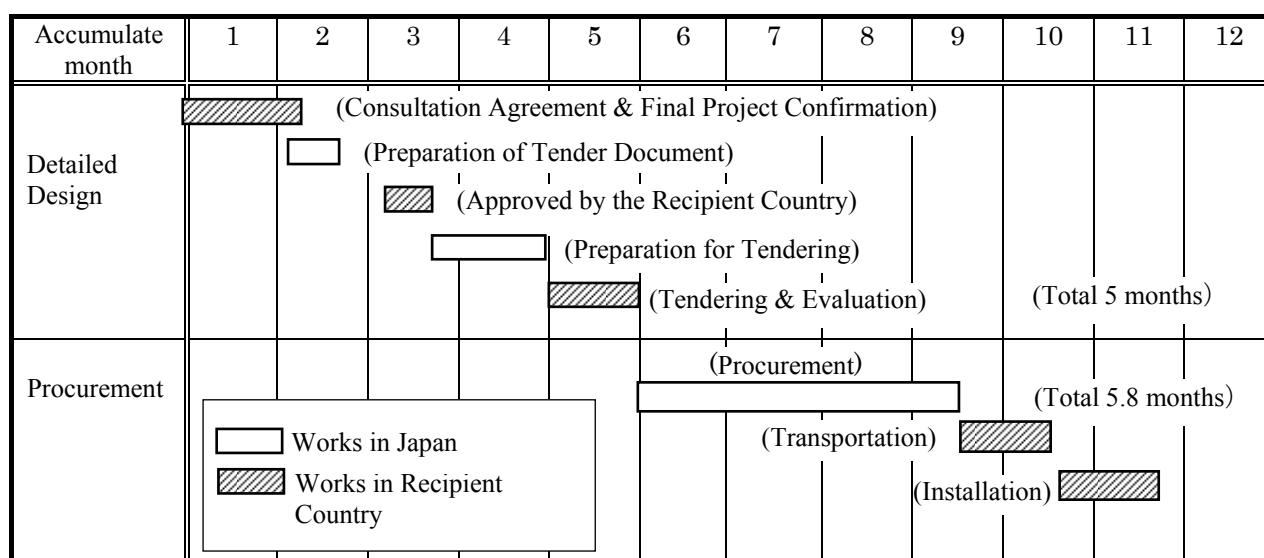
Engineer	Number	Days	Period (M/M)
Field Manager	1	30	1.00
X-ray Engineer (Engineer for CT scanner)	1	13	0.43
X-ray Engineer (Engineer for other X-ray equipment)	1	27	0.90
ME Equipment Engineer	1	23	0.77
Laboratory Equipment Engineer	1	12	0.40
Engineer for Other Medical Equipment	1	20	0.67

2-2-4-6 Implementation Schedule

When the time arrives for the Project to be carried out, the consulting firm will investigate the specifications of the equipment. Then, the supplier of the equipment, who will be decided through open tender, will procure the equipment.

The Project implementation schedule is given in **Table 9**.

Table 9 Project Implementation Schedule



2-3 Obligations of Recipient Country

The Recipient Country shall perform the following in accordance with the E/N, for the smooth implementation of the Project.

- To remove the existing equipment in all target hospitals (see **Table 17** Contents of Expense Borne by Montenegrin Side)
- To exempt customs duties, internal taxes, and other fiscal levies that may be imposed in the Recipient Country with respect to the supply of the equipment and the provision of services under the verified contracts

- To ensure both prompt customs clearance in the Recipient Country and a procedure for internal transportation therein of the medical equipment brought from Japan and third-party countries
- To provide Japanese nationals and engineers from third-party country working on the Project with every convenience to facilitate their entry into the Recipient Country and their stay therein
- To ensure the issuance of permits required by the laws of the Recipient Country for the implementation of the Project, and other permits, including tax exemptions
- To ensure that the equipment procured under the Grant Aid scheme should be maintained and used properly and effectively for the Project
- To confirm that the Recipient Country bears all expenses except for those agreed to be covered by the Japanese government

2-4 Project Operation Plan

2-4-1 Operation and Maintenance Plan

Most equipment to be procured for the Clinical Center by this Project is on the replacement of obsolescent equipment. Besides the equipment for the general hospitals is also basic model.

As regards the level of technical skills of the medical staff at the Clinical Center, since the hospital was both a central hospital for healthcare service and medical education in Yugoslavia era, many doctors have gained valuable work experience in modern medical facilities in Belgrade, Zagreb, Europe, the United States and Japan. On the other hand, since medical staffs of General Hospital Niksic and General Hospital Kotor also have a network with the staffs of the Clinical Center to exchange their skills. Moreover, accurate staffs are allocated in the each target hospital, it is concluded that there will be no barriers to the operation and maintenance of procured equipment.

Experienced medical staffs are allocated in the target hospitals for the endoscopic surgery that requires abundance operation experiences. In addition, regarding image diagnosis equipment such as spiral CT scanner etc., the appropriate maintenance system is already in place for the existing equipment at the target hospitals.

Where equipment requires frequent maintenance services or sustainable supply of consumable or spare parts, and for laboratory equipment requiring a constant supply of reagents, the Project aims to ensure speedy and cost effective supply of services by considering only those manufacturers supported by efficient agencies in Montenegro or neighboring countries.

2-4-2 Operation and Maintenance Cost

(1) Finance of Health Insurance Fund

The operation and maintenance budget for equipment supplied to the target hospitals through the Project will mainly come out of the HIF. In 2005, the HIF had revenues of 106 million Euro and expenditure to the sum of 105 million Euro. Since 2004, revenues have been on the increase thanks to the economic recovery. Cutbacks in spending are also contributing to the stable account balance of the HIF through measures including the introduction of a tender system for procurement of drugs and medical equipment, and appropriate drug prescriptions.

Table 10 Finance of Health Insurance Fund

Contents		Unit: EURO		
		2003	2004	2005
Revenue	Employed and Farmer	66,121,181	75,977,084	76,025,638
	Pension fund	23,901,771	16,916,355	20,674,839
	Unemployment insurance	2,701,845	1,724,669	5,695,452
	Others	1,682,570	1,784,321	4,051,513
Total		94,407,367	96,402,429	106,447,442
Expenditure	Payment for health service	89,181,152	87,519,418	97,419,073
	Public health service	2,745,643	2,626,398	2,521,476
	Others	4,643,059	5,435,045	5,390,654
Total		96,569,854	95,580,861	105,331,203
Balance		-2,162,487	821,568	1,116,239

Source: Health Insurance Fund

(2) Finance of Each Target Hospitals

The balance of accounts for each target hospital is shown in Tables 12-14. Revenues are on the increase at each of the hospitals, and even in cases where excess spending has put hospitals in deficit, the shortfall has been met by the HIF. Nevertheless, there is an ongoing drive to stabilize finances at these hospitals by means of labor cost cuts and centralization of hospital functions.

Table 11 Finance of the Clinical Center

Unit: EURO

Contents		2003	2004	2005
Revenue	Health Insurance Fund	20,465,955	22,983,003	24,364,596
	Patients	135,920	156,286	156,377
	Others	1,218,821	748,434	2,367,619
Total revenue		21,820,696	23,887,723	26,888,592
Expenditure	Personal cost	11,337,927	11,504,746	13,363,969
	Drug	3,035,726	3,687,318	4,576,928
	Equipment	3,164,759	3,347,942	4,275,504
	Consumable	311,639	302,243	277,563
	Operation and maintenance	903,093	896,752	863,716
	Lighting, heating and others	3,210,855	3,724,072	3,977,151
Total expenditure		21,963,999	23,463,073	27,334,831
Balance		-143,303	424,650	-446,239

Source: Basic Study Questionnaire

Table 12 Finance of General Hospital Niksic

Unit: EURO

Contents		2003	2004	2005
Revenue	Health Insurance Fund	3,226,570	2,990,943	3,199,021
	Patients	2,707	2,267	24,632
	Others	447,641	556,478	433,890
Total revenue		3,676,918	3,549,688	3,657,543
Expenditure	Personal cost	1,597,347	1,559,351	1,587,742
	Drug	484,112	371,716	633,547
	Equipment	36,356	172,560	453,347
	Consumable	334,268	335,121	321,315
	Operation and maintenance	46,432	75,263	81,510
	Lighting, heating and others	844,691	1,039,487	1,552,907
Total expenditure		1,643,359	1,698,609	1,797,746
Balance		-260,577	-367,431	-240,562

Source: Basic Study Questionnaire

Table 13 Finance of General Hospital Kotor

Unit: EURO

Contents		2003	2004	2005
Revenue	Health Insurance Fund	1,372,272	1,291,313	1,392,840
	Patients	10,510	18,711	26,841
	Others	n.a.	21,154	137,503
Total revenue		1,382,782	1,331,178	1,557,184
Expenditure	Personal cost	907,501	919,001	959,973
	Drug	218,364	222,567	223,124
	Equipment	20,548	36,746	252,218
	Consumable	13,769	15,257	23,104
	Operation and maintenance	27,871	29,670	22,512
	Lighting, heating and others	455,306	475,368	316,815
Total expenditure		3,343,206	3,553,498	4,630,368
Balance		333,712	-3,810	-972,825

Source: Basic Study Questionnaire

(3) Operation and Maintenance Costs for Procurement of Equipment

The purchase of consumable, regular servicing and maintenance and fuel account for much of the operation and maintenance cost of newly procured equipment. However, with regard to the spiral CT scanner for the Clinical Center (with the highest operation and maintenance costs in the Project) new procurement involves the replacement of existing equipment for which blanket maintenance contracts are already in place, hence in this instance, no additional expenses will be incurred. Elsewhere also, much existing equipment is to be replaced, reducing running and maintenance costs as a result. Consequently, the only extra operation and maintenance costs likely to arise due to the Project are in the purchase of necessary consumable items for new equipment such as electrodes for examination apparatus, printer paper and bulbs for light sources.

