NO.

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR
IMPROVEMENT OF MEDICAL EQUIPMENT
FOR HOSPITALS IN YANGON
IN
THE UNION OF MYANMAR

March 2002

JAPAN INTERNATIONAL COOPERATION AGENCY

BINKO LTD.

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PREFACE

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

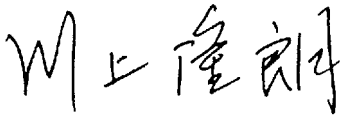
JICA sent to Myanmar a study team from Nov. 4 to Nov. 29, 2001.

The team held discussions with the officials concerned of the Government of Myanmar, 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 Myanmar 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 the Union of Myanmar for their close cooperation extended to the teams.

March, 2002



Takao Kawakami
President
Japan International Cooperation Agency

March, 2002

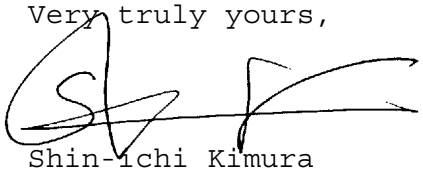
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for Improvement of Medical Equipment for Hospitals in Yangon in the Union of Myanmar.

This study was conducted by Binko Ltd., under a contract to JICA, during the period from November, 2001 to March, 2002. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Myanmar 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,



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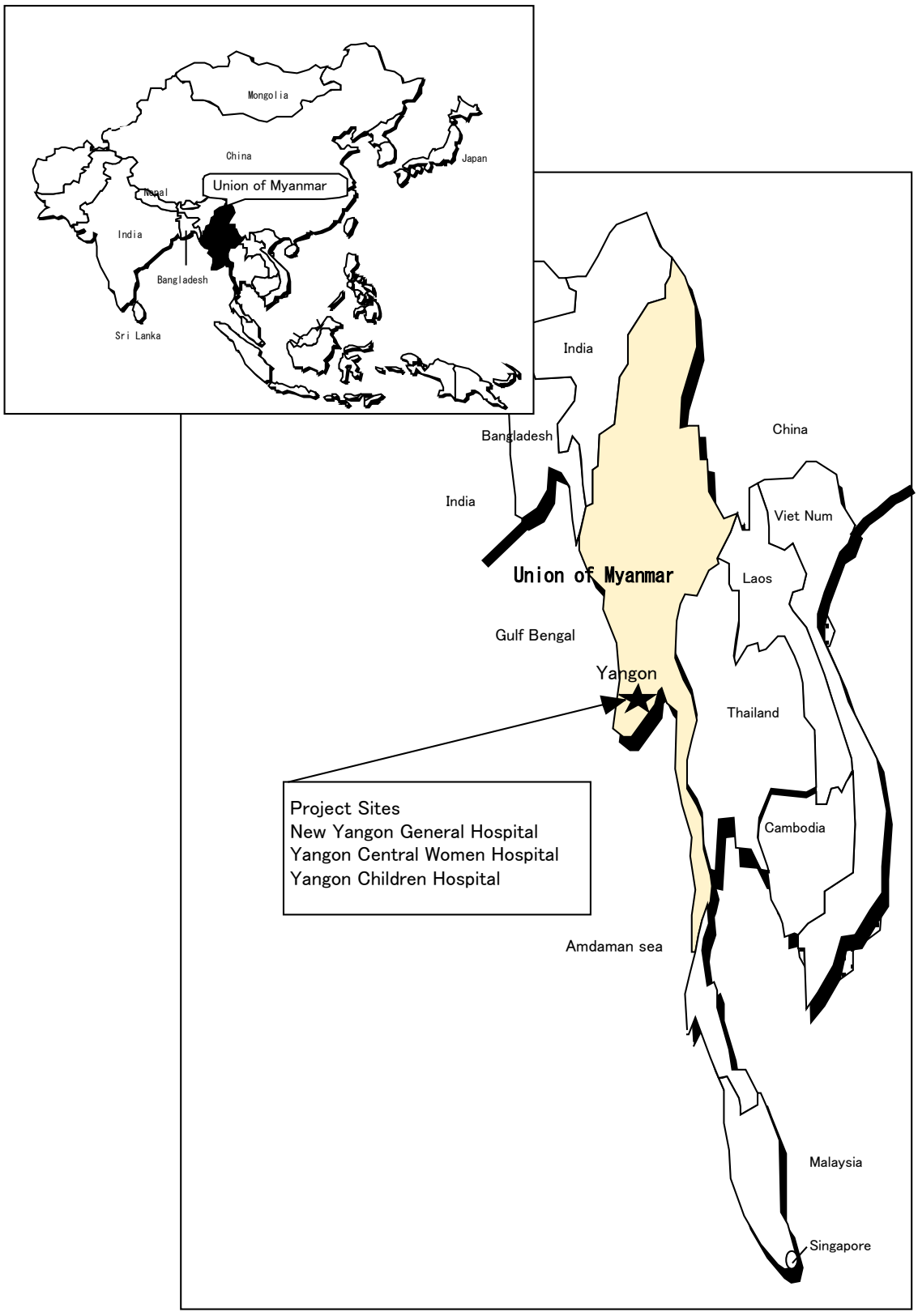
Basic design study team on the Project for Improvement of Medical Equipment for Hospitals in Yangon
Binko Ltd.

LOCATION MAP



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Abbreviation

A/P	Authorization to Pay
AVR	Auto Voltage Regulator
B/A	Banking Arrangement
BHN	Basic Human Needs
CCU	Coronary Care Unit
CICU	Coronary Intensive Care Unit
CMSD	Central Medical Supply Department
CT	Computer Tomography X-ray Unit
E/N	Exchange of Notes
ICU	Intensive Care Unit
MCH	Maternal and Child Health
NHL	National Health Laboratory
NGO	Non Governmental Organization
NPO	Non Profit Organization
PHC	Primary Health Care
UNDP	United Nations Development Programme
UNICEF	United Nations International Children's Fund
UPS	Uninterrupted Power Supply
WHO	World Health Organization

SUMMARY

The Ministry of Health of the Union of Myanmar aims at the improvement of the national health level, and has kept working systematically for the aim by enhancing the inter-agency cooperation and by improving the infrastructure. However, the infant mortality has been slightly aggravated from 46/1,000 births of 1978 to 47.8/1,000 births of 1999. The maternal mortality of 1998 presented by the Ministry of Health shows 180/100,000 births in the rural area against 100/100,000 births in the city area. It proves that the regional disparity still remains in health index between the city area and the rural area. The problem in the rural area is a delay of penetration of the medical services to the children, and the pregnant and parturient women.

The hierarchy of the medical facilities in Myanmar is formed under 40 special hospitals and general hospitals on the central level, where the medical services of specialization and high quality are provided, at the top of the hierarchy. And those are followed by the 32 state/district/county hospitals, 349 township hospitals, and 380 station hospitals. In almost all the hospitals, the medical services cannot be provided properly due to the technical difficulties and the chronic shortage of medical equipment from tight financial conditions. Also in each project hospital (the New Yangon General Hospital, the Yangon Central Women Hospital, and the Yangon Children Hospital), the improvement has not been made for both the facilities and the equipment due to the financial difficulties, and it causes a problem that the medical services for the patients have been debased due to the aging degradation of the equipment. Therefore, even the patients in the low-income class have to depend on the private hospitals, where medical care is provided at a charge of large sum.

Under such situation, the Ministry of Health settled on "the Third National Health Plan 1996-2001". And the following 6 basic programs have been carried out; 1) the improvement plan of the community health, 2) the countermeasures to diseases, 3) the improvement plan of medical facilities, 4) the improvement plan of environmental health, 5) the development plan of health service system, and 6) the improvement plan of organizational control system. The 47 concrete goals were established under the above 6 programs, including the reduction of neonatal mortality and maternal mortality and the enrichment of the advanced medical services. Based on these programs to achieve the goals, the Ministry has aimed at qualitative and quantitative improvement of the

health and medical services on the national level. These aims are succeeded to "the Forth National Health Plan 2002-2006".

As part of the aforesaid National Health Plan, the Union of Myanmar has striven for improvement of the medical services, such as the recovery of medical function at the high-ranking referral hospitals and the increase in lifesaving ratio and therapeutic ratio, under "the improvement plan of medical facilities" that is one of the basic programs. And, Myanmar requested a Grant Aid to Japan with a view to renewing and replenishing the medical facilities and equipment at the project hospitals (the New Yangon General Hospital, the Yangon Central Women Hospital, and the Yangon Children Hospital), which are the top referral hospitals in the Lower-Burma region among the high-ranking hospitals.

In response to the request, the Government of Japan decided to conduct a Basic Design Study. The Japan International Cooperation Agency (JICA) sent a study team to Myanmar from November 4th to November 30th, 2001. The team held discussions with the officials concerned of the Government of Myanmar on the background and details of this project, and made confirmation and resource acquisition in Myanmar. After the team returned to Japan, further study was made. Then, a mission was sent to Myanmar from January 21st to February 3rd, 2002, in order to explain the Draft Report on the Basic Design Study. Consequently, this Basic Design Study Report was completed.

As a result of the field survey, the necessity and appropriateness were admitted for the implementation of this project owing to the following reasons.

① The project facilities are ranked as top referral hospital in Myanmar as to the urologic surgery, obstetrics, gynecology, pediatrics, etc. The implementation of this project is important in promoting the National Health Plan of this country.

② The existing equipment of each project facility drastically exceeds the period of durability, and it causes remarkable stagnation with the medical activities. The project facilities are the top referral hospitals, where the serious patients are finally referred, as to the urology, the obstetrics, the gynecology, and the pediatrics. Therefore, it is urgently necessary to recover the function of each facility.

③ The equipment to be procured under this project was planned with the aim of renewing or replenishing the existing equipment in each project facility. After implementation of this project, such equipment can be operated and maintained at the current technical level of the existing personnel and current human resources in Myanmar.

④ Each project facility, mainly the New Yangon General Hospital, has been assigned as an educational facility for medical students. By the improvement of equipment, such indirect effect can be expected that medical students are provided with the places for training of high quality.

⑤ The purpose of the project supports "BHN", and it meets the aim of the Japan's Grant Aid program.

Meanwhile, it was decided that the following equipment was excluded from this procurement plan as a result of the field survey.

① Such equipment as sphygmomanometer and endtracheal catheter was judged that Myanmar could procure it by his own efforts.

② As for some of the equipment for the laboratory such as biochemistry analyzer and electrolyte analyzer, each hospital has entrusted the analysis to the external institution (the National Health Laboratory : NHL).

As for selection of the equipment to be procured to each project facility, the basic policies were established as follows.

The New Yangon General Hospital

This hospital was established by the Japan's Grant Aid, and this is deemed to represent the Japanese assistance to Myanmar in the medical field. However, most of the existing equipment exceeds the period of durability and is in aging degradation, and it is the time for renewal.

In this project, the procurement shall be made for 1) the equipment that is indispensable for the specialized medical activities in this hospital, and 2) the equipment that is expensive and difficult to procure by self-efforts. This project aims at recovering the function as a top referral hospital in Yangon city and as a teaching hospital for the Yangon Medical University.

The Yangon Central Women Hospital

The big problem of this hospital is a decline of the medical activities due to aging degradation of the equipment. This hospital has promoted introduction of the cost-sharing system, and keeps working to secure the funds for purchase of equipment and the operating funds of this facility. However, the renewal has not been made for almost all the equipment. Through improvement of the equipment for the obstetrics, the gynecology, and the neonatology, this project aims at improving the lifesaving ratio for pregnant women and neonates in this hospital, and also aims at recovering the function as a top referral hospital in the maternal and child health.