Table 14 gives estimates of operation and maintenance expenses for the planned equipment and expenses for each target hospital.

Table 14 Estimates of Operation and Maintenance Expenses for the Planned Equipment and Expenses for Each Target Hospital

Unit: EURO

Target Hospitals	Equipment	Remarks and Estimate Base	Unit Cost/Year	Qty.	Cost of Each Hospital
Clinical Center	Color Doppler	15 patients/day, consumable : printer paper	250	1	250
	Patient Monitor	1 patients/day, consumable : electrode	440	7	3,080
Total Cost of the Clinical Center					3,330
General Hospital Niksic	Color Doppler	15 patients/day, consumable : printer paper	250	1	250
	Blood Gas Analyzer	5 patients/day, consumable : electrode, reagent	2,000	1	2,000
	Gastrofiberscope	7 patients/day, consumable : bulb	50	2	100
	Colonofiberscope	3 patients/day, consumable : bulb	50	1	50
	Laryngofiberscope	1 patients/day, consumable : bulb	50	1	50
	Fiberscope System	10 patients/day, consumable : bulb	50	1	50
	Mobile X-ray Unit	7 patients/day, consumable : film	600	1	600
	Patient Monitor	1 patients/day, consumable : electrode	440	3	1,320
Total Cost of General Hospital Niksic					4,420
General Hospital Kotor	Color Doppler	15 patients/day, consumable : printer paper	250	1	250
	Sigmoidoscope	1 patients/day, consumable : bulb	50	1	50
	Laryngoscope Set	3 patients/day, consumable : bulb	50	1	50
Total Cost of General Hospital Kotor					350

*Estimate Condition :250 Annual working days (Excluding maintenance cost and Procuring consumable from internal market)

(4) Operation and Maintenance Costs as a Proportion of Target Hospital Budget

In the preceding **Table 14**, the figures shown are the expenses to be financed by each target hospital for the operation and maintenance of new equipment. This total as a proportion of average annual operation and maintenance expenditure of each target hospitals for the years 2003 - 2005, gives the modestly higher figures of the Clinical Center (2.2%), General Hospital Niksic (3.6%), and General Hospital Kotor (2.6%), as can be seen in **Table 15**. Given the current improved state

of hospital finances and financing through the state budget of the Health Insurance Fund, the budgetary allowance for running costs brought about by the Project is without any problem. Because the provision of equipment will augment the quality of medical service and efficiency in the hospitals, it can be expected that numbers of patients treated will rise. Along with the higher numbers of diagnosis and treatments, we will see an increase to hospital revenues paid both from the state budget and by patients.

Furthermore, since the Project plans to replace old existing equipment, we can expect to minimize both maintenance costs and power consumption.

**Table 15 Expenses to be Financed by Target Hospitals
for Operation and Maintenance Cost**

Unit: EURO

	Clinical Center	General Hospital Nisic	General Hospital Kotor
①*Annual Operation and Maintenance Cost for Procured Equipment	3,330	4,420	350
② Annual Budget of Operation and Maintenance (Average:20003 – 2005)	887,854	67,735	26,684
Ratio (① / ②×100)	0.37%	3.53%	1.31%

*except for existing equipment

2-5 Estimated Cost of the Project

(1) Expense Borne by Japanese Side

Total cost of Japanese side is estimated at approximately JPY 441.25 million. The total cost of the plan is composed of procurement cost of equipment, as well as equipment transportation to target hospitals, delivery and installation / trial run of the equipment, guidance for operation / maintenance.

Still, this cost estimate is provisional and would be further examined by the Government of Japan for the approval of the Grant Aid Guidance.

Table 16 Project Cost Estimation

Total Estimation Cost JPY 441.25 million

Contents		Estimation Cost (million JPY)
Equipment	Clinical Center	208.83
	General Hospital Nisic	114.81
	General Hospital Kotor	93.64
Dispatch of Manager, Supervisor and Engineer		23.97

(2) Expense Borne by Montenegrin Side

The removal of existing CT scanner, fluoroscopy unit, general X-ray unit and operation lamp in the Clinical Center and General Hospital Kotor shall be borne by the Montenegrin side.

The necessary cost can be estimated as follow.

Table 17 Contents of Expense Borne by Montenegrin Side

Target Hospital	Removal Items	Expense
Clinical Center	Removal of CT scanner, general X-ray unit, operation lamp	Euro 1,392
General Hospital Kotor	Removal of fluoroscopy unit, general X-ray unit, operation lamp	Euro 1,116
Total		Euro 2,508

*No removal item in General Hospital Niksic for the Project

(3) Condition of Cost Estimation

Estimated as of : August 2006

Exchange rate : 1 US \$ = 115.33 YEN 1EURO=146.13YEN

Implementation Schedule : Refer to **Table 9**

Others : The Project shall be implemented in accordance with Japan's Grant Aid scheme

Chapter 3

Project Evaluation and Recommendations

Chapter 3 Project Evaluation and Recommendations

3-1 Project Effect

As the target hospitals including the Clinical Center, the top referral hospital, which accepts all patients across Montenegro, the target beneficiaries of the Project will be the all 620,000 of Montenegro's inhabitants (2005 statistics), meanwhile, the Clinical Center also provides the secondary level medical services to the surrounding areas, together with secondary hospitals, General Hospital Niksic and General Hospital Kotor - the main hospitals in the north and southern coastal region, the covered population will be about 410,000. The quality of the secondary medical services to roughly 66% of the total population will be improved; hence the resultant benefits felt will be far-reaching.

Furthermore, the patients now being sent outside the country (some 7,115 in 2005) will be able in future to receive diagnosis and treatment within Montenegro. Positive impacts on the country's medical finances are to be expected.

1) Direct Effects

- The quality of the secondary medical services to roughly 410,000 people (some 66% of the total population) will be improved by the procurement of medical equipment in the Clinical Center and in Niksic and Kotor general hospitals - the main hospitals in the north and southern coastal region.
- The quality of the tertiary medical services to all 620,000 of Montenegro's inhabitants will be improved by the procurement of medical equipment in Montenegro's only tertiary hospital.
- The patients now being sent outside the country (some 7,115 in 2005) will be able in future to receive diagnosis and treatment within Montenegro. Reducing the patients' burden in accessing medical services and the increased revenue from medical services at Montenegrin hospitals will have a positive impact on the country's medical finances.

2) Indirect Effects

- The referral system within Montenegro will be strengthened.
- Montenegro's national health indicators will be improved.

3-2 Recommendations

The high implementing capability of the Ministry of Health for this Project can be expected, therefore, the following measures are proposed to ensure the quick and effective realization of this Project.

(1) Modernization of Structure and Management of Hospitals

Joint ownership and centralized use of medical equipment among different departments of the target hospitals is expected in order to most efficiently and effectively use the medical equipment procured under the Project. However, at the present time the actual disposition of facilities (including disposition of the wards) in each department of the target hospitals is still based on an inefficient vertical structure, and there is limited ability to promote joint ownership and centralization of medical equipment for improved efficiency.

It follows that only with a radical reconsideration of the departments in present day facilities of target hospitals, together with more positive concentration of diagnostic units, reconsideration of ward arrangements, and based on all of these reconfiguration of the organization and personnel, with the setting up of a jointly owned and centralized management system for medical equipment, can one hope for improvements in the effective functioning of hospitals.

(2) Stabilization of Health Insurance Fund

Running and maintenance costs for equipment procured for the target hospitals in the Project will be financed by the HIF – the hospitals' main source of income. Montenegro aims to stabilize HIF by adjusting the scale of its hospitals and improving its insurance premium collection system. In so doing, the fund should be on a sound footing within a few years. However, from a long-term perspective, with a weak economic foundation and a precarious government fiscal situation, what is needed is not only an increase in medical resources, but the construction of a system that will promote the stabilization of the insurance fund through the suitable placement of medical workers, the introduction and expansion of a tender system for the purchase of medical equipment and medication and a further reduction in annual expenditure on medical service provision through the establishment of strict standards in medical prescriptions.