The Yangon Children Hospital

This hospital is a top referral facility for the patients with infantile disease, and the serious patients are transferred from hospitals all over the country. However, most of the existing equipment is too old for use, and drastically exceeds the period of durability. This disturbs the provision of the proper medical services and brings about decrease in the lifesaving ratio in this hospital. This hospital keeps working for securing the operating funds of this facility through the cost sharing, the contribution from the civilian, and the set up of the trust fund. However, enough funds are not secured for making sufficient renewal of equipment. By procuring the equipment indispensable for the medical services to neonates and infants in this project, it may enable this hospital to recover the function as a top referral hospital and to restore the reliance of the people to this hospital.

Accordingly, the items and the quantity of the equipment to be procured in this project are as follows.

Project site	Procured equipment under the project	
	item	number
New Yangon General Hospital		
Operation Theatre	13 items	48 pcs.
Intensive Care Unit	8 items	22 pcs.
Urology Unit	6 items	9 pcs.
Diagnostic Imaging	9 items	9 pcs.
Clinical Laboratory	9 items	11 pcs.
Medical Ward	9 items	28 pcs.
Surgical Ward	13 items	22 pcs.
Vehicles	0	0
	Sub:67 items	Sub: 149 pcs.
Yangon Central Women Hospital		
Operation Theatre	10 items	37 pcs.
Intensive Care Unit	7 items	21 pcs.
Neonatal Intensive Care Unit	11 items	46 pcs.
Diagnostic Imaging	4 items	7 pcs.
Clinical Pathology & Blood Bank	4 items	5 pcs.
	Sub:36 items	Sub: 116 pcs.
Yangon Children Hospital		
Operation Theatre	10 items	34 pcs.
Intensive Care Unit	5 items	12 pcs.
Neonatal Unit	6 items	24 pcs.
Diagnostic Imaging	3 items	3 pcs.
Clinical Laboratory	5 items	7 pcs.
	Sub:29 items	Sub: 80 pcs.
TOTAL	132 items	345 pcs

The responsible agency is the Ministry of Health in Myanmar, and the Department of Health under the aforesaid Ministry performs the actual work. The maintenance and management of the equipment after procurement are performed by the Central Medical

Supply Department (CMSD) affiliated to the Ministry of Health. The planned equipment, which can be operated and maintained under the current maintenance management system was selected. In cases except the above mentioned, the equipment that can be maintained by a local agent in Myanmar was selected. Therefore, it is deemed that no problem is to be occurred for the maintenance management after implementation of the project.

If this project is implemented by the Japan's Grant Aid, the work period required for implementation of this project is 4.0 months for the detailed design and the tender procedures and 6.4 months for the procurement of equipment, i.e. 10.4 months in total.

The radiation shielding work for the X-ray rooms of the Yangon Central Women Hospital and the Yangon Children Hospital should be undertaken by the Myanmar's side, and the expenses will be 6,663 thousand kyat.

After the implementation of this project, it becomes necessary to procure the spare parts and consumables for the operation of the medical equipment to be procured. According to the calculation of such operation and maintenance expenses, it would cost about 6.66 million yen in a year. These expenses correspond to about 0.648% of the budget of the Ministry of Health (the record of the year of 2001). The budget has increased at an annual rate of 50～60% for these 2 years. Even considering the annual inflation rate approximately 27% during 1996～1999, the budget has increased at a rate of over 20%.

Therefore, it is deemed that the increment of the operation and maintenance expenses due to procurement of the equipment is within the range that can be covered by the Myanmar's side.

The following effects and results are expected by implementation of this project.

(1) In the New Yangon General Hospital, the improvement of the medical equipment enables to provide annually about 700 serious patients (the year of 2000) with proper, prompt and cheap medical services. This hospital is a teaching hospital for the Yangon Medical University, and improvement of the equipment enables to provide the effective medical trainings to approximately 500 medical students.

(2) In the Yangon Central Women Hospital, the improvement shall be made for the medical equipment relevant to the obstetrics and gynecology, which is too old and insufficient in quantity. Accordingly, the medical services of high quality shall be provided to approximately 27,000 patients with serious obstetric or gynecologic disease in a year and approximately 4,500 immature babies in a year.

(3) In the Yangon Children Hospital, the improvement shall be made for the medical equipment relevant to the obstetrics and gynecology, which is too old and insufficient in quantity. Accordingly, the medical services of high quality shall be provided to approximately 2,000 patients with serious infantile disease in a year.

(4) The improvement of equipment shall contribute to the enhancement of medical welfare for the residents (approximately 5 million people) of the Lower Burmese area, where the residents may be able to attend each project hospital.

(5) The improvement of equipment shall contribute for raising the quality of medical care and inspection, and for restoring the reliance of the patients to the hospitals.

In order to make this project more effective, it is important to improve and prepare for the following points.

(1) This project is to supply the medical equipment that is now deficient, and to support improvement of the health and medical situation in Myanmar from the hardware (equipment) side. However, it is indispensable to make arrangements on the soft side by Myanmar, such as the solution of deficiency of the medical personnel (especially the medical doctors) and the improvement of quality of medical services. Moreover, it is urgently necessary to promote the residents' understanding of the health and medical care and to establish such a medical system that does not cost too much by early diagnosis and early therapy.

(2) In order to make the effect and the problems of this project clear, the Myanmar's

side is required to submit the management and activity report to the Japan's side in every 4 months on the performance of each project section, the operating state of the equipment, and the conditions of the maintenance contract for the major equipment.

(3) The Ministry of Health is planning an organizational restructuring, such as reorganization of the Maintenance Department under the Central Medical Supply Department as the Biomedical Engineering Department, and increase of the technologists and engineers. In order to use the equipment to be procured in this project more effectively over a long period of time, early establishment of the Biomedical Engineering Department is required.

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Chapter 1. Background of the Project

Chapter 1 Background of the Project

1-1 Background, circumstances and purpose of the request

In the Union of Myanmar (hereinafter referred to as "Myanmar"), the standard of the medical services has declined in general and special hospitals, which are superordinate in the medical system of Myanmar, due to the old and malfunctioning equipment and so on. Therefore, even people of lower-income class have no choice but to depend on private medical facilities where patients have to bear the high medical expenses. Under such circumstances, Myanmar has aimed at the improvement of the medical service system and the restoration of the referral system in alignment with "the Improvement Plan of the Medical Facilities (improvement of the medical facilities both in quality and quantity)", which is one of the basic programs of "the National Health Plan". And, the improvement plan was elaborated for the main three (3) hospitals in Yangon city (the New Yangon Hospital, the Yangon Children Hospital, and the Yangon Central Women Hospital). The Government of Myanmar made a request to Japan for a grant aid.

1-2 Outline of the request

The request was made for improvement of the equipment in one (1) general hospital and two (2) special hospitals, which are located in Yangon city. The major requested equipment of each project facility is mentioned hereunder.

A. New Yangon General Hospital

Operation Table, Ceiling Lamp (Combination Type), Bedside Monitor, Arterial Blood Gas Analyzer, Whole Body Computed Tomographic, Doppler Ultrasound Scanner, Digital Subtraction Angiography, Portable X-Ray Machine, Diagnostic X-Ray System with TV, Defibrillator, Gastrointestinal Fiberscope Unit, Monitoring System, Duodenoscope Unit, Bronchofiberscope Unit

B. Yangon Central Women Hospital

ICU Ventilator, Oxygen Flowmeter Set, Portable X-Ray Unit, Intensive Care Warmer,

Continuous Positive Airway Pressure, Infant Incubator, Ultrasound Scanner, Diagnostic X-Ray System, Portable Ultrasound Scanner, Spectrophotometer

C. Yangon Children Hospital

Universal Operating Table, Autoclave, Anaesthesia Apparatus, Bedside Monitor, ICU Ventilator for Paediatric, Infant Incubator, Diagnostic X-Ray System with TV & Simple X-Ray, Ultrasound Scanner, Refrigerated Centrifuge

Chapter 2. Contents of the Project

Chapter 2 Contents of the Project

2-1 Basic Concept Of The Project

2-1-1 Aims of upper-rank projects and aims of this project

The Ministry of Health settled on "the Third National Health Plan 1996-2001". And the following six (6) basic programs have been carried out; 1) the improvement plan of the community health, 2) the countermeasures to diseases, 3) the improvement plan of medical facilities, 4) the improvement plan of environmental health, 5) the development plan of health service system, 6) the improvement plan of organizational control system. The forty-seven (47) concrete goals were established under the above six (6) program, including the reduction of neonatal mortality and maternal mortality and the enrichment of the advanced medical services. The above National Plan has been instituted so as to attain these goals, however, the accomplishment of this National Plan has been delayed due to the technical difficulties and the chronic shortage of medical equipment from tight financial conditions.

Moreover, patients become to go to private hospitals in reaction to the introduction of the cost-sharing system to the advanced medical care, and such patients have been increasing.

In order to improve such situation, the Government of Myanmar is strongly promoting the improvement plan of medical facilities as a basic program of the above National Plan. This project aims at quantitative and qualitative enhancement of the medical services at the top referral hospitals of the entire country, from Yangon and Mandalay down. These aims are succeeded to "the Forth National Health Plan 2002-2006".

2-1-2 Outline of the project

The medical equipment shall be supplied to the New Yangon General Hospital, the Yangon Central Women Hospital, and the Yangon Children Hospital, which are the top referral hospitals in Myanmar. In order to attain the goals of the upper-rank project as above-mentioned, this project shall be implemented aiming at renewal of old and malfunctioning equipment in the public medical institutions in the cities such as Yangon, Mandalay, and Magwe. It also aims at provision of medical services of good quality.

Accordingly, reliance to the public medical institutions can be restored with

increase of the lifesaving ratio and the therapeutic ratio by recovering the medical functions of the project facilities.

2-2 Basic Design of the Requested Japanese Assistance

2-2-1 Design Policy

Each project facility is ranked as a top referral hospital among the general hospitals, the women hospitals, and the children hospitals. However, the renewal of medical equipment has not been made for a long time due to the financial difficulties and so on. The equipment in these hospitals has been impoverished and its functions are remarkably declining. It causes troubles in extending the daily medical services. The patients have to wait for consultation for a long time, and they cannot get a proper diagnosis and enough treatment. Under such situation, patients tend to go to the private hospitals where they can receive more satisfactory services, and reliance of the patients to the designated facilities has lessened.

This project aims at improving such conditions to the previous level, and the Japanese side replenishes the equipment of the project facilities that is old for use and insufficient in quality or quantity. This can contribute to the increase of the patients to visit the designated hospitals and the increase of medical examinations there. This project is settled in accordance with the following policies.

(1) Basic policy

The New Yangon General Hospital

This hospital is a medical facility which renders the medical care centering on services at the third medical level. A patient, who is deemed difficult to have examination in a low-ranking medical facility, is finally transferred to this hospital as a top referral hospital. As this is also an educational hospital for medical students, the Myanmar people rely on this hospital. The procurement of equipment was made for this hospital under "the construction plan of the general hospital" of 1981. However, almost equipment is too old for use, and renewal of the equipment is required. The Myanmar side has continued procurement of the equipment, which is not expensive and can be obtained by self-efforts, and it is

deemed that they shall keep such stance hereinafter. Therefore, this project aims at procuring the equipment stated below and securing the function as a top referral hospital, which extends the medical services according to the design policy of the assistance of 1981. The procurement shall be made for 1) the equipment that is indispensable for the specialized medical activities in this hospital, and 2) the equipment that is expensive and difficult to procure by self-efforts.

The Yangon Central Women Hospital

This hospital provides medical services such as physical examination and treatment in the gynecology, obstetric, and neonatal departments. This is also an educational hospital for the medical personnel. The big problem of this hospital is less quality of medical care due to old equipment for use. For almost equipment, it has been fifteen (15) years or more since its procurement. The major equipment indispensable for the activities of this hospital, such as X-ray unit and infant incubator, is frequently in trouble, and it disturbs the daily medical activities.

Therefore, the lifesaving ratio for pregnant women and neonates has decreased. The reliance of the patients to this hospital is wavering under such situation. Actually, the patients who visit this hospital have been decreasing at about 20 ～30% for the last several years. Many of these patients are deemed to go to private hospitals, which are comparatively well equipped. This hospital has promoted introduction of the cost-sharing system such as paybed and medical care on self-account, and keeps working to secure the funds for purchase of equipment and the operating funds of this facility. However, there is a limit to these earnings. While this is a big hospital with eight hundred (800) beds, the equipment that is for only several percent of those beds has been procured.

Based on such situation, this project is deliberated aiming at increase of the lifesaving ratio for pregnant women and neonates and the functional restoration as a top referral hospital for the maternal and child health and medical care. And, it shall contribute to restore the reliance of patients to this hospital.

The Yangon Children Hospital

This is a top referral hospital, which extends medical examination and treatment to neonates and infants, and also an educational hospital for the medical personnel.

Serious cases have been transferred from hospitals all over the country to this top referral hospital. However, most of the existing equipment is too old for use, and some of them are no longer serviceable. This disturbs the provision of the proper medical services and brings about decrease of the lifesaving ratio in this hospital. Under such circumstances, even patients in the lower-income class demand high-quality medical services and visit private medical facilities, which are rather well equipped.

This hospital keeps working for securing the operating funds through the cost sharing for the medical care, the contribution from the civilian, and the set-up of trust fund. This hospital is putting a great deal of efforts into provision of the medical equipment. Because of financial difficulties, however, this hospital cannot afford to procure the expensive medical equipment, such as X-ray unit, ventilator, operating table, and incubator. By procuring the equipment indispensable for the medical services to neonates and infants in this project, it may enable this hospital to recover the function as a top referral hospital and to restore the reliance of patients to this facility.

(2) Design policy for selection of equipment

[Design policy on demand]

1. The planned equipment shall be used for diagnosis and treatment of the diseases, and shall not be used for research.
2. The planned equipment shall be renewal or supplementation of the existing equipment that is too old for practical use.

[Design policy on technical aspects]

1. The planned equipment shall not require training for any special medical technicians, and can be operated and maintained at the current technical level of the existing personnel with current human resources.

[Design policy on financial analysis]

1. The operational costs after procurement of the planned equipment shall be comparatively low so that each project facility can financially maintain them.
2. The scale of the project shall be within the scope that the expenses to operate and maintain the planned equipment can be covered with the current equipment

operational budget. In case the operational costs of the planned equipment are deemed to drastically exceed the budget as a result of the financial analysis (considering the economic growth rate, the price increasing rate, the rate of budgetary increase, etc.), the equipment plan shall be cut back to the range that the Myanmar side can bear these costs.

3. The scale of the project shall be within the scope of which can be operated by the administrative capacity of each facility and where their financial and technical sustainability is secured. (If the equipment requires large sums in supply of consumables after implementation of this project, the procurement is not made for such equipment.)

[Design policy for infrastructure and natural conditions]

1. The planned equipment shall have performances sufficiently resistant to the hot humid climate of this country.
2. The disposition of the uninterruptible power supply (UPS) shall be planned for the equipment such as CT scanner that requires continuous and stable power supply in service. The UPS enables the equipment to be operated even at a power failure or a drop in electric power. Accordingly, the electric circuits of the equipment can be protected from the power fluctuation.
3. As for the electric medical equipment such as microscope, the disposition of the auto voltage regulator (AVR) workable within voltage fluctuations of ± 15%, or procurement of the high-voltage and high-current breaker, shall be planned.
4. In order to avoid influences of water quality on the equipment, a water softener shall be planned to the equipment according to the hardness of supplied water.

(3) Design policy for equipment plan and work period

1. The work period for the project shall be within one (1) fiscal term that is 10.4 months after conclusion of the Exchange of Notes (E/N).
2. As for the planned equipment that requires procurement of consumables for its operation after implementation of the project, the minimum quantity of consumables (it takes 3～6 months from order to delivery) shall be supplied.
3. The procurement of equipment from a third country can be considered, after due deliberation if the medical technicians in the region are familiar with

operation of the equipment, if the maintenance system by a local agent can be secured, and if the competing principle can be expected.

(4) Design policy on operation and maintenance

1. As for the expensive medical equipment such as X-ray unit, the procurement shall be made for such equipment that can be sufficiently covered with the maintenance and control capability currently available in Myanmar such as a local agent of the equipment manufacture, and the Central Medical Supply Department of the Ministry of Health.
2. As for the expensive medical equipment such as X-ray unit, the procurement shall be made on the premise that the Ministry of Health enters into a maintenance contract with a local agent of the equipment manufacturer. The Myanmar side is required to prepare the budget for these expenses.
3. On the occasion of delivery and installation of the equipment, the guidance shall be made on the equipment operation and the daily maintenance to the responsible persons of each project facility for its handling and the engineers of the Maintenance Department of the Ministry. As for the main equipment such as X-ray unit, diagnostic imaging apparatus, and autoclave, a sales engineer of the equipment manufacturer or its local agent shall make the guidance on the equipment operation and maintenance.
4. The indication on the front side (control board) of the equipment and the operation manual shall be presented in English. The operating procedures in English should be supplied especially for the equipment that accurate indication is necessary on it's handling, such as X-ray unit, gamma camera, incubator, autoclave, and ultrasound machine. The operating procedures should be preserved in a case and attached to the equipment.

2-2-2 Basic Plan

2-2-2-1 Overall plan

1. Examination of the requested equipment

(1) The New Yangon General Hospital

The request for the procurement was made from the eight (8) sections of this hospital, for the equipment of the Operation Theatre, the Incentive Care Unit, the Urology, the Diagnostic Imaging, the Laboratory, the Medical Ward, the Surgical

Ward, and the Vehicle.

1) The Equipment for the Operation Theatres (4 rooms in total)

This hospital has four (4) operation theatres, however, most of the equipment is too old for use. Some equipment is used elastically among the various operations. While some of the existing equipment, which is comparatively functioning, shall be continuously used, it is difficult to use continuously. The function of this section shall be improved by renewal of the equipment for four (4) operation theatres in this project.

G1-1 Operating Table

(Priority: A / Requested Quantity: 5) Procurement: 4

The operating table originally has function of height control and tilting function, and it can secure a suitable position of patient for operation. However, the existing unit has lost such function due to aging degradation. The improvement shall be made for 4 operation theatres in this project, and 4 units are to be renewed.

G1-2 Pulse Oximeter

(Priority: A / Requested Quantity: 4) Procurement: 0

This equipment consecutively performs nonsurgical monitoring of the respiration of a patient without drawing blood, and is indispensable for the operation theatre. This is fundamental equipment for monitoring respiration of the patient such as whom in the operation or whom in emergency. The procurement of the bedside monitor with pulse oximeter shall be made in this project, therefore, this equipment shall not be procured.

G1-4 Diathermy (Bipolar)

(Priority: A / Requested Quantity: 4) Procurement: 4

This equipment submits to a hemostatic incision and coagulation for a patient in the operation. 1 unit is now disposed in each operation theatre. However, 3 units are out of order and another is used with repairing. The procurement shall be made for the 4 operation theatres in this project, and 4 old units are to be renewed.

G1-5 Anaesthetic Ventilator

(Priority: A / Requested Quantity: 4) Procurement: 0

This equipment submits to the respiratory assistance to a patient in general anaesthesia, and is used with anaesthetic apparatus (Item No. G1-9). However, this equipment shall not be procured since the renewal is made for 5 units of the anaesthetic apparatus with ventilatory function as follows.

G1-7 Hot Air Sterilizer

(Priority: A / Requested Quantity: 1) Procurement: 0

This equipment is substituted with the tabletop sterilizer which is procured in this project, and therefore it is excluded from the procurement plan.

G1-8 Ceiling Lamp

(Priority: A / Requested Quantity: 5) Procurement: 4

Each operation theatre has 1 unit of ceiling lamp. However, 3 units have problems in positioning of the subsidiary illumination and focusing of the light. Another 1 unit is the old model and it is difficult to change valve. The renewal shall be made for these units in this project.

G1-9 Anaesthetic Apparatus

(Priority: A / Requested Quantity: 5) Procurement: 5

Each operation theatre has 1 anaesthetic apparatus. They were procured in the Japan's Grant Aid project in 1984. While they are still used, they are frequently in trouble because they have been submitted to the service for 15 years or more. This equipment is indispensable for the major operation. The renewal shall be made for 4 units in the 4 operation theatres. And, 1 unit shall be supplemented for the recovery room.

G1-10 Bedside Monitor

(Priority: A / Requested Quantity: 5) Procurement: 5

This is important equipment to grasp the condition of a patient in and after the operation, and which submits to monitoring of the change of electrocardiogram, respiratory rate, pulse rate, and body temperature. While 2 units are now

disposed for the operation theatres, they are too old for use. Procurement shall be made for 5 units in total, which are renewal of these 2 units and supplementation of 3 units that is insufficient in quantity.

G1-11 Suction Unit

(Priority: A / Requested Quantity: 10) Procurement: 5

It is used to eliminate the blood, pus, washing liquid and other secretion for a patient in the operation. 2 suction units made in China were newly supplied and are now disposed in the recovery room, but several units disposed in the operation theatres were all procured by the Grant Aid of 1984. They are used with repairing, and urgent renewal is required for these units. While the quantity in request is 10 units for the entire hospital, renewal shall be made for 1 unit for each operation theatre and supplementation shall be made for 1 unit for the recovery room in this project.

G1-12 Infusion Pump

(Priority: A / Requested Quantity: 3) Procurement: 5

It is used to continuously infuse a liquid medicine with strong chemical action into a patient at a constant speed within the set time. This equipment is indispensable for the precise infusion control for the serious patient or the infant patient. This hospital possesses 2～3 units in the ICU, but there is no infusion pump for the operation theatres. In order to secure a minimum function of the medical service in this hospital, 5 units shall be totally procured to the 4 operation theatres and the recovery room.

G1-13 Syringe Pump

(Priority: A / Requested Quantity: 1) Procurement: 2

It is used to continuously syringe a liquid medicine with strong chemical action in a small quantity into a patient at a constant speed within the set time. This equipment is indispensable for the precise infusion control for the serious patient or the infant patient. This hospital possesses 1 unit only in the ICU, but there is no syringe pump for the operation theatres. As this equipment is used for many hours, several units are needed in case a few operations are conducted at the same time. While the requested quantity is

1 unit, the immediate procurement shall be made for a minimum of 2 units.

G1-14 Defibrillator

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to give the percutaneous countershock for the ventricular fibrillation and to restore the original rhythm of the heartbeat. This is indispensable for resuscitation in case of cardiac arrest. While the only 1 old unit is now disposed for the operation theatres, it is often in trouble and cannot be used in emergency. In this project, procurement shall be made for 1 unit as a renewal of the existing equipment and 1 unit as equipment for the time when another patient simultaneously requires treatment by defibrillator.

G1-15 Cardiograph

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to diagnose an arrhythmia or an ischemic heart disease, and it is important equipment in the function test for circulatory organ and physiology. 2 units, which are too old for use, shall be renewed in this project.

G1-16 Table Top Sterilizer

(Priority: A / Requested Quantity: 5) Procurement: 3

It is disposed in the operating preparation room, and used for the sterilization of the surgery tools that urgent sterilization is necessary. While this is indispensable equipment to prevent the nosocomial infection, the existing equipment is old and unfit for use. Therefore, 3 units shall be renewed.