(3) Improvement of Standards for the Medical Care of Patients

Since it is the aim of Montenegro to join EU, the modernization of hospital functions is now topical, with the aim of conforming to the standards of medical services in EU countries. There is a need to promote more active consideration to issues such as guaranteeing the privacy of patients in diagnosis and treatment areas and in wards, installing basic features such as curtains surrounding each bed in wards or in diagnostic and treatment areas, and providing privacy for patients and their families. At the same time it is hoped that plans are made to modernize medical treatment in areas such as the obtaining of informed consent, offering detailed guidance concerning the taking of medicines, completion of a medical information system so as to make hospital services logical and effective, shortening of waiting times for diagnosis and treatment, and pushing ahead with measures to realize standards of patient treatment.

Appendices

Appendix-1 Member List of the Study Team

(1) Field Survey

1. Mr. Masao SHIKANO	Leader	Resident Representative JICA Austria Office Japan International Cooperation Agency
2. Dr. Iwao TAKAKURA, M.D., Ph.D	Technical Adviser	Professor Emeritus Tokai University
3. Mr. Takuya OTSUKA	Project Coordinator	Staff, Health Team Project Management Group II Grant Aid Management Department Japan International Cooperation Agency
4. Mr. Keiji IIMURA	Project Manager / Equipment Planner I	ICONS International Cooperation Inc.
5. Mr. Haruo ITO	Healthcare System Researcher	ICONS International Cooperation Inc.
6. Mr. Yoshiharu HIGUCHI	Equipment Planner II	ICONS International Cooperation Inc.
7. Mr. Koji NAGATA	Procurement and Cost Planner	ICONS International Cooperation Inc.

(2) Explanation of Draft Report

1. Mr. Masao SHIKANO	Leader	Resident Representative JICA Austria Office Japan International Cooperation Agency
2. Mr. Tatsuo SUNAHARA	Grant Aid	Grant Aid Division Economic Cooperation Bureau Ministry of Foreign Affairs
3. Dr. Iwao TAKAKURA, M.D., Ph.D	Technical Adviser	Professor Emeritus Tokai University
4. Mr. Keiji IIMURA	Project Manager / Equipment Planner I	ICONS International Cooperation Inc.
5. Mr. Yoshiharu HIGUCHI	Equipment Planner II	ICONS International Cooperation Inc.

Appendix-2 Study Schedule

(1) Field Survey

No.	Date	Movement	Activities	Accommodation
1	Mar. 15	Narita → Vienna ^(D)		Vienna ^(D)
2	Mar. 16	Vienna → Belgrade ^(D)	Visit JICA Austria Office ^(D)	Belgrade ^(D)
3	Mar. 17	Narita → Vienna ^(F) Vienna → Belgrade ^(F)	Visit Embassy of Japan in Serbia and Montenegro ^(D) Sight Survey of previous project ^(D) (Clinical Center of Serbia, Belgrade)	Belgrade ^{(D)(F)}
4	Mar. 18	Narita → Vienna ^(G)	Sight Survey of previous project ^{(D)(F)} (Clinical Center of Serbia, Belgrade)	Belgrade ^{(D)(F)} Vienna ^(G)
5	Mar. 19	Belgrade → Podgorica ^{(D)(F)} Vienna → Podgorica ^(G)	Internal Works ^{(D)(F)(G)}	Podgorica ^{(D)(F)(G)}
6	Mar. 20		Explanation of Inception Report in MOH ^(D) Explanation of Inception Report in CC ^(D) Sight Survey in CC ^{(D)(F)} Survey for procurement ^(G)	Podgorica ^{(D)(F)(G)}
7	Mar. 21		Explanation of Inception Report in CC ^(D) Sight Survey in CC ^{(D)(F)} Survey for procurement ^(G)	Podgorica ^{(D)(F)(G)}
8	Mar. 22		Explanation of Inception Report in Kotor GH ^(D) Sight Survey in Kotor GH ^{(D)(F)} Survey for procurement ^(G)	Podgorica ^(D) Kotor ^{(F)(G)}
9	Mar. 23		Discussion in MOH ^(D) Sight Survey in Kotor GH ^(F) Survey for procurement ^(G)	Podgorica ^{(D)(F)(G)}
10	Mar. 24		Explanation of Inception Report in Niksic GH ^(D) Sight Survey in Niksic GH ^{(D)(F)} Survey for procurement ^(G)	Niksic ^{(D)(F)(G)}
11	Mar. 25	Narita → Vienna ^(E)	Sight Survey in Niksic GH ^{(D)(F)} Survey for procurement ^(G)	Podgorica ^{(D)(F)(G)} Vienna ^(E)
12	Mar. 26	Narita → Vienna ^(B) Vienna → Podgorica ^(E)	Internal Works ^{(D)(E)(F)(G)} Meeting within the Team ^{(D)(E)(F)(G)}	Podgorica ^{(D)(E)(F)(G)} Vienna ^(B)
13	Mar. 27	Vienna → Belgrade ^(B) Belgrade → Podgorica ^(B)	Discussion in MOH ^(D) Sight Survey in CC ^{(D)(F)} Survey in MOH ^(E) Survey for Transportation ^(G)	Podgorica ^{(B)(D)(E)(F)(G)}
14	Mar. 28		Discussion in MOH ^{(B)(D)} Sight Survey in CC ^{(D)(F)} Survey in MOH ^(E) Survey for Transportation ^(G)	Podgorica ^{(B)(D)(E)(F)(G)}
15	Mar. 29		Discussion in Kotor GH ^{(B)(D)} Sight Survey in Kotor GH ^{(D)(F)} Survey for other donors ^(E) Survey for Transportation ^(G)	Podgorica ^{(B)(D)(E)(F)(G)}
16	Mar. 30		Discussion in Niksic GH ^{(B)(D)} Sight Survey in Niksic GH ^{(D)(F)} Survey for other donors ^(E) Survey for Transportation ^(G)	Podgorica ^{(B)(D)(E)(F)(G)}
17	Mar. 31		Discussion in MOH, CC ^{(B)(D)} Sight Survey in CC ^{(D)(F)} Survey in CC ^(E) Survey for Transportation ^(G)	Podgorica ^{(B)(D)(E)(F)(G)}
18	Apr. 1	Narita → Vienna ^{(A)(C)}	MD Discussion in MOH ^{(B)(D)} Sight Survey in Niksic GH ^(F) Survey in Niksic GH ^(E) Survey for procurement ^(G)	Vienna ^{(A)(C)} Podgorica ^{(B)(D)(E)(F)(G)}
19	Apr. 2	Vienna → Podgorica ^{(A)(C)}	Internal Works, Meeting within the Team ^{(A)(B)(C)(D)(E)(F)(G)}	Podgorica ^{(A)(B)(C)(D)(E)(F)(G)}

No.	Date	Movement	Activities	Accommodation
20	Apr. 3		MD Discussion in MOH ^{(A) (B) (C) (D)} MD Signing ^{(A) (B) (C) (D)} Visit MOFA ^{(A) (B) (C) (D)} Sight Survey in Kotor GH ^(F) Survey in Kotor GH ^(E) Survey for procurement ^(G)	Podgorica ^{(A) (B) (C) (D) (E) (F) (G)}
21	Apr. 4		Sight Survey in Niksic GH ^{(A) (B) (C) (D)} Survey in CC ^(E) Sight Survey in CC ^(F) Survey for procurement ^(G)	Podgorica ^{(A) (B) (C) (D) (E) (F) (G)}
22	Apr. 5	Podgorica → Belgrade ^{(A) (B) (C)}	Visit Embassy of Japan in Serbia and Montenegro ^{(A) (B) (C)} Survey in CC ^{(D) (E)} Sight Survey in CC ^(F) Survey for procurement ^(G)	Belgrade ^{(A) (B) (C)} Podgorica ^{(D) (E) (F) (G)}
23	Apr. 6	Belgrade → Vienna ^{(A) (B) (C)} Podgorica → Belgrade ^(F) Podgorica → Vienna ^(G)	Visit JICA Austria Office ^{(A) (B) (C)} Survey for other donors ^{(D) (E)} Survey for procurement in Belgrade ^(F)	Vienna ^{(A) (B) (C) (G)} Belgrade ^(F) Podgorica ^{(D) (E)}
24	Apr. 7	Vienna ^{(A) (B) (C) (G)} →	Survey in MOH, HIF ^{(D) (E)} Sight Survey of previous project ^(F) (Clinical Center of Serbia, Belgrade)	Belgrade ^(F) Podgorica ^{(D) (E)}
25	Apr. 8	→ Narita ^{(A) (B) (C) (G)}	Survey in MOH, HIF ^{(D) (E)} Survey for procurement in Belgrade ^(F)	Belgrade ^(F) Podgorica ^{(D) (E)}
26	Apr. 9	Podgorica → Vienna ^(E) Belgrade → Vienna ^(F) Vienna ^(F) →	Internal Works ^(D)	Podgorica ^(D) Vienna ^(E)
27	Apr. 10	→ Narita ^(F) Vienna ^(E) →	Supplemental Study ^(D)	Podgorica ^(D)
28	Apr. 11	→ Narita ^(E) Podgorica → Belgrade ^(D)	Supplemental Study ^(D)	Belgrade ^(D)
29	Apr. 12	Belgrade → Vienna ^(D)	Visit Embassy of Japan in Serbia and Montenegro ^(D)	Vienna ^(D)
30	Apr. 13	Vienna ^(D) →	Visit JICA Austria Office ^(D)	
31	Apr. 14	→ Narita ^(D)		