G1-17 Instrument Sterilizer

(Priority: A / Requested Quantity: 6) Procurement: 6

6 instrument sterilizers (medium size) of pedal-type are disposed in the area of operation theatres. While only 2 units are barely fit for use among them, they are also old and in bad condition. Accordingly, 6 units shall be renewed in this project.

2) The Equipment for the ICU Section

This hospital has eight (8) beds in the ICU section. The Grant Aid submitted in 1984 procured the bedside monitors for the central control system. However, this system is old and not working. A bedside monitor is now used individually for each patient.

G2-1 ICU Ventilator

(Priority: A / Requested Quantity: 4) Procurement: 4

This is basic equipment, which submits to the respiratory control of the patient who requires mandatory ventilation, or who can breathe by himself but requires assisted ventilation. While this ICU section has 3 units of ventilators, 2 units cannot be repaired any more and 1 unit is borrowed from other hospital. In consideration of the monthly average number of patients (35～55 patients), the requested quantity is deemed appropriate. Renewal shall be made for 2 units and supplementation shall be made for 2 units.

G2-2 Suction Unit

(Priority: A / Requested Quantity: 4) Procurement: 4

It is used to suck the secretion and pus from the postoperative wound, vomit and secretion inside the oral cavity and the throat, and secretion and blood inside the trachea. 4 units are now disposed, but they are old and frequently in trouble. In this project, procurement shall be made for 1 unit to every 2 beds, i.e. 4 units to 8 beds.

G2-3 Cardiograph

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to diagnose an arrhythmia or an ischemic heart disease, and it is important equipment in the function test for circulatory organ and physiology. In this project, procurement shall be made for 2 units in total, i.e. 1 unit in each of ICU and CCU (the Coronary Care Unit).

G2-9 Pulse Oximeter

(Priority: A / Requested Quantity: 4) Procurement: 0

This equipment consecutively performs nonsurgical monitoring of the

respiration of a patient without drawing blood. This is fundamental equipment to monitor the respiration of the patient such as whom in the operation or whom in emergency. The procurement of the bedside monitor with pulse oximeter shall be made in this project, therefore, this equipment shall not be procured.

G2-13 Defibrillator with Synchronization

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment is used to give the percutaneous countershock for the ventricular fibrillation and to restore the original rhythm of the heartbeat. This is indispensable for resuscitation in case of cardiac arrest. While 2 old unit are now disposed in this ICU section, the functional decline is remarkable. Procurement shall be made for 1 unit to ICU and 1 unit to CCU.

G2-14 Bedside Monitor

(Priority: A / Requested Quantity: 4) Procurement: 6

The Grant Aid submitted in 1984 procured the bedside monitors for the central control system for 8 beds, but they are too old and not properly functioning. While these bedside monitors are now used individually for each patient, the 5 existing units are not in a good condition. While the request was made for 4 units, it is important to enhance the patient monitoring system at ICU. Therefore, procurement shall be made for 6 units, i.e. 5 units for renewal and 1 unit for supplementation.

G2-15 Oxygen Concentrator

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to supply oxygen to the patients of hypoxemia such as pulmonary tubercular sequela, chronic pulmonary emphysema, chronic bronchitis, and bronchial asthma. While the oxygen supply was made through the central piping system so far, supply through this system has become difficult due to the decrepit facilities. Therefore, this ICU section has to extend treatment with this unit individually for each patient. In this project, procurement shall be made for 2 units to 8 beds on the assumption that this equipment is required for 1 unit to 4 beds.

3) The Equipment for the Urology Department

G3-1 Electrosurgical Unit with Patient Plate

(Priority: B / Requested Quantity: 2) Procurement: 1

It is used for incision and coagulation of the patient's tissue and so on, by handwork under the rigid scope (endoscope). This equipment submits to the surgical operation of the urinary organs, and it contributes to the reduction of burden to the patient. There is no technical problem to manipulate this equipment, because this hospital is the third medical facility. The request was made for the supply of 2 units. Considering that the operation is performed for 3～4 cases a week, it is judged appropriate to procure 1 unit in this project.

G3-2 Video System

(Priority: B / Requested Quantity: 1) Procurement: 0

This system is used to record the contents of diagnosis with the fiberscope and the rigid scope on videotape. This hospital is a medical facility that provides education to the medical personnel and the medical students, therefore, this system is necessary and very useful. It can be expected technical improvement in the clinical field by procurement of the video system, and the priority is high. However, this equipment shall be procured to the Surgical Ward in this project, and it is advisable to share such equipment with the Urology department.

G3-4 Pharmaceutical Refrigerator

(Priority: B / Requested Quantity: 1) Procurement: 1

While 1 pharmaceutical refrigerator is working, this is remarkably old and frequently in failure. Renewal of 1 unit is deemed necessary.

G3-5 Table Top Sterilizer

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment does sterilization of the small medical tools. It is important equipment that is indispensable for the daily medical activities. Procurement shall be made for 2 units as a renewal of the old existing equipment.

G3-6 Suction Unit

(Priority: A / Requested Quantity: 2) Procurement: 2

No suction unit usable is now disposed in the Urology department. The hospital ward with 40 beds is divided into 2 wards, the ward for men and the ward for women. It is judged appropriate to procure 1 unit in each ward. Therefore, 2 units shall be procured.

G3-7 Defibrillator

(Priority: B / Requested Quantity: 1) Procurement: 0

It is judged that this equipment is rarely used in this hospital ward. If necessary, a defibrillator disposed in other sections can be shared with this ward. This equipment shall not be procured.

G3-10 Instrument Sterilizer

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment does sterilization of the small tools used for diagnosis and treatment of patients. It is important equipment that is indispensable for the daily medical activities. Sterilization is now made by boiling with a general electric heater. It is necessary to procure respectively 1 unit in the ward for men and the ward for women, i.e. 2 units in total.

4) The Equipment for Diagnostic Imaging

G4-1 Whole Body Computed Tomographic

(Priority: A / Requested Quantity: 1) Procurement: 1

This equipment was supplied under the Japan's Grant Aid in 1986.

The CT scan has been made approximately 2,500～3,000 times per annum for the past 16 years. Scanning is made to contribute to the early diagnosis of disease on the specific parts such as head, chest, abdomen, kidney and liver. However, the model of the existing equipment scans wide focus and the resolving power is low, and it is difficult in diagnosing the narrow focus. Moreover, the heat unit storage capacity of the X-ray tube is too small, so continual diagnosis of patients cannot be made, and the number of patients who have CT scanning for a day is restricted.

The Myanmar side completed the fourth exchange of the X-ray tube in the

own fund from the procurement of this equipment, and it has restored to the practicable condition. After consideration of the years this equipment has served, no further utilization of this equipment can be accepted in the viewpoint of the durability of the spare X-ray tube for the next exchange (3～4 years later) and the supply of spare parts. In these circumstances, renewal of the equipment is indispensable, and the procurement is deemed to bring good results.

Table 2-1 Contents and Number of CT Scans

	Annual Average 1990-1998	1999	2000	2001
Head	1,200	266	1,007	
Chest	240	26	84	No examination due to X-ray tube's failure.
Abdomen	880	347	847	
Pelvis	10	0	5	Under repair.
Other Focuses	170	33	65	
TOTAL	2,500	672	2,008	0

* This equipment had been refrained from its use for 3-4 months in 1999 in order to take steps to the Y2K problem. Accordingly, the number of times of CT scanning was decreased.

The advantage by renewal of the equipment:

① It enables to make an examination in further detail from high resolving power.

② It enables to scan at high velocity, and increase of the number of CT scans for a day can be expected.

③ It enables to scan at high velocity, and the burden on the patients can be reduced by the reduction in examination hours.

④ It enables to process the images by computer, and X-ray films can be reduced.

G4-2 Doppler Ultrasound Scanner

(Priority: B / Requested Quantity: 1) Procurement: 1

The ultrasound scanner examines various regions such as circulatory organ, abdomen and body surface. This equipment is economical and easy to operate. It is important equipment which enables to make a diagnosis of the biomedical picture with noninvasive and less burden to the patient. This hospital possesses the equipment manufactured in Japan in 1984, however, the image quality has been remarkably deteriorating due to aging. The existing equipment is not a model with doppler function. The renewal of this equipment is deemed

appropriate, since there are many patients to whom blood flow measurement is required and there is no problem in diagnostic technique of the present personnel. Therefore, 1 unit of this equipment shall be procured in this project.

G4-3 Digital Subtraction Angiography

(Priority: B / Requested Quantity: 1) Procurement: 1

The Japan's Grant Aid supplied the X-ray angiography in 1986, and the function has been declining due to the aging degradation. This equipment is used with catheter for treatment of diseases such as cancer. It is used to make a treatment for vascular occlusion of liver and kidney, and to make a diagnosis of vascular disorder of carotid, cardiovascular, kidney, aortae, and appendicular blood vessels. From 1996 to 1998, it was reported that approximately 200 cases annually received treatment for vascular occlusion, and that approximately 270 cases annually received diagnosis of vascular disorder. However, the cases of treatment and the cases of diagnosis have respectively decreased to a half due to the malfunction of the equipment since 1999. While the equipment has been repaired many times, the spare parts necessary for the repair cannot be supplied recently due to discontinuance of manufacturing. The synchro-geared motor of the patient bed (catheter couch) is in failure, therefore, a string is tied to the edge of the bed and the bed is moved at eye-estimation. Accordingly, the images have been blurred, and it disturbs to make a proper diagnosis. Moreover, the clear image cannot be obtained due to aging degradation of X-ray tube, image intensifying tube, CCD camera, and image processing circuit. The percutaneous insertion of catheter is made by depending on intuition and without confirmation of the position of the tip of catheter for the interventional radiology. It may cause malpractice.

There are many patients at this hospital to which diagnosis and treatment with this equipment are required. From a viewpoint of the medical morals, it is mandatory to provide proper diagnosis and treatment with the equipment in good condition. Accordingly, it is deemed necessary to renew this equipment.

Tabel 2-2 Number of Diagnoses and Treatments with X-ray Angiography

	1996-1998 Average	1999	2000	2001 (as of Nov)
Treatment for Vascular Occlusion	205	195	187	189
Liver	165	180	182	177
Kidney	20	12	4	10
Others	20	3	1	2
Diagnosis on Vascular Disorder	277	48	49	37
Carotid	38	0	2	0
Heart	70	0	-	0
Kidney	86	24	29	29
Aortae	50	12	10	0
Appendicular Blood Vessels	33	12	8	8
TOTAL	482	243	236	226

The equipment belonging to the Yangon General Hospital has been used for some treatments for hepatic vascular occlusion since 1999.

The advantage by renewal of the equipment

① It enables to make proper treatment by fulfilling the original function.

② It enables to extend medical care with precision.

③ It enables to reduce the expenses for supplying films to 1/10 of the existing model or below, since only the necessary images are printed on the X-ray films.

④ It enables to reduce the financial burden on the patients for the film expenses.

⑤ It enables to restore the number of inspections in the previous level before 1998.

G4-4 Portable X-ray Machine

(Priority: A / Requested Quantity: 2) Procurement: 1

It is used for a serious case that is difficult to move to the X-ray room from his bed. The existing equipment is frequently in trouble due to aging degradation. The request was made for the procurement of 2 units. It is deemed that the procurement of 1 unit is enough, since this hospital is comparatively small-scale with 200 beds.

G4-7 Diagnostic X-ray System with TV

(Priority: A / Requested Quantity: 1) Procurement: 1

As for this equipment, this section has 2 units. 1 unit is out of order, and the other is frequently in trouble and malfunctioning because 15 years have been passed since the installation. This equipment is used to make a diagnosis only through the fluoroscope, and it enables to reduce the expenses for supplying films in comparison with the X-ray unit that requires films for radiography. The procurement is planned in this project for 1 unit of X-ray system of a proximate operation method, which facilitates communication between the doctor and the patient.