(A) Leader, (B) Technical Advisor, (C) Project Coordinator, (D) Project Manager / Equipment Planner 1, (E) Equipment Planner II, (F) Healthcare System researcher, (G) Procurement and Cost Planner

CC: Clinical Center of Montenegro in Podgorica, HIF: Health Insurance Fund, JICA: Japan International Cooperation Agency, Kotor GH: General Hospital Kotor, MD: Minutes of Discussion, MOFA: Ministry of Foreign Affairs, MOH: Ministry of Health, Niksic GH: General Hospital Niksic

(2) Explanation of Draft Report

No.	Date	Movement	Activities	Accommodation
1	Aug. 16	Narita → Zurich ^(D) Zurich → Vienna ^(D)		Vienna ^(D)
2	Aug. 17	Vienna → Belgrade ^(D)	Visit JICA Austria Office ^(D)	Belgrade ^(D)
3	Aug. 18		Visit Embassy of Japan in Serbia and Montenegro ^(D)	Belgrade ^(D)
4	Aug. 19	Belgrade → Podgorica ^(D) Narita → Zurich ^(E) Zurich → Vienna ^(E)		Podgorica ^(D) Vienna ^(E)
5	Aug. 20	Vienna → Podgorica ^(E)	Internal Works ^{(D)(E)}	Podgorica ^{(D)(E)}
6	Aug. 21		Explanation of Draft Report in MOH ^{(D)(E)}	Podgorica ^{(D)(E)}
7	Aug. 22		Explanation of Specifications in CC ^{(D)(E)}	Podgorica ^{(D)(E)}
8	Aug. 23	Narita → Munich ^(C)	Explanation of Draft Report in MOH ^(D) Explanation of Specifications in CC ^(E)	Munich ^(C) Podgorica ^(D) Kotor ^(E)
9	Aug. 24	Munich → Vienna ^(C) Vienna → Podgorica ^(C)	Explanation of Draft Report in MOH ^(D) Explanation of Specifications in Kotor GH ^(E)	Podgorica ^{(C)(D)(E)}
10	Aug. 25		Explanation of Draft Report in MOH ^{(C)(D)} Explanation of Specifications in Niksic GH ^{(C)(D)(E)}	Podgorica ^{(C)(D)(E)}
11	Aug. 26	Narita → Vienna ^(B)	Internal Works ^(C) Supplemental Study ^{(D)(E)}	Vienna ^(B) Podgorica ^{(C)(D)(E)}
12	Aug. 27	Vienna → Podgorica ^{(A)(B)}	Briefing for Leader etc. ^{(A)(B)(C)(D)(E)}	Podgorica ^{(A)(B)(C)(D)(E)}
13	Aug. 28	Podgorica → Belgrade ^(C) Belgrade → Munich ^(C) Munich ^(C) →	MD Discussion in MOH ^{(A)(B)(D)(E)} EN Discussion in MOFA ^(B) Visit CC ^{(A)(B)}	Podgorica ^{(A)(B)(D)(E)}
14	Aug. 29	→ Narita ^(C)	MD Signing ^{(A)(B)(D)(E)} Discussion in MOFA ^{(A)(B)(D)}	Podgorica ^{(A)(B)(D)(E)}
15	Aug. 30	Podgorica → Belgrade ^{(A)(B)} Podgorica → Ljubljana ^(E) Ljubljana → Zurich ^(E)	Visit Embassy of Japan in Serbia and Montenegro ^{(A)(B)} Discussion in MOH ^(D) Supplemental Study ^(E)	Belgrade ^{(A)(B)} Podgorica ^(D) Zurich ^(E)
16	Aug. 31	Belgrade → Vienna ^(B) Podgorica → Vienna ^(D) Zurich ^(E) →	Supplemental Study ^(D)	Vienna ^{(B)(D)}
17	Sept. 1	Vienna ^{(B)(D)} → → Narita ^(E)	Visit JICA Austria Office ^{(B)(D)}	
18	Sept. 2	→ Narita ^{(B)(D)}		

(A) Leader, (B) Grant Aid, (C) Technical Advisor, (D) Project Manager / Equipment Planner I, (E) Equipment Planner II

CC: Clinical Center of Montenegro in Podgorica, EN: Exchange of Notes, JICA: Japan International Cooperation Agency, Kotor GH: General Hospital Kotor, MD: Minutes of Discussion, MOFA: Ministry of Foreign Affairs, MOH: Ministry of Health, Niksic GH: General Hospital Niksic

Appendix-3 List of Parties Concerned in the Recipient Country

Affiliation	Position & Specification	Name
Governmental Organization		
Ministry of Health	Minister	Dr. Miodrag Pavlicic
	Deputy Minister	Ms. Smiljka Kotlica
	Deputy Minister	Dr. Slobodanka Krivokapic
	Adviser to the Minister	Ms. Tijana Kavaric
Health Insurance Fund	Director	Mr. Ramo Bralic
Ministry of Foreign Affairs	Minister	Mr. Miodrag Vlahovic
	Secretary to the Minister	Ms. Veliko Milonjic
International Organization		
World Bank	PMN Coordinator	Ms. Mina Brajovic
WHO	Director of Sub Office	Dr. Mira Jovanovski Dasic
EAR	Program Coordinator	Ms. Regina De Dominicis
Council of Europe	Head of Office	Mr. Vladimir Ristovski
USAID	Chief of General Development Office	Ms. Amy Nolan Osborn
CHF International	RH Program Officer	Dr. Olivera Prodanovic
Target Hospitals		
• Clinical Center of Montenegro in Podgorica		
	President Board of Director	Dr. Milan Miljovic
	Director of Clinical Center	Dr. Miodrag Djurovic
	Technical Director	Mr. Nenad Poleksic
	Director of Laboratory	Dr. Ratko Radvic
	Head Nurse	Ms. Dubravka Vukashevic
	Engineer	Mr. Pavle Aligrudic
Internal Medicine	Doctor	Dr. Vurecvic Dejan
GY and OB	Doctor	Dr. Ljekarska Soba
	Doctor	Dr. Lorica Ljuanovic Vuceranovic
	Doctor	Dr. Snezana Paspopovic
ENT	Chief of Clinic	Dr. Nada Vucinich
	Director	Dr. Mirko Popovich
Laboratory	Director	Dr. Nada Popovich
Emergency	Chief of Clinic	Dr. Radka Nusoshevic
Neurology	Chief of Clinic	Dr. Miroana Cukich
Children Disease	Director	Dr. Omer Adzovic
Pediatric	Chief of Clinic	Dr. Vesna Mizanovic
X-ray	Chief of Clinic	Dr. Olivera Nikolic
• Kotor General Hospital		
	President of Board of Director	Dr. Bozidar Petricevic
	Director of Hospital	Dr. Nebojsa Bjelica
Surgery	Chief of Department	Dr. Ivan Ilic
Internal Medicine	Doctor	Dr. Ilijana Krivokapic
Infection Disease	Chief of Department	Dr. Vesna Momcilovic

Affiliation	Position & Specification	Name
	Doctor	Dr. Ljiljana Radman
ICU	Doctor	Dr. Dusan Milenkovic
	Chief of Anesthesia	Dr. Jela Bukvic
GY and OB	Chief of Department	Dr. Bozidar Petricevic
	Doctor	Dr. Dorde Klajn
X-ray	Doctor	Dr. Predrag Jovanovic
Pediatric	Chief of Department	Dr. Zoja Maslovar
ORL	Doctor	Dr. Mato Petrovic
Biochemical laboratory	Chief of Department	Dr. Dusanka Zmukic
• Niksic General Hospital		
	Director of Hospital	Dr. Ilija Ashanin
	Director of Hospital	Dr. Miso Pejakovic
	President of Managing Board	Dr. Senka Ljumovic
	Financial Director	Mr. Mededovic Slavic
Emergency	Nurse	Ms. Bozovid Jela
Operation Room	Doctor	Dr. Durovic Bela
Radiology	Doctor	Dr. Anka Stanisic
Surgery	Nurse	Ms. Jalranka Nikcevic
Ophthalmology	Doctor	Dr. Maskimovic
Urology	Doctor	Dr. Miltin Rodulovic
OB and GY	Doctor	Dr. Tamara Mijuskovic
Internal Medicine	Doctor	Dr. Gordana Reyic
Neurology	Doctor	Dr. Zlata Perovic
Transfusion	Doctor	Dr. Janicic Dragila
Laboratory	Doctor	Dr. Dejan Krirovic
Physiotherapy	Doctor	Dr. Naola Grbovic
Pediatric	Doctor	Dr. Radusa Pejevic
Other Medical Facilities and Organization		
Clinical Center of Serbia Belgrade	Management Director	Dr. Ivan M. Jekic
Agencies of Medical Equipment		
Beolaser		Mr. Dragan Rokic
Medinic		Dr. Radisa Nikolic
Alpha Imaging	General Director	Mr. Predrag Bjeletic
Transportation Companies		
Zetatrans	Director	Mr. Peco Danilovic Dragomir
Horizon Logistics	Director	Mr. Ivan Gazivoda
Monteagent	Director	Mr. Maric Ljiljana
Orion Sped	Director	Mr. Filimonovic Goran
Jevtovic D.o.o	Director	Mr. Milos Jevtovic
Zaljevo Komerc	Director	Mr. Bojevic Isko

Appendix-4 Minutes of Discussion

MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE MONTENEGRO HEALTH SECTOR EQUIPMENT PROJECT
IN THE SERBIA AND MONTENEGRO

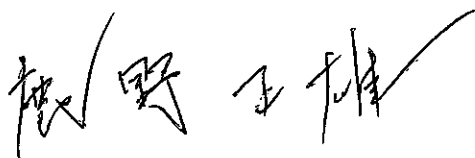
Based on the results of the Preparatory Study, the Government of Japan decided to conduct a Basic Design Study on the Montenegro Health Sector Equipment Project (hereinafter referred to as "the Project") and entrusted the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA sent to the Serbia and Montenegro the Basic Design Study Team (hereinafter referred to as "the Team"), which is headed by Mr. Masao SHIKANO, Resident Representative, JICA Austria Office, and is scheduled to stay in the country from March 16 to April 12, 2006.

The Team held discussions with the officials concerned of the Republic of Montenegro, and conducted a field survey at the study area.

In the course of discussions and field survey, both parties confirmed the main items described on the attached sheets. The Team will proceed to further works and prepare the Basic Design Study Report.

Podgorica, Serbia and Montenegro, April 3, 2006



Masao SHIKANO
Leader
Basic Design Study Team
Japan International Cooperation Agency



Miodrag PAVLICIC
Minister
Ministry of Health
Republic of Montenegro

ATTACHMENT

1 Objective of the Project

The objectives of the Project are to improve the quality and quantity of the health and medical service provided by the targeted Clinical Center/General Hospital, and to strengthen the referral system in the Project sites.

2 Project Sites

The sites of the Project are the Clinical Center of Montenegro in Podgorica, Montenegro, General Hospital Niksic and General Hospital Kotor shown in Annex-1.

3 Responsible and Implementing Agencies

3-1 The Responsible Agency is the Ministry of Health, Republic of Montenegro. Its organization chart is shown in Annex-2(A).

3-2 The Implementing Agencies are the Clinical Center of Montenegro in Podgorica, Montenegro, General Hospital Niksic and General Hospital Kotor. Their organization charts are shown in Annex-2(B), 2(C) and 2(D).

4 Items requested by the Government of Serbia and Montenegro

After discussions with the Team, the items described in Annex-3 were finally requested by Republic of Montenegro. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5 Japan's Grant Aid Scheme

Republic of Montenegro understands the Japan's Grant Aid Scheme and the necessary measures to be taken by Republic of Montenegro as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both parties on September 19, 2005.

6 Schedule of the Study

6-1 The consultants will proceed to further studies in the Serbia and Montenegro until April 12, 2006.

6-2 JICA will prepare the draft report in English and dispatch a mission in order to explain its contents in (or around) the country from July 17th to July 27th, 2006.

6-3 In case that the contents of the report is accepted in principle by Republic of Montenegro, JICA will complete the final report and send it to Republic of Montenegro by the end of October, 2006.



7 Other Relevant Issues

- 7-1 The Republic of Montenegro has agreed to secure and allocate the enough budgets to operate and maintain the medical equipment procured under the Project properly and effectively.
- 7-2 The Republic of Montenegro has agreed to promote the staff recruitment and capacity building for the effective use of the procured equipment by the Project, as a condition for the Project to be implemented.
- 7-3 The Republic of Montenegro will take necessary measures in order to ensure the tax exemption for the equipment procured under the Project.
- 7-4 The Republic of Montenegro will be responsible for removing the old equipment for replacement and preparing the facilities before the installation of the equipment procured under the Project, as a condition for the Project to be implemented.
- 7-5 The Republic of Montenegro will be responsible for securing the rooms and facilities of the equipment for integrated use such as X-ray apparatus, endoscopies, ultrasound equipment, etc. in each hospital.