G4-8 X-ray Film Processor

(Priority: A / Requested Quantity: 2) Procurement: 1

This equipment automatically develops the films radiographed with the X-ray unit. This hospital possesses 1 unit of X-ray film processor (procured in 1984), but the function has decreased due to aging degradation. The request was made for procurement of 2 units. The radiograph is made less than 50 exposures a day in this hospital, therefore, the procurement of 1 unit shall be made as a renewal of the existing equipment.

G4-10 C-arm X-ray Unit with TV

(Priority: B / Requested Quantity: 1) Procurement: 1

This equipment was procured in the Japan's Grant Aid project of 1984, but it is out of order. The availability of this equipment is not so high. Considering that this hospital is a third medical facility in the Yangon metropolitan area, it is deemed that renewal of this equipment is necessary in this project.

G4-12 Gamma Camera Set

(Priority: B / Requested Quantity: 1) Procurement: 1

The Japan’s Grant Aid provided the gamma camera set and the peripheral equipment in the nuclear medical examination room in 1986. The inspection was made for approximately 4,000 cases in the year of 2000.

This examination room is also functioning as an examination room in the

cardiac function test section and the cancer section of the Yangon General Hospital, which is ranked as the only institution for nuclear medical test.

This equipment monitors the circulatory and metabolic function of the organs, such as thyroid gland, liver, kidney and heart, by temporally tracking the internal movement of the radiopharmaceutical. It is the main equipment for making a diagnosis of diseases through the nuclear medical test. It is also indispensable equipment for inspection of the difficult sites of diagnosis by the extracorporeal radioparency with X-ray unit and CT scan.

This equipment is used somehow despite malfunctioning. It cannot escape from being completely beyond working order within 2～4 years, considering the durable years.

This examination room is the only institution in Myanmar where the nuclear medical test is made with the gamma camera, and more than 4,000 patients annually have the nuclear medical test in this hospital. If the function of this examination room is recovered in the future, increase of the patients can be expected. Therefore, the great benefit can be expected by renewal of this equipment.

Table 2-3 Contents and Number of Examinations in Nuclear Medical Examination Room

Year of 2000

Gamma Camera		
	Thyroid Gland	1,671 per annum
	Liver	203 per annum
	Kidney	187 per annum
	Kidney Function Test	1,215 per annum
	Bone	560 per annum
	Heart	40 per annum
	Chest	80 per annum
	Head	30 per annum
Radioimmunoassay		
	Thyroid Gland	5,580 per annum

Source: New Yangon General Hospital

The advantage by renewal of the equipment

① It enables to ensure the necessary images of 4 exposures for diagnosis.

② It enables to make a proper diagnosis with the clear images.

③ It can be expected to increase the patients who have the nuclear medical test by recovery of the function.

5) The Equipment for the Laboratory

G5-1 Biochemistry Analyzer

(Priority: B / Requested Quantity: 1) Procurement: 0

As for the blood test and biochemical examination in the laboratory, most of those examinations are made manually. If the examination is made for 10 ～20 test bodies a day on average, it is believed that the introduction of the new analyzer of the automatic type is not necessary. Therefore, procurement of this equipment in this plan is put off. The spectrophotometer, which enables biochemical inspection with semi-automatic system, shall be alternately procured.

G5-2 Blood Cell Counter

(Priority: B / Requested Quantity: 1) Procurement: 0

It is excluded from the procurement plan, since this request seems to overlap with the others.

G5-5 Coagulation Analyzer

(Priority: B / Requested Quantity: 1) Procurement: 0

There are not many test bodies for the blood coagulation test, and the procurement of the analyzer is not necessary. As for the inspection items that cannot be made manually, the collaboration should be sought to the National Health Laboratory affiliated to the Ministry of Health as before.

G5-6 Auto Still Apparatus

(Priority: A / Requested Quantity: 2) Procurement: 2

The usage frequency of the distilled water and the demineralized water is high for the dilution of the reagent and so on in the laboratory. This equipment is for common use with many other sections, and the versatility is also high. Both the existing units of the old model are out of order. The current equipment is used as a substitute. It is small-sized and the productive capacity for the distilled water is poor. The prompt renewal is required. The consumption of the distilled water is about 30 liters a day at the Laboratory, but the planned equipment is small-sized and distills water of 1.8 liters per hour and of 15 liters per day. Procurement shall be made for 2 units in this project

as requested.

G5-7 Adjustable Pipettes & Pipette Tips

(Priority: B / Requested Quantity: 1) Procurement: 0

The existing pipettes can be continuously used. The procurement is also comparatively easy by self-effort. While the priority is B, it is excluded from the procurement plan of this project.

G5-8 Automatic Chemistry Analyzer

(Priority: B / Requested Quantity: 1) Procurement: 0

As for the blood test and biochemical examination in the laboratory, most of those examinations are made manually. If the examination is made for 10～20 test bodies a day on average, it is believed that the introduction of the new analyzer of the automatic type is not necessary. Therefore, procurement of this equipment in this plan is put off.

G5-10 Blood Cell Counter

(Priority: B / Requested Quantity: 1) Procurement: 1

It is the counter that automatically counts the blood corpuscle, leucocyte, platelet, haemoglobin, hematocrit, and so on. The existing equipment is malfunctioning due to aging degradation, and therefore, the counting is now made by visual observation (computing is made by using a counting chamber under the microscope). The blood test is made for 30～50 cases a day on average, and it is difficult to make it by visual observation. Renewal of 1 unit is planned in this project.

G5-12 Microscope

(Priority: A / Requested Quantity: 2) Procurement: 2

It is fundamental equipment in the laboratory, and it is indispensable for the routine inspection such as urinalysis, blood test, and bacteriological examination. While 5 microscopes are now disposed, they are in such bad condition that the stage is not fixed. Procurement is planned for 2 units that are especially old among these 5 units, and this project aims at the enhancement of the inspection system.

G5-14 Microtome

(Priority: A / Requested Quantity: 1) Procurement: 0

The disposition of the new equipment was confirmed in the further study after the signature of the Minutes of Discussions, therefore, it is excluded from the procurement plan of this project.

G5-16 Pharmaceutical Refrigerator

(Priority: B / Requested Quantity: 1) Procurement: 1

While 1 existing pharmaceutical refrigerator is running, the capacity is small and it is too old for use. Therefore, procurement is planned for 1 unit in this project.

G5-17 Centrifuge

(Priority: A / Requested Quantity: 2) Procurement: 1

The centrifuge of the standard model enables to be for common use with other sections for the routine tests in the laboratory. The existing equipment is not functioning properly due to aging degradation, and the revolving speed cannot be gathered. Renewal is planned for 1 unit for the general inspection (urinalysis and blood test) in this project.

6) The Equipment for the Medical Ward

G6-1 Defibrillator

(Priority: A / Requested Quantity: 2) Procurement: 2

The hospitalization is extended at the Medical Ward, the Urological Ward and the Surgical Ward in this hospital. A defibrillator should be disposed in each hospital ward. While the entire hospital is now equipped with 4 units, 1～2 units are only available due to aging degradation and it is borrowed from other sections if necessary. Procurement shall be made for 2 units in this project, and these units are not restricted to the use in the Medical Ward but for common use in all the hospital wards.

G6-2 Cardiac Monitor

(Priority: B / Requested Quantity: 3) Procurement: 3

It is used to monitor the vital sign (such as electrocardiogram and heart rate) of the patient. There are many monitors in trouble due to aging degradation in this hospital, and it is absolutely insufficient in the number of working monitors. A monitor is not disposed in the Medical Ward, and it disturbs the medical care for the inpatients. While the priority is B, it is deemed necessary to procure 1 unit respectively for the ward for men, the ward for women and the ward for serious patients. 3 units in total shall be procured as requested.

G6-4 Oxygen Concentrator

(Priority: A / Requested Quantity: 2) Procurement: 6

While oxygen has been supplied with the central piping system hereto, it becomes difficult to supply oxygen with this system due to aging degradation of the installations. It is necessary to make immediate procurement of the unit that enables oxygen supply to the hypoxemia patients and so on. While the request was made for procurement of 2 units, procurement shall be made for 6 units in total, i.e. 1 unit respectively to the ward for men and the ward for women, and 4 units to the ward for serious patients.

G6-5 Infusion Pump

(Priority: A / Requested Quantity: 2) Procurement: 4

It is used to continuously infuse a liquid medicine with strong chemical action into a patient at the constant speed within the set time. This equipment is indispensable for the precise infusion control for the serious patient. This hospital is short of this equipment in quantity, therefore, it is not disposed in the Medical Ward. This equipment is necessary at the time of the medication to the patient. Procurement shall be made for 4 units in total, i.e. 1 unit respectively to the ward for men and the ward for women, and 2 units to the ward for serious patients.

G6-6 Syringe Pump

(Priority: A / Requested Quantity: 1) Procurement: 6

This equipment is indispensable for the precise infusion control for the

serious patient or the infant patient. This hospital is short of this equipment in quantity, therefore, it is not disposed in the Medical Ward. The medication has depended on eye-estimation and technique of the doctor. The requested quantity is 1 unit. Considering that this equipment is necessary and useful, procurement shall be made for 6 units in total, i.e. 1 unit respectively to the ward for men and the ward for women, and 4 units to the ward for serious patients.

G6-7 Pulse Oximeter

(Priority: A / Requested Quantity: 2) Procurement: 2

The Pulse Oximeter consecutively performs nonsurgical monitoring of the respiration of the patient without drawing blood.

This equipment is not disposed in this ward, and it is borrowed from the Operation Theatre if necessary. However, it cannot be coped in an emergency. The immediate supplementation is required. 2 units are now disposed in the entire hospital. Procurement is planned for 1 unit respectively to the ward for men and the ward for women.

G6-8 Spirometer

(Priority: A / Requested Quantity: 1) Procurement: 0

It was confirmed in the meeting between the hospital side and the Study Team that the priority of this equipment was lowered in the further study after the signature of the Minutes of Discussions. Therefore, it is excluded from the procurement plan of this project.

G6-9 Suction Unit

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to absorb the secretion and pus from the postoperative wound. Procurement shall be made for 2 units in the entire hospital ward of 76 beds in order to renew the existing but old equipment.

G6-10 Cardiograph

(Priority: A / Requested Quantity: 3) Procurement: 1

This ward possesses 1 old cardiograph. While it is necessary in this ward,

the necessity and the appropriateness are not approved for the quantity in demand (3 units). Therefore, it is kept for the renewal of the existing equipment, and the procurement is planned for 1 unit.

G6-11 Table Top Sterilizer

(Priority: B / Requested Quantity: 2) Procurement: 2

This equipment does sterilization of the small steal tools used for diagnosis and treatment of patients. It is important equipment that is indispensable for the daily medical activities. The main current of instrument sterilizer is the one with the electric heater. The renewal is planned for the existing equipment that is apt to break down, and the supplementation shall be made for 1 unit. It promotes the improvement of hygiene in this ward.

G6-13 Pharmaceutical Refrigerator

(Priority: B / Requested Quantity: 1) Procurement: 0

While the existing equipment is an old model, it is judged that continuous usage is possible. Therefore, it is excluded from the procurement plan of this project.

7) The Equipment for the Surgical Ward

G7-1 Gastrointestinal Fiberscope Unit

(Priority: A / Requested Quantity: 2) Procurement: 2

The fiberscope is in great demand for the inspection of the upper gastrointestinal tract (gullet, stomach and duodenum). This hospital makes the inspection for 5～6 patients a week on average, and sometimes for 10 patients in a week. While 3 units are disposed, some of fibers are torn due to degradation by the long use and the dark spots appear in the 5～8% of the view. Therefore, clear image cannot be obtained and it may cause misdiagnosis. Renewal is planned for 2 units urgently required, considering the number of patients who require the inspection by using a gastrointestinal fiberscope.