Annex-1: Project Sites Map

2: Organization Charts

3: Equipment Lists

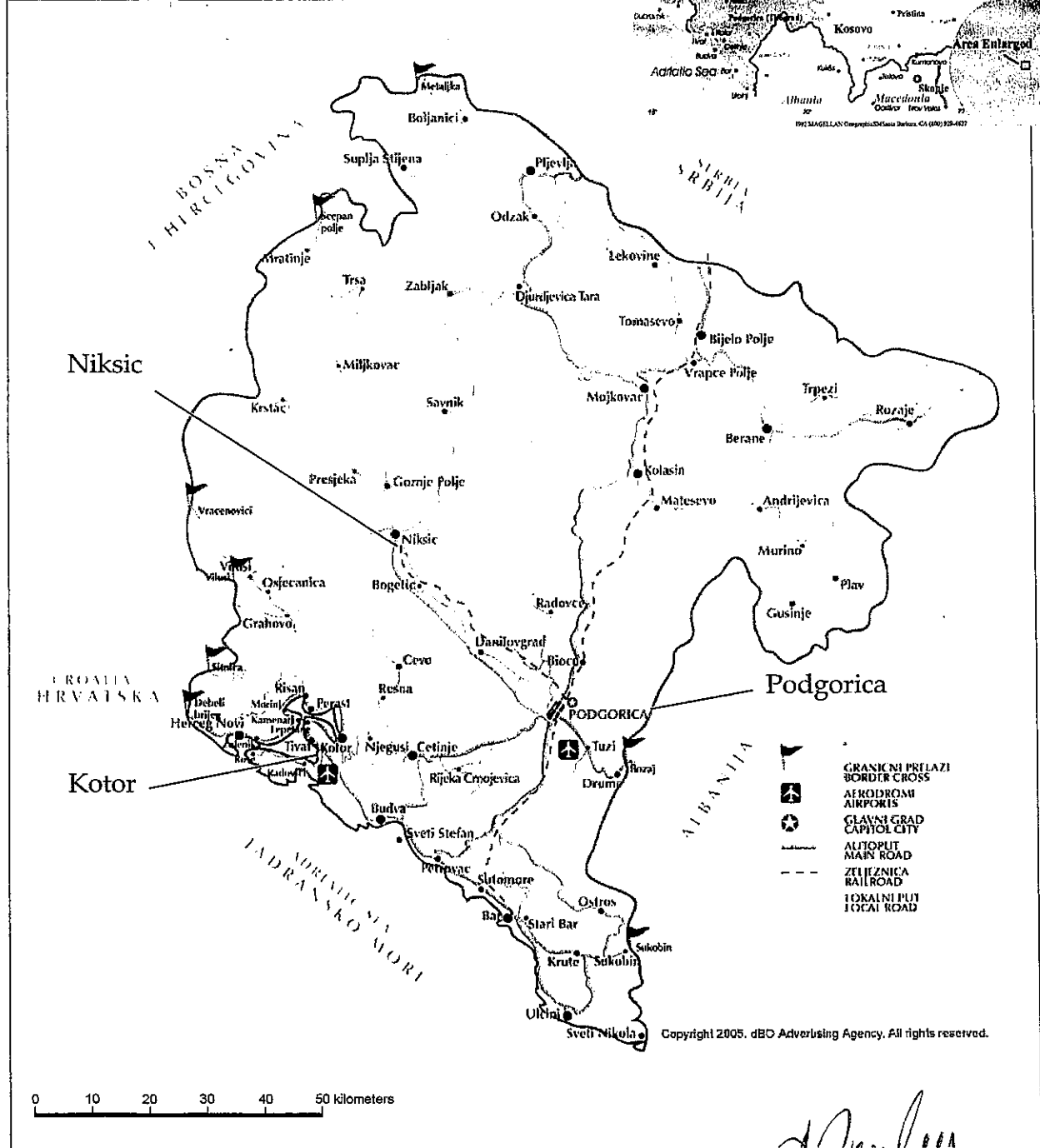


Project Sites Map

Serbia and Montenegro

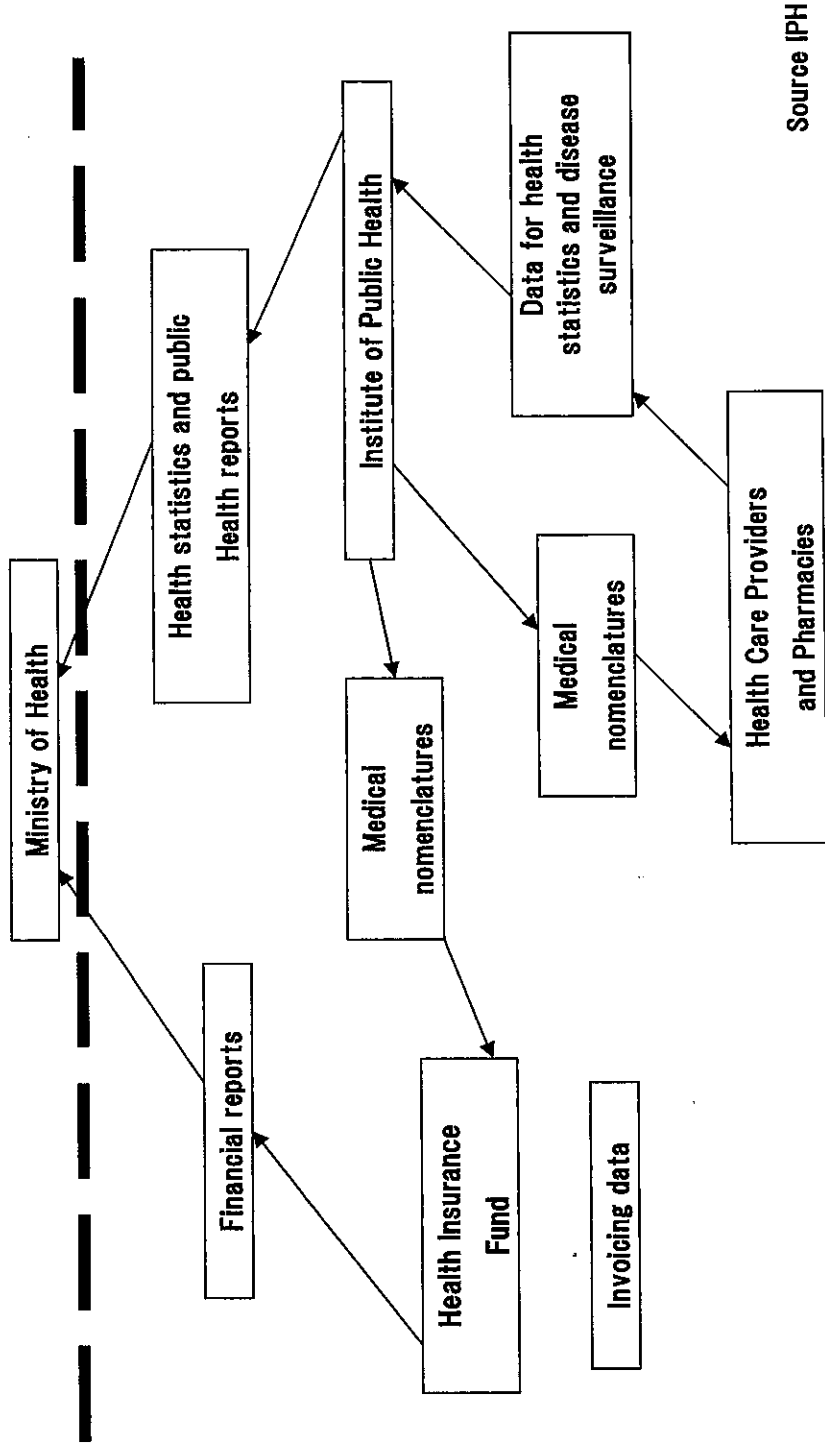


Republic of Montenegro



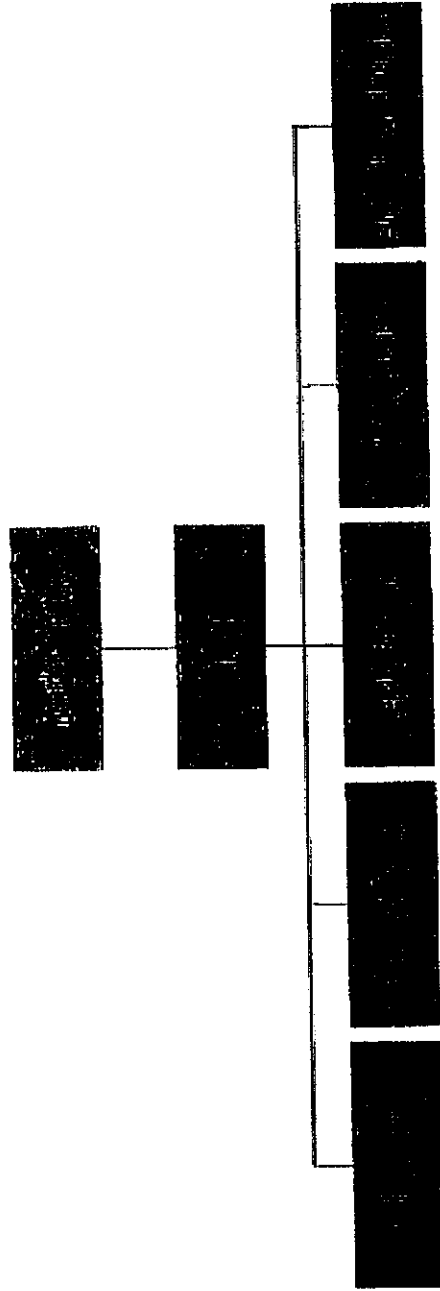
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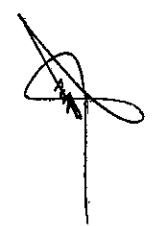
Data flows in health system of Montenegro



Source IPH

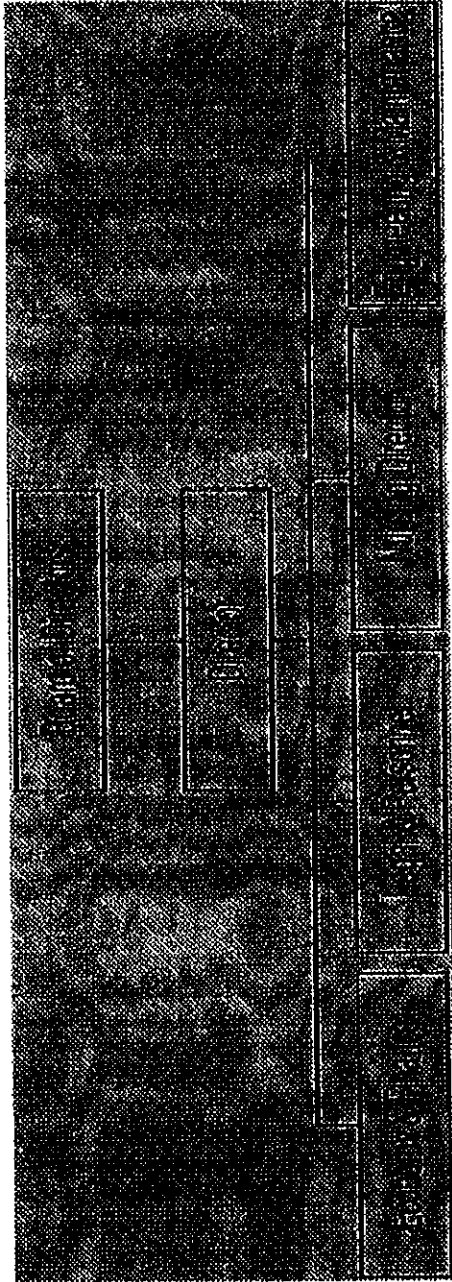
ORGANISATIONAL STRUCTURE Clinic Center



Pauline 

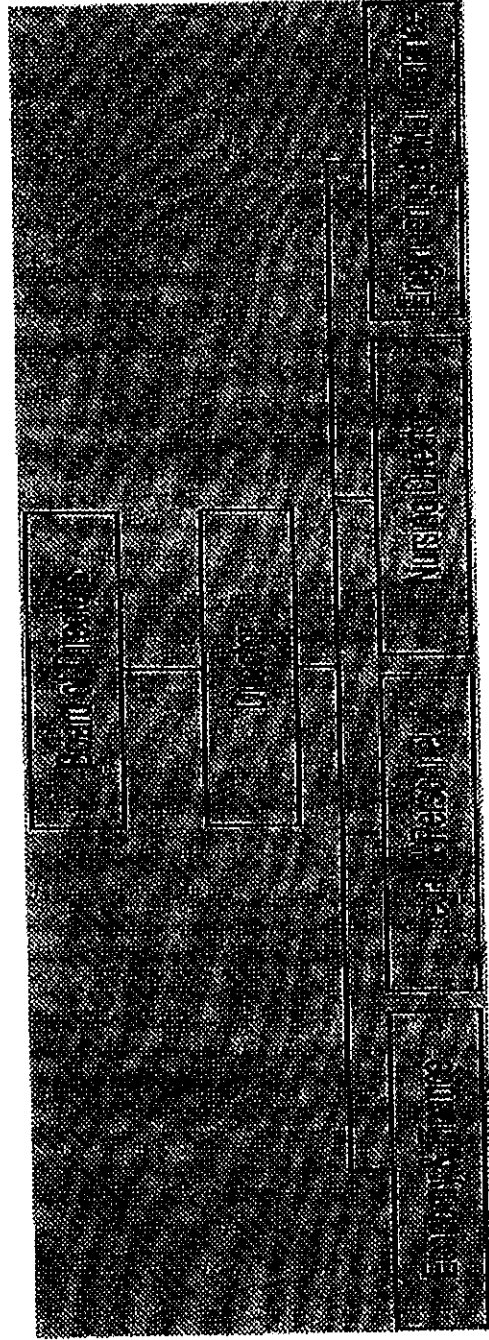
ORGANISATIONAL STRUCTURE


General Hospital Nक्सिक



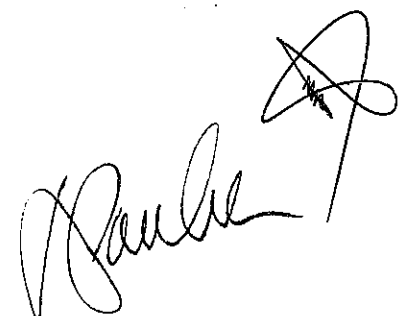
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ORGANISATIONAL STRUCTURE General Hospital Kotor