G7-2 Monitoring System

(Priority: A / Requested Quantity: 1) Procurement: 1

This equipment is used as a peripheral equipment of the above-mentioned

gastrointestinal fiberscope unit. The necessity of procurement is approved in a similar reason as G7-1. This monitoring system is shared with 2 fiberscope units.

G7-3 Duodenoscope Unit

(Priority: C / Requested Quantity: 2) Procurement: 1

This equipment was admitted as the priority C in the equipment evaluation in the signature of the Minutes of Discussions. In the further study, it is judged necessary to review procurement of this equipment. The equipment currently being used is not the property of this hospital but be rental. This hospital, which is a tertiary medical facility, practices diagnosis of diseases such as ulcer and cancer of the duodenum. It also practices the retrograde pancreatography and the retrograde cholangiography with endoscope. It is deemed indispensable to procure this equipment in order to continue practicing these inspections. Supplementation is planned for 1 unit of this equipment in this project.

G7-4 Bronchofiberscope Unit

(Priority: A / Requested Quantity: 2) Procurement: 1

The bronchofiberscope unit submits to the diagnosis of bronchopathy such as lung cancer and pulmonary tuberculosis. It also makes the detection and elimination of the endobronchial xenobiotic, and the endobronchial suction and lavage for the therapeutic purpose. It is necessary to urgently renew the existing equipment, since it has already exceeded the period of durability and it is frequently in trouble. Procurement of 1 unit is judged appropriate, considering the subjects of this inspection are 3～4 patients a week.

G7-5 Light Source for Fiberscope

(Priority: A / Requested Quantity: 3) Procurement: 3

It is indispensable related equipment at the time of the inspection and diagnosis by the fiberscope. Procurement shall be made for 1 unit each for the gastrointestinal fiberscope unit (G7-1), the duodenoscope unit (G7-3), and bronchofiberscope unit (G7-4).

G7-7 Pharmaceutical Refrigerator

(Priority: B / Requested Quantity: 1) Procurement: 1

While the existing refrigerator is working, it is too old for use and it is difficult to make a temperature control. Procurement of 1 unit is planned.

G7-8 Instrument Sterilizer

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment does sterilization of the small tools used for diagnosis and treatment of patients. It is important equipment that is indispensable for the daily medical activities. Sterilization is now made by boiling with a general electric heater. Since this equipment is frequently used, procurement is planned for 1 unit in each of the nurse stations, i.e. 2 units in total.

G7-9 Table Top Sterilizer

(Priority: A / Requested Quantity: 2) Procurement: 1

This equipment does sterilization of the forceps and other small steel tools used for diagnosis and treatment of patients. It is important equipment that is indispensable for daily medical activities. While the request was made for the supply of 2 units, it seems that the effective sterilization can be secured by procurement of 1 unit, considering the current activities and the number of beds (72).

G7-11 Cardiograph

(Priority: B / Requested Quantity: 1) Procurement: 0

Procurement shall be made for 1 unit to the Medical Ward in this project, and this unit is for common use in all the hospital wards. Therefore, procurement shall not be made for the Surgical Ward.

(See the Item No. G6-10 of the Equipment Examination List.)

G7-12 Suction Unit

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to absorb the secretion and pus from the postoperative wound. The suction contrivance of the central piping system, which has been functioning so far, is in trouble. Therefore, it is necessary to use the suction unit

individually. This ward consists of 36 beds for men and 36 beds for women. Therefore, procurement shall be made for 1 unit in each ward, i.e. 2 units in total.

G7-13 Syringe Pump

(Priority: A / Requested Quantity: 1) Procurement: 2

This equipment is indispensable for the precise infusion control for the serious patient or the infant patient. This hospital is short of this equipment in quantity, therefore, it is not disposed in the Surgical Ward. The medication has depended on eye-estimation and technique of the doctor. The requested quantity is 1 unit. Considering that this equipment is necessary and useful, procurement shall be made for 2 units in total, i.e. 1 unit respectively to the ward for men and the ward for women.

G7-14 Infusion Pump

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to continuously infuse a liquid medicine with strong chemical action into a patient at a constant speed within a set time. This equipment is indispensable for the precise infusion control for the serious patient. It is not disposed in the Surgical Ward, and it is borrowed from other sections when necessary. The necessity of this equipment is high, and procurement shall be made for 2 units in total, i.e. 1 unit respectively to the ward for men and the ward for women.

G7-15 Bedside Monitor

(Priority: A / Requested Quantity: 2) Procurement: 2

As the needs arises with a turn for the worse in the postoperative condition of the patient, this equipment submits to monitoring of the change of electrocardiogram, respiratory rate, pulse rate, and body temperature. The Surgical Ward is not equipped with this equipment, therefore, it is borrowed from other sections. It is important equipment that should be disposed in the hospital wards of the third medical facilities. Procurement shall be made for 1 unit respectively in the ward for men and the ward for women, i.e. 2 units in total.

G7-16 Oxygen Concentrator

(Priority: A / Requested Quantity: 1) Procurement: 2

While the oxygen supply was made through the central piping system so far, supply through this system has become difficult due to the decrepit facilities. Therefore, the oxygen inhalation has to be made for the patients in the Surgical Ward with this unit individually for each patient. This equipment is very simple and useful for oxygen supply to the patient. Procurement shall be made for 1 unit respectively in the ward for men and the ward for women, i.e. 2 units in total.

8) The Vehicle

G8-1 Ambulance

(Priority: B / Requested Quantity: 5) Procurement: 0

3 ambulances are now disposed, but they are old. The emergency system like one in the developed countries is not adopted here, and the ambulance is mainly used for transfer of a referral patient between hospitals. As a result of the study, it is excluded from the procurement plan of this project, since many beneficiary effects cannot be expected and the necessity of urgent renewal cannot be admitted.

(2) The Yangon Central Women Hospital

The request for the procurement was made from the five (5) sections of this hospital, for the equipment of the Operation Theatre, the Incentive Care Unit, the Neonatal Incentive Care Unit, the Diagnostic Imaging, and the Clinical Pathology and Blood Bank.

1) The Equipment for the Operating Theatres (9 rooms in total)

While this hospital has nine (9) operation theatres, each usage frequency varies widely. Procurement of equipment shall be made for the four (4) sections, centering on the emergency operation theatres (24-hour acceptance system) where there is a great demand and the priority of provision is high.

W1-1 Universal Operating Table for Obstetrics and Gynecology

(Priority: A / Requested Quantity: 4) Procurement: 6

All the operating tables in 9 operation theatres, including the operating table in the emergency operation theatres, are old for use. The function of the height control and the tilting function of the tables have already lost. It is very important to secure a suitable position of the table according to the operational content even for the patient and the medical doctor. The request was made for procurement of 4 units. Renewal shall be made for 6 units (2 units for gynecologic operation theatres, 2 units for obstetric operation theatres, 1 unit for emergency operation theatre, and 1 unit for infectious operation theatre), which are remarkably old.

W1-2 Cardiotocograph

(Priority: A / Requested Quantity: 4) Procurement: 4

It is used to monitor the cardiac rate of fetus and the maternal tocogram at the same time, and detect accurately the condition of fetus (such as the fetal distress). It facilitates the safe and reliable delivery management. It is indispensable equipment in this hospital, which has the obstetric department and annually conducts labor for over 9,000 cases. While this hospital conducts labor with the 2 existing units, one of them is frequently in trouble and the other is barely in the serviceable condition. Disposition of 4 units is necessary at least to conduct labor for 36 cases a day on average. Renewal

shall be made for 2 units (1 unit for delivery room of the general hospital ward, and 1 unit for delivery room of the hospital ward for paybed) and supplementation shall be made for 2 units (1 unit for delivery room of the hospital ward for paybed, and 1 unit for delivery room for infectious cases).

W1-3 Doppler Fetal Heart Detector

(Priority: A / Requested Quantity: 2) Procurement: 3

It is used to auscultate the heart condition and the artery blood flow of fetus by utilizing the ultrasound doppler effect. It is simple equipment that enables to confirm the life of fetus, and which is indispensable for the clinical services in obstetrics and highly beneficial. In this project, procurement shall be made for 1 unit to the hospital ward for paybeds, 1 unit for the general hospital ward and 1 unit for the delivery room of the infectious ward, i.e. 3 units in total.

W1-5 Laparoscope with Light Source

(Priority: A / Requested Quantity: 1) Procurement: 1

1 set of laparoscope (manufactured in 1986) is now disposed, and obstetrical and gynecological services are provided for approximately 820 cases in a year. However, the equipment is too old and of narrow application. It cannot correspond to the recent advance of medical technology. To take a single instance of usage of the laparoscope in this hospital, it is used to make a percutaneous diagnosis of the ectopic pregnancy that implanted in the oviduct and remove the fetus in abnormal implantation by salpingectomy. While the hysterectomy is conducted in the medical facilities of the foreign countries, it is not conducted in this hospital due to the shortage of personnel. As for the patients whom hysterectomy should be necessary, this hospital performs the abdominal operation for them at present.

The abdominal operation costs a great deal for the surgical materials (such as surgical needle and stitch), and requires the patient to stay in hospital for a long time after the operation. In case of laparoscopic operation, it enables to treat the patient within his short hospitalization and lightens the physical and financial burden imposed on the patient. Therefore, it is deemed necessary to procure this equipment. This hospital is applying the

day care system in order to prevent the operational expenses from rising. It is thought that the laparoscopic operation enables to perform operations such as the tubal ligation for day care. Therefore, this hospital gives high priority to the treatment by the laparoscopic operation.

Table 2-4 The Achievement by Laparoscopy
(the year of 2000)

Level 1 (Diagnosis)	Cases
Sterility	150
Ectopic Pregnancy	70
Tumor	170
Abnormal Pelvis	100
Level 2 (Surgical Treatment)	Cases
Visceral Adhesion	150
Cystectomy	30
Hysterectomy	0
Tubal Ligation	120
Salpingectomy	30

It is deemed necessary to immediately renew this equipment in this project.

W1-6 Electric Vacuum Extractor

(Priority: A / Requested Quantity: 4) Procurement: 4

Vacuum extraction is made when the mother or the fetus is in danger in abnormal labor and the forced delivery is necessary. Since it is indispensable equipment for the obstetric section, procurement shall be made for 4 units in total, i.e. 1 unit in the first delivery room, 1 unit in the second delivery room, and 1 unit for each emergency operation theatre (2 rooms).

W1-8 Diathermy

(Priority: A / Requested Quantity: 4) Procurement: 4

It is used for hemostatic incision and coagulation of the tissue of the undergoing patient. In the emergency operation theatres, 1 old unit is shared between 2 rooms. Considering that operations are sometimes conducted for 30 cases or more in a day, it is deemed necessary to renew the old diathermy and to supplement another 1 unit for the emergency operation theatres. The obstetric operation theatre and the gynecologic operation theatre are also in the same circumstances, and it is necessary to procure this equipment for these operation theatres. Accordingly, procurement should be made for 4 units in total.

W1-12 Delivery Bed with Baby Shelf with Casters

(Priority: B / Requested Quantity: 6) Procurement: 6

In the main ward, the first delivery room is equipped with 3 delivery beds, and the second delivery room is equipped with 4 delivery beds. However, the mattress of every bed is torn and the bed frames are rusty. They are almost unfit for use. 6 units are renewed among them.