Paula 

No.	Clinic	Department	Equipment	Qty.	
1	Internal Clinic	Internal Clinic	Gastrofiberscope Video System (3 Gastrofiberscopes)	1	
2			Duodenofiberscope	1	
3			Colonofiberscope	1	
4			Washing Unit for Endoscope	1	
5			ECG	2	
6			Defibrillator	1	
7	Institute for Children Diseases	Neonatology	Infant Ventilator	3	
8			Infant Warmer	1	
9			ECG	1	
10			Infant Incubator	2	
11		Intensive Therapy Section	Patient Monitor	4	
12			ECG	1	
13		Pediatric Clinic	Suction Unit	8	
14			Anesthesia and Reanimation Section	Anesthesia Unit with Monitor	1
15			Infant Warmer	1	
16			Surgical Clinic	Electrosurgical Unit	1
17	Suction Unit			2	
18	Pediatric Clinic		Bronchofiberscope for Pediatric	1	
19		Gastrofiberscope for Pediatric	1		
20		Colonofiberscope for Pediatric	1		
21		Duodenofiberscope for Pediatric	1		
22	X-ray Section	Fiberscope System (Suction, Lightsource, Washing unit)	1		
23		ECG	1		
24		Color Doppler	1		
25		General X-ray Unit	1		
26		Surgical Clinic	Operation Rooms	Operating Table	2
27	Operating Light			2	
28	Anesthesia Unit with Monitor			3	
29	Suction Unit			3	
30	Laparoscope and Urologicalscope System			1	
31	Electrosurgical Unit			1	
32	Intensive Care Unit	Intensive Care Unit	Patient Monitor	10	
33			Ventilator	2	
34			Bronchofiberscope	1	
35	X-ray Center	X-ray Center	Spiral CT Scanner	1	
36			Color Doppler	1	
37			Mammograph Unit	1	
38	Gynecology and Obstetrics	Gynecology and Obstetrics	Ultrasound for GY and OB	1	
39			Colposcope	1	
40			Fetal Doppler	3	
41	Infective Diseases	Infective Diseases	Mobile X-ray Unit	1	
42			Patient Monitor	2	
43			Suction Unit	2	
44	Emergency Department	Emergency Department	Suction Unit	1	
45			Electrosurgical Unit	1	
46			Operation Table	1	
47			Mobile Operation Light	1	
48			Hot Air Sterilizer	1	
49			Anesthesia Unit	1	
50	Pulse Oximeter	1			
51	Neurology	Neurology	Patient Monitor	5	
52			EEG	1	



No.	Clinic	Equipment	Qty.
1	Surgical Clinic (Operation Theater)	Anesthesia Unit with Monitor	1
2		Hot Air Sterilizer	2
3		Suction Unit	4
4		Electrosurgical Unit	3
5		Mobile Operation Light	1
6		Operation Microscope	1
7	Gynecology and Obstetrics Department	Ultrasound for GY and OB	1
8		Patient Monitor	1
9		Colposcope	1
10		Vacuum Extractor	1
11		Infant Incubator	1
12		Fetal Doppler	3
13		ECG	1
14		Syringe Infusion Pump	3
15		Infant Warmer	3
16		Bilirubin Checker	1
17	Phototherapy Unit	1	
18	Internal Department (with Coronary Unit)	ECG	2
19		Pulse Oximeter	1
20		Suction Unit	2
21		Syringe Infusion Pump	5
22		Blood Gas Analyzer	1
23	Emergency Section	Pulse Oximeter	1
24		Suction Unit	1
25		Defibrillator	1
26		Electrosurgical Unit	1
27		Mobile Operation Light	1
28	Intensive Care Unit	Syringe Infusion Pump	5
29		Suction Unit	4
30		Blood Gas Analyzer	1
31		Patient Monitor	4
32		Ventilator	1
33	Surgery Department	Pulse Oximeter	1
34		ECG	1
35	Endoscopy Room	Gastrofiberscope	2
36		Colonofiberscope	1
37		Laryngofiberscope	1
38		Fiberscope System (Suction, Coagulator, Lightsource, Washing Unit)	1
39	Pediatric Department	Nebulizer	2
40		Syringe Infusion Pump	2
41		Patient Monitor	1
42		Pulse Oximeter	1
43		Infant Ventilator	1
44	X-ray Department	Mobile X-ray Unit	1
45		Color Doppler	2
46		Mobile C-arm X-ray Unit	1
47		Mammograph Unit	1
48	Neurology Department	Patient Monitor	2
49		Suction Unit	2
50		ECG	1
51		Syringe Infusion Pump	2
52	Blood Transfusion Section	Centrifuge	1
53		Hematocrit Centrifuge	1
54	Laboratory	Coagulometer	1
55		Electrolyte Analyzer	1
56	Urology	Endoscope System for Urology	1
57	Sterilization	Vertical Steam Sterilizer	2
58	Surgical Treatment Instrument	General Surgical Instrument Set	2
59		Caesarean Instrument Set	1

No.	Department	Equipment	Qty.
1	Surgery Section (Two Operating Rooms)	Electrosurgical Unit	2
2		Suction Unit	2
3		Anesthesia Unit with Monitor	1
4		Laparoscope and Urologicalscope System	1
5		General Surgical Instrument Set	2
6		Operation Lamp	1
7	ICU	Ventilator	1
8	ORL (ENT)	Syringe Infusion Pump	4
9		Examination Light	1
10		Hot Air Sterilizer	1
11	Internal Medicine with Coronary Care Unit	Suction Unit	1
12		EKG	2
13		Defibrillator	1
14		Holter System of EKG	1
15	Endoscope Room	Treadmill system	1
16		Gastrofiberscope	1
17		Colonofiberscope	1
18	Gynecology and Obstetric	Sigmoidoscope	1
19		Gynecological Examination Table	3
20		Suction Unit	3
21		Examination Light	2
22		Colposcope	1
23		Hot Air Sterilizer	1
24		Delivery Table	1
25		Fetal Doppler	2
26	Infant Warmer	2	
27	Children Ward	Phototherapy Unit	1
28		Infant Warmer	1
29		Laryngoscope Set	1
30		Pulse Oximeter	1
31		Nebulizer	1
32		Suction Unit (Low Pressure Type)	1
33	Infant Box (Neonate Nursery)	Infant Warmer	1
34		Digital Infant Scale	1
35		Suction Unit (Low Pressure Type)	1
36		Phototherapy Unit	1
37	Biochemical Laboratory	Blood Cell Counter	1
38		Coagulometer	1
39		Microscope	1
40		Digital Analytical Scale	1
41	Radiology	Fluoroscopy Unit	1
42		General X-ray Unit	1
43		Mobile C-arm X-ray Unit	1
44		Color Doppler	1
45	Transfusion	Hot Air Sterilizer	1
46	Infection Disease Ward	Suction Unit	1

MINUTES OF DISCUSSIONS
ON BASIC DESIGN STUDY ON THE MONTENEGRO
HEALTH SECTOR EQUIPMENT PROJECT
IN THE REPUBLIC OF MONTENEGRO
(EXPLANATION ON DRAFT REPORT)

In March and April, 2006, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Montenegro Health Sector Equipment Project (hereinafter referred to as "the Project") to the Republic of Montenegro (hereinafter referred to as "Montenegro"), and through discussion, field survey, and technical examination of the results in Japan, JICA prepared a draft report of the study.

In order to explain and to consult the Montenegro Team on the components of the draft report, JICA sent to Montenegro the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Masao Shikano, Resident Representative, JICA Austria Office, from August 19 to August 31, 2006.

As a result of discussions and field visits, both sides confirmed the main items described on the attached sheets.

Podgorica, August 29, 2006



Masao SHIKANO
Leader
Draft Report Explanation Team
Japan International Cooperation Agency



Miodrag PAVLICIC
Minister
Ministry of Health
Republic of Montenegro

ATTACHMENT

1 Components of the Draft Report

The Government of Montenegro agreed and accepted in principle the components of the Basic Design Study Draft Report explained by the Team.

2 Japan's Grant Aid Scheme

The Montenegro side understands the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Montenegro as explained by the Team and described in Annex-4 and Annex-5 of the Minutes of Discussions signed by both sides on September 19, 2005.