W1-13 Suction Unit

(Priority: A / Requested Quantity: 4) Procurement: 4

It is used to absorb the blood, pus, irrigation water, and other secretions for the patient in the operation, and it is indispensable in the operation theatre. While 9 units are now disposed for the operation theatres, most of them are old models and frequently in trouble. They are exceeding the durable years. This project aims at improvement of 4 operation theatres, and therefore, 4 units (1 unit for gynecologic operation theatre, 1 unit for obstetric operation theatre, 1 unit for emergency operation theatre, and 1 unit for infectious operation theatre) shall be renewed.

W1-14 Electrocardiograph

(Priority: A / Requested Quantity: 4) Procurement: 4

It is used to diagnose arrhythmia, ischemic heart disease and so on. Considering the handiness, economical efficiency, and noninvasive in use, the significance is high as one of the function test of circulatory organ and physiolo. In order to renew the old equipment, procurement shall be made for 4 units in total (1 unit for delivery room of the general hospital ward, 1 unit for delivery room of the hospital ward for paybed, 1 unit for emergency department, and 1 unit for infection department).

2) The Equipment for the ICU Section

The request was made from this hospital for the Intensive Care Unit (2 rooms, 4 beds in total). Treatment is provided only for 4～5 patients a month on average due to shortage of equipment. Most of the patients are transferred to the Yangon General Hospital. In order to improve such situation, the function of these two (2) rooms shall be recovered in this project.

W2-1 ICU Ventilator

(Priority: A / Requested Quantity: 2) Procurement: 2

This is basic equipment which submits to the respiratory control of the patient who requires mandatory ventilation or who can breathe by himself but requires assisted ventilation. The existing equipment is too old and no longer available, and it is in the situation that the acceptance system of patients cannot be sustained. This project aims at function recovery of this section, and procurement shall be made for 1 unit in each room, i.e. 2 units in total.

W2-2 Pulse Oximeter

(Priority: A / Requested Quantity: 2) Procurement: 0

This equipment consecutively performs nonsurgical monitoring of the respiration of a patient without drawing blood. And, this is indispensable for the operation theatre. It is fundamental equipment to monitor the respiration of patient such as whom in the operation or whom in emergency. Procurement of the bedside monitor with pulse oximeter shall be made in this project, therefore, this equipment is excluded from the procurement plan.

W2-3 Defibrillator

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment is used to give the percutaneous countershock with direct current for the ventricular fibrillation and to restore the original rhythm of the heartbeat. This is indispensable for resuscitation in case of cardiac arrest. It is also indispensable for the ICU where many serious patients are treated. While this hospital is equipped with 2 units of defibrillators, they are old and in bad condition. They are shared with other sections, and it is difficult in using this defibrillator in emergency. Procurement shall be made for 2 units for 2 rooms in this project.

W2-5 Bedside Monitor

(Priority: A / Requested Quantity: 4) Procurement: 5

This is important equipment to grasp the condition of the serious patient and the patient after the operation, which submits to monitoring of a change

of electrocardiogram, respiratory rate, pulse rate, and body temperature. This hospital is equipped with 1 unit of new model and 2 units of old model, however, the units of old model are hardly functioning. Since the acceptance system of patients is not enough effective in this hospital, the serious patients are referred to the Yangon General Hospital. The improvement of ICU rooms is necessary, and procurement shall be made for 5 units, i.e. 1 unit to each bed (4 units to 4 beds) and 1 unit to the emergency room.

W2-6 Syringe Pump

(Priority: A / Requested Quantity: 2) Procurement: 4

It is used to continuously syringe a liquid medicine with strong chemical action in a small quantity into a patient at a constant speed within the set time. This equipment is indispensable for the precise infusion control especially for the serious patient. While the equipment of similar quality but old model is borrowed from other sections, the medical services cannot be extended smoothly in emergency. Since this is basic equipment that should be provided in the ICU, procurement shall be made for 1 unit to each bed, i.e. 4 units in total.

W2-10 Bronchoscope

(Priority: B / Requested Quantity: 1) Procurement: 0

No bronchoscope is now disposed only for the ICU. While it is useful to dispose this equipment in this section, the priority is judged low if it is compared with the informativeness of other requested equipment.

W2-12 Suction Unit

(Priority: A / Requested Quantity: 2) Procurement: 2

It is used to absorb secretion and pus from the postoperative wound, vomit and secretion inside the oral cavity and the throat, and secretion and blood inside the trachea. This section does not possess the suction contrivance of the central piping system, therefore, it is necessary to use the suction unit individually. While 1 unit of old-type is now disposed, it is not functioning properly. Procurement shall be made for 1 unit to each ICU room.

W2-14 ICU Bed

(Priority: B / Requested Quantity: 4) Procurement: 4

This is a special bed designed to enable complicated adjustments necessary for the intensive care, such as shift of the bed and the patient position, and height adjustment of the bed. While 2 ICU beds of old model are disposed, the entire ICU section consists of 4 beds and it is short by 2 beds. Renewal shall be made for 2 beds, which are existing but old, and supplementation shall be made for 2 beds. It contributes to the functional enhancement of ICU.

3) The Equipment for the Neonatal Incentive Care Unit

W3-1 Oxygen Flow meter Set

(Priority: A / Requested Quantity: 10) Procurement: 10

This equipment is used to measure the oxygen flow rate supplied through the medical pipe arrangement of the central piping system or from the oxygen cylinder. This is simple equipment, and seems comparatively easy to be procured by self-effort. Since this is basic equipment, the urgent procurement is deemed necessary and the renewal shall be made for 1 unit to 3 beds, i.e. 10 units to 32 beds in the Neonatal ICU.

W3-2 Bilirubinometer, Percutaneous Type

(Priority: A / Requested Quantity: 3) Procurement: 3

While this section measures the icterus index by taking blood sample, this measurement imposes a heavy burden on the neonates. This equipment performs nonsurgical and percutaneous measurement of the icterus index, and it is especially useful for the diagnosis of the neonatal patients and infirm and immature babies. Procurement shall be made for 1 unit in the pronatis room and 1 unit in each newborn nursery (2 rooms), i.e. 3 units in total.

W3-3 Pulse Oximeter for Neonate

(Priority: B / Requested Quantity: 2) Procurement: 0

This equipment consecutively performs nonsurgical respiratory care of a patient in the operation, and it is indispensable monitor for the ICU. It is fundamental equipment for the respiratory care of serious patient. The procurement shall be made for the bedside monitor with pulse oximeter in this

project, therefore, this equipment is excluded from the procurement plan.

W3-4 Intensive Care Warmer with Resuscitating

(Priority: A / Requested Quantity: 3) Procurement: 3

Because it is an open type, it is difficult to control the oxygen concentration and the humidity in the incubator, and to prevent the infection. Therefore, it is not suitable for the incubation of serious neonatal patients. However, the device management is simple and it is usable for the postnatal treatment and observation, the warming in the depressed body temperature, and the short treatment during incubation. While this section is equipped with 3 units, 1 unit is normally functioning and other 2 units are available but in bad condition. In this project, renewal shall be made for 2 units (1 unit for the pronatis room and 1 unit for newborn nursery) and supplementation shall be made for 1 unit for newborn nursery.

W3-5 Continuous Positive Airway Pressure

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment is used, when the premature baby or the low birthweight infant is in respiratory disturbance and it is judged that the baby is hypoxia or in danger of hypoxia. While it is indispensable for the pronatis incubation, no serviceable unit is disposed in this section. Therefore, the manual artificial respiration is made with ambu bag. However, many cases are reported such as to fail in saving their life, since it is difficult to make the stable air supply for a long time. According to the statistics presented from this hospital, this hospital annually treats more than 1,500 immature babies. This equipment is deemed indispensable for the neonatal intensive care. This hospital annually conducts labor for approximately 9,500 cases, and procurement shall be made for 2 units in this section.

W3-7 Infusion Pump

(Priority: A / Requested Quantity: 2) Procurement: 4

It is used to continuously infuse a liquid medicine with strong chemical action in a small quantity into a patient at a constant speed within the set time. This equipment is indispensable for the precise infusion control

especially for the neonate or the infant patient. This section is now equipped with 2 units of old model, but they are in bad condition. In order to make the infusion control for 32 beds, renewal shall be made for 2 units and supplementation shall be made for 2 units.

W3-8 Syringe Pump

(Priority: A / Requested Quantity: 2) Procurement: 2

This section is now equipped with 1 unit, but it is quantitatively insufficient. It is necessary to dispose 3 units at least, in order to cover 32 beds. Procurement shall be made for 2 units among them in this project.

W3-9 Suction Unit

(Priority: B / Requested Quantity: 2) Procurement: 2

While the Neonatal Incentive Care Unit is judged to currently have the capacity of 30～40 neonates, only 1 unit of old model is disposed here. Because the existing equipment is not in good condition, procurement shall be made for 2 units in total, i.e. 1 unit for renewal and 1 unit for supplementation.

W3-10 Infant Incubator with Phototherapy Unit

(Priority: A / Requested Quantity: 2) Procurement: 8

As for the incubation in the Neonatal Incentive Care Unit, the infant incubator (closed-type) is used to treat the low birthweight infant or other neonatal patient at optimal temperature, hyperoxia and appropriate humidity. While the Neonatal Intensive Care Unit of this hospital is equipped with 8 incubators, most of them are in trouble and only 2 units are available somehow. Since this is very important equipment in this section, renewal shall be made for 8 units.

W3-11 Oxygen Concentrator

(Priority: A / Requested Quantity: 2) Procurement: 10

In the Neonatal Intensive Care Unit, the frequency of oxygen inhalation is high for the immature baby and the neonatal patient. While the oxygen supply in this hospital is made by the central piping system for the present, it is not in good condition and it also becomes necessary to supply oxygen from the

oxygen cylinder. In order to improve such situation, it is necessary to install the equipment that can be used more independently. While the request was made for procurement of 2 units, procurement is planned for 10 units in total, i.e. 8 units for the above-mentioned infant incubators and 2 units for the baby bathinets.

W3-13 Portable X-ray Unit

(Priority: B / Requested Quantity: 1) Procurement: 1

The X-ray unit is now disposed in the radiology department that is 150m away from this section, and the neonate is transferred for radiography. However, it is quite dangerous to transfer the neonate in tracheal intubation to the X-ray room. Therefore, it is necessary to dispose a portable X-ray unit only for this section. Procurement of this equipment is planned for neonates.

4) The Equipment for Diagnostic Imaging

W4-1 Ultrasound Scanner with Printer

(Priority: A / Requested Quantity: 1) Procurement: 5

The ultrasound scanner examines various regions such as circulatory organ, abdomen and body surface. This equipment is economical and easy to operate. It is important equipment which enables to make a diagnosis of the biomedical picture with noninvasive and less burden to the patient. This is indispensable equipment for the specialized hospital in obstetrics and gynecology.

Considering the performance of each department and the number of patients, procurement shall be made as follows.

W4-1 (1) Ultrasound Scanner

Procurement of general-purpose model, which corresponds to obstetrics and gynecology, shall be made for 4 units in total, i.e. 1 unit for the outpatient clinic, 1 unit for the emergency delivery room, 1 unit for the general delivery room, and 1 unit for the delivery room of the hospital ward for paybed.

W4-1 (2) Doppler Ultrasound Scanner

Procurement of a model with doppler function, which enables blood flow measurement of the head and abdomen of children, shall be made for 1 unit to the diagnostic imaging room.

W4-2 Diagnostic X-ray System with Fluoroscopy

(Priority: A / Requested Quantity: 1) Procurement: 1

While 2 units of Japanese make are now disposed, they were procured 21 years ago and they cannot provide the clear image due to aging. This section conducts radiography for 10～15 patients a day, and renewal is deemed necessary for a minimum of 1 unit. It seems appropriate to procure the model with fluoroscopy that enables radiography with barium meal.