3 Schedule of the Study

JICA will complete the final report in accordance with the confirmed items and send it to the Government of Montenegro by the end of November 2006.

4 Other Relevant Issues

- 4-1 Both sides confirmed the equipment in Annex-1 that will be included in the Project.
- 4-2 The Republic of Montenegro has agreed to secure and allocate the enough budgets to operate and maintain the medical equipment procured under the Project properly and effectively.
- 4-3 The Republic of Montenegro has agreed to promote the staff recruitment and capacity building for the effective use of the procured equipment by the Project, as a condition for the Project to be implemented.
- 4-4 The Republic of Montenegro will take necessary measures in order to ensure the tax exemption including VAT as well as custom clearance for the equipment procured under the Project.
- 4-5 The Republic of Montenegro will be responsible for removing the old equipment for replacement and preparing the facilities in each hospital before the installation of the equipment procured under the Project, as a condition for the Project to be implemented.
- 4-6 The Republic of Montenegro will be responsible for securing the rooms and facilities of the equipment for integrated use such as X-ray apparatus, endoscopies, ultrasound equipment, etc. in each hospital.
- 4-7 To secure transparency and equity of the tendering procedure, both sides promised not to disclose information related to the Project to the third parties until tender opening.

Annex-1: Equipment Lists



Equipment List for Clinical Center of Montenegro in Podgorica

No.	Clinic	Department	Equipment	Qty.	
1	Internal Clinic	Internal Clinic	Gastrofiberscope Video System (3 Gastrofiberscopes, Monitor System, Light Source, Suction Unit, Coagulator)	1	
2			Duodenofiberscope	1	
3			Colonofiberscope	1	
4			Washing Unit for Endoscope	1	
5			ECG	2	
6			Defibrillator	1	
7	Institute for Children Diseases	Neonatology	Infant Ventilator	3	
8			Infant Warmer	1	
9			ECG for Pediatric	1	
10			Infant Incubator	2	
11			Patient Monitor for Pediatric	4	
12		Intensive Therapy Section	ECG for Pediatric	1	
13			Suction Unit (Wall Mount Type)	8	
14		Anesthesia and Reanimation Section	Anesthesia Unit with Monitor	1	
15			Infant Warmer	1	
16		Surgical Clinic	Electrosurgical Unit	1	
17			Suction Unit	2	
18			Pediatric Clinic	Bronchofiberscope for Pediatric	1
19				Gastrofiberscope for Pediatric	1
20				Colonofiberscope for Pediatric	1
21				Duodenofiberscope for Pediatric	1
22				Fiberscope System (Suction, Lightsource, Washing unit)	1
23			ECG for Pediatric	1	
24		X-ray Section	Color Doppler (4 probes)	1	
25			General X-ray Unit	1	
26		Surgical Clinic	Operation Rooms	Operation Table	2
27				Operation Light	2
28				Anesthesia Unit with Monitor	3
29				Suction Unit	3
30				Laparoscope and Urologicalscope Surgical System	1
31				Electrosurgical Unit	1
32	Intensive Care Unit	Intensive Care Unit	Patient Monitor	10	
33			Ventilator	2	
34			Bronchofiberscope	1	
35	X-ray Center	X-ray Center	Spiral CT Scanner	1	
36			Color Doppler (4 probes)	1	
37			Mammograph Unit	1	
38	Gynecology and Obstetrics	Gynecology and Obstetrics	Ultrasound for GY and OB	1	
39			Colposcope	1	
40			Fetal Doppler	3	
41	Infective Diseases	Infective Diseases	Mobile X-ray Unit	1	
42			Patient Monitor	2	
43			Suction Unit	2	
44	Emergency Department	Emergency Department	Suction Unit	1	
45			Electrosurgical Unit	1	
46			Operating Table	1	
47			Mobile Operation Light	1	
48			Hot Air Sterilizer	1	
49			Anesthesia Unit	1	
50			Pulse Oximeter	1	
51	Neurology	Neurology	Patient Monitor	5	
52			EEG	1	

Equipment List for General Hospital Niksic

No.	Clinic	Equipment	Qty.
1	Surgical Clinic	Anesthesia Unit with Monitor	1
2		Hot Air Sterilizer	2
3		Suction Unit	4
4		Electrosurgical Unit	3
5		Mobile Operation Light	1
6		Operation Microscope	1
7	Gynecology and Obstetrics Department	Ultrasound for GY and OB	1
8		Patient Monitor	1
9		Colposcope	1
10		Vacuum Extractor	1
11		Infant Incubator	1
12		Fetal Doppler	3
13		ECG	1
14		Syringe Infusion Pump	3
15		Infant Warmer	3
16		Bilirubin Checker	1
17	Phototherapy Unit	1	
18	Internal Department (with Coronary Unit)	ECG	2
19		Pulse Oximeter	1
20		Suction Unit	2
21		Syringe Infusion Pump	5
22		Blood Gas Analyzer	1
23	Emergency Section	Pulse Oximeter	1
24		Suction Unit	1
25		Defibrillator	1
26		Electrosurgical Unit	1
27	Mobile Operation Light	1	
28	Intensive Care Unit	Syringe Infusion Pump	5
29		Suction Unit	4
30		Blood Gas Analyzer	1
31		Patient Monitor	4
32		Ventilator	1
33	Surgery Department	Pulse Oximeter	1
34		ECG	1
35	Endoscopy Room	Gastrofiberscope	2
36		Colonofiberscope	1
37		Laryngofiberscope	1
38		Fiberscope System (Suction, Coagulator, Lightsource, Washing Unit)	1
39	Pediatric Department	Nebulizer	2
40		Syringe Infusion Pump	2
41		Patient Monitor for Pediatric	1
42		Pulse Oximeter	1
43		Infant Ventilator	1
44	X-ray Department	Mobile X-ray Unit	1
45		Color Doppler (4 probes)	2
46		Mobile C-arm X-ray Unit	1
47	Mammograph Unit	1	
48	Neurology Department	Patient Monitor	2
49		Suction Unit	2
50		ECG	1
51		Syringe Infusion Pump	2
52	Blood Transfusion Section	Centrifuge	1
53		Hematocrit Centrifuge	1
54	Laboratory	Coagulometer	1
55		Electrolyte Analyzer	1
56	Urology	Endoscope System for Urology	1
57	Sterilization	Vertical Steam Sterilizer	2
58	Surgical Treatment Instrument	General Surgical Instrument Set	2
59		Caesarean Instrument Set	1

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Nauke

Equipment List for General Hospital Kotor

No.	Clinic	Equipment	Qty.
1	Surgery Section (Two Operating Rooms)	Electrosurgical Unit	2
2		Suction Unit	2
3		Anesthesia Unit with Monitor	1
4		Laparoscope and Urologicalscope Surgical System	1
5		General Surgical Instrument Set	2
6		Operation Lamp	1
7	ICU	Ventilator	1
8		Syringe Infusion Pump	4
9	ORL(ENT)	Examination Light	1
10		Hot Air Sterilizer	1
11		Suction Unit	1
12	Internal Medicine with Coronary Care Unit	ECG	2
13		Defibrillator	1
14		Holter System of ECG	1
15		Treadmill system	1
16	Endoscope Room	Gastrofiberscope	1
17		Colonofiberscope	1
18		Sigmoidoscope	1
19	Gynecology and Obstetric	Gynecological Examination Table	3
20		Suction Unit	3
21		Examination Light	2
22		Colposcope	1
23		Hot Air Sterilizer	1
24		Delivery Table	1
25		Fetal Doppler	2
26		Infant Warmer	2
27	Children Ward	Phototherapy Unit	1
28		Infant Warmer	1
29		Laryngoscope Set	1
30		Pulse Oximeter	1
31		Nebulizer	1
32		Suction Unit (Low Pressure Type)	1
33	Infant Box	Infant Warmer	1
34		Digital Infant Scale	1
35		Suction Unit (Low Pressure Type)	1
36		Phototherapy Unit	1
37	Biochemical Laboratory	Blood Cell Counter	1
38		Coagulometer	1
39		Microscope	1
40		Digital Analytical Scale	1
41	Radiology	Fluoroscopy Unit	1
42		General X-ray Unit	1
43		Mobile C-arm X-ray Unit	1
44		Color Doppler (5 probes)	1
45	Transfusion	Hot Air Sterilizer	1
46	Infection Disease Ward	Suction Unit	1




Appendix-5 References

	Name	Publisher	Year
1	Statistical Yearbook 2005	Montenegro Statistical Office	2005
2	Clinical Centre Montenegro, Strategic Hospital Development Plan, Final Report	Solve Consulting	2006
3	Master Plan Development of Health Care System in Montenegro for the Period 2005-2010	Ministry of Health	2005
4	Strategy for Health Care Development in Montenegro	Ministry of Health	2003
5	Project Appraisal Document on a Proposed Credit in the Amount of SDR 4.9 Million to Serbia and Montenegro for a Montenegro Health System Improvement Project	The World Bank	2004