5) The Equipment for the Clinical Pathology and Blood Bank

W5-2 Spectrophotometer

(Priority: A / Requested Quantity: 1) Procurement: 2

It is fundamental equipment that is used in the wide fields such as the routine clinical examination (especially, blood test and biochemical examination). While this is basically operated manually, arrangements should be made for this spectrophotometer so that it can be used as a semiautomatic type by appending the incidental function. The request was made for procurement of 1 unit. Procurement shall be made for 2 units in total, i.e. 1 unit to the biochemical examination section and 1 unit to the pathological examination section where aging degradation of the existing equipment assumes serious proportions.

(3) The Yangon Children Hospital

The request for the procurement was made from the five (5) sections of this hospital, for the equipment of the Operation Theatre, the Incentive Care Unit, the Neonatal Unit, the Diagnostic Imaging, and the Laboratory.

1) The Equipment for the Operating Theatres (5 rooms in total)

While this hospital has five (5) operation theatres, only the first operation theatre is functioning normally. Other operation theatres are hardly functioning due to aging and breakdown of the equipment. The first operation theatre is larger than others, and it is equipped with respectively two (2) sets of equipment, such as operating table, ceiling lamp, anaesthesia apparatus and diathermy. The disposition of every equipment is made for two (2) sets, on the assumption that renal transplant is conducted in this operation theatre. The second operation theatre is now used as a storehouse, and the old equipment is kept there. In principle, the operation theatre for infectious disease, which is not used frequently, is excluded from the procurement plan of this project, and provision shall be made for other three (3) operation theatres.

C1-1 Universal Operating Table with Baby Attachment

(Priority: A / Requested Quantity: 2) Procurement: 3

This section has 5 operating tables. However, 3 units among these are too old for use, and the function of height control and tilting table has already been lost. It is very important to respectively secure a suitable position of the table according to the operational content even for the patient and the medical doctor. While the request was made for procurement of 2 units, renewal shall be made for 3 units, which are remarkably old.

C1-2 Ceiling Lamp, Combination Type

(Priority: A / Requested Quantity: 2) Procurement: 3

While 4 ceiling lamps are disposed in this section, these have problems in positioning of the main illuminator and the lighting brightness. In this project, renewal shall be made for 3 units, which are remarkably old.

C1-4 Diathermy

(Priority: A / Requested Quantity: 3) Procurement: 3

This equipment submits to a hemostatic incision and coagulation for a patient in the operation. The 2 operation theatres, where provision of this equipment is planned, are respectively equipped with 1 unit. 1 unit is in trouble due to aging degradation, and another is also in bad condition but used somehow. These 2 units shall be renewed, and 1 unit shall be supplemented in this project.

C1-5 Anaesthesia Apparatus

(Priority: A / Requested Quantity: 2) Procurement: 3

This equipment is used to administer general anaesthesia by using the inhalation anesthetic, so that a patient lapses into unconsciousness and undergoes a painless operation. It is submitted to the operation with the general anaesthesia as well as the intravenous anaesthesia and the local anaesthesia. As for the existing equipment, the mixing chamber of the anesthetic gas is in bad condition due to aging degradation, and the urgent provision is deemed necessary. Renewal shall be made for these existing 2 units, and supplementation shall be made for another 1 unit to the third operation theatre.

C1-6 Cyst scope

(Priority: B / Requested Quantity: 1) Procurement: 0

It is not currently used and the frequency of use is not so high in the pediatrics. Therefore, it is excluded from the procurement plan of this project.

C1-7 Bedside Monitor (ECG/Temp./Spo2/NIBP)

(Priority: A / Requested Quantity: 2) Procurement: 4

This is important equipment to grasp the condition of a patient in and after the operation, which submits to monitoring of a change of electrocardiogram, respiratory rate, pulse rate, and body temperature. The operation theatres, where provision of this equipment is planned in this project, are now equipped with 2 old units. Only electrocardiogram is barely functioning. Procurement shall be made for 4 units in total, i.e. 1 unit to each room aiming at improvement of the 3 rooms and 1 unit to the recovery room.

C1-9 Infusion Pump

(Priority: A / Requested Quantity: 2) Procurement: 3

It is used to continuously infuse a liquid medicine with strong chemical action in a small quantity into a patient at a constant speed within the set time. This equipment is indispensable for the precise infusion control. Only 2 units are disposed for all the operation theatres, and quantitative deficiency causes a trouble. In order to improve the 3 operation theatres in this project, procurement shall be made for 1 unit in each room.

C1-10 Blood Transfusion Warmer

(Priority: C / Requested Quantity: 2) Procurement: 3

In the further study after the signature of the Minutes of Discussions, the meeting was held on the increase in the priority of this equipment between the hospital side and the Study Team. This equipment is used to warm the blood for the children's transfusion. Since the blood transfusion is made to a child for many hours, it may lead the infant patient in the shock state by transfusion of the blood warmed with the hot water in the same way as the transfusion to an adult patient. In this project, procurement shall be made for 3 units on the assumption that they are for common use among 5 operation theatres.

C1-11 Cardiograph Procurement: 3

(At additional request on explanation of the Draft Report)

It is used to diagnose an arrhythmia or an ischemic heart disease, and it is important equipment in the function test for circulatory organ and physiology. This hospital is short of this equipment in quantity, therefore, it is not disposed in this section. Since this is indispensable as surgical equipment, procurement shall be made for 1 unit each to the operation anteroom, the operation theatre and the recovery room.

C1-12 Suction Unit Procurement: 8

(At additional request on explanation of the Draft Report)

The existing equipment is too old and not available. Procurement shall be made for 8 units in total, i.e. 1 unit to each operation theatre (3 rooms), 2 units to the recovery room, and 3 units to the surgical ward.

2) The Equipment for the ICU Section

It was confirmed in the Basic Design Study that this hospital was running four (4) beds (in 2 rooms) for the intensive care and six (6) beds for the intensive care monitoring. Provision was made for the ICU section with all the necessary equipment, centering on the bedside monitors (the central control system) and ventilators, by the Japan's Grant Aid in 1986. Most of all the equipment is in trouble due to aging, and is kept in the warehouse.

C2-1 ICU Ventilator for Pediatric

(Priority: B / Requested Quantity: 2) Procurement: 2

This is basic equipment, which submits to the respiratory control of the patient who requires mandatory ventilation, or who can breathe by himself but requires assisted ventilation. As requested, procurement shall be made for 1 unit each to the pediatric ICU room and the ICU room for children with circulatory disease.

C2-2 ICU Ventilator for Infant

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment is used, when the immature baby (such as premature baby and the low birthweight infant) is in respiratory disturbance and hypoxia. No ventilator for infant is disposed in this section, and the manual artificial respiration is made with ambu bag. This hospital annually accepts 1,800 immature babies, and 400 patients equivalent to 20% of them die. It is reported that more than half of the death is caused by respiratory failure. Procurement shall be made for 2 units with the aim of raising the lifesaving ratio for the immature babies.

C2-3 Bedside Monitor (ECG/Temp./Spo2/NIBP)

(Priority: A / Requested Quantity: 2) Procurement: 2

This section is now equipped with 5 available units, for all that they are in bad condition. This is important equipment to grasp the condition of a serious patient and a patient after the operation, which submits to monitoring of the change of electrocardiogram, respiratory rate, pulse rate, and body

temperature. However, they are not functioning properly due to aging degradation, and immediate provision is necessary. In this project, procurement shall be made for 2 units in the 2 ICU rooms.

C2-5 Capnometer

(Priority: B / Requested Quantity: 1) Procurement: 0

This section possesses the blood gas analyzer purchased in 1996. While it is now out of action due to shortage of consumables, the capnometer shall not be procured in this project because the blood gases can be monitored by the blood gas analyzer.

C2-6 ICU Bed

(Priority: B / Requested Quantity: 4) Procurement: 0

The beds that are now disposed are deemed still usable, and this equipment is excluded from the procurement plan of this project.

C2-7 Infant Incubator

(Priority: A / Requested Quantity: 2) Procurement: 4

The infant incubator (closed-type) is used to treat the low birthweight infant or other neonatal patient at optimal temperature, hyperoxia and appropriate humidity. It is indispensable equipment in the ICU section of the children hospital. While this section is now equipped with 2 units, they are old and not functioning. They are used only as neonatal bed. Renewal shall be made for 2 units and supplementation shall be made for 2 units.

C2-8 Air Compressor, Oiless and Silent Type

(Priority: B / Requested Quantity: 2) Procurement: 0

Considering the balance between the old facilities and the air compressor that covers the whole area of the ICU, it is believed that there are problems in the installation and the future management of this equipment. Therefore, this is decided to exclude from the procurement plan.

C2-9 Oxygen Concentrator

(Priority: A / Requested Quantity: 2) Procurement: 2

While the medium-sized oxygen equipment is now disposed, the oxygen supply is small and it is not able to cope with every patient who requires oxygen supply. However, the equipment work is required for the installation of the requested equipment. Therefore, this section shall be provided with the simple type of oxygen concentrator, which does not require any installation work. Procurement shall be made for 1 unit to every 2 beds, i.e. 2 units in total.

3) The Equipment for the Neonatal Unit

C3-1 Infant Incubator

(Priority: A / Requested Quantity: 5) Procurement: 7

The infant incubator (closed-type) is used to treat the neonatal patient at optimal temperature, hyperoxia and appropriate humidity. It is indispensable equipment in the Neonatal Unit of the children hospital. This section in now equipped with 5 incubators. 1 unit among these is in bad condition but used by repeating repairs, and other 4 units are out of order due to malfunctioning of the temperature control. Accordingly, the immediate renewal is necessary for these 5 units (3 units for immature babies in general condition, and 2 units for immature babies in crisis). The supplementation shall be made for 2 units (for immature babies in general condition). The functional enhancement of the Neonatal Unit is planned by procurement of these 7 units

C3-2 Apnea Alarm

(Priority: A / Requested Quantity: 5) Procurement: 5

It is set to the neonatal patient under treatment in the incubator, and it notifies the patient's condition by alarm when he fells into apnea. While this section is now equipped with 1 unit of apnea alarm that was manufactured 15 years ago, this equipment is in bad condition and can be hardly used. This section treats 10～15 neonates a day, and therefore, procurement shall be made for 1 unit to 3 neonates, i.e. Total 5 units.

C3-3 Bedside Monitor (ECG/Temp./Spo2/NIBP)

(Priority: A / Requested Quantity: 4) Procurement: 4

This is important equipment to grasp the condition of the immature baby (such as premature baby and low birthweight infant), the neonatal patient and the patient after the operation, and which submits to monitoring of the change of electrocardiogram, respiratory rate, pulse rate, and body temperature. This equipment is not disposed in this section, and it is borrowed from other sections if necessary. The cases whom the treatment is necessary with this equipment are estimated to be 3～4 patients a day, considering the number of neonates. Procurement shall be made for 4 units.

C3-5 Capnometer

(Priority: B / Requested Quantity: 1) Procurement: 0

This is a monofunctional equipment to measure the carbon dioxide concentration. The bedside monitor with function of measurement of the carbon dioxide concentration shall be procured in this project, and therefore, this equipment is excluded from the procurement plan.

C3-6 ICU Ventilator for Infant

(Priority: A / Requested Quantity: 2) Procurement: 2

This equipment is used to treat the premature baby or the low birthweight infant in respiratory disturbance or hypoxia. Such patients are now treated with the oxygen cylinder set with flow meter and humidifier, inhalation by oxygen concentrator, and manual artificial respiration with ambu bag. Approximately 400 neonates are monthly accepted, and this equipment is used continuously for 1～2 weeks. Considering such situation, procurement shall be made for 2 units on the assumption that the average number of cases treated with this equipment is 2 patients.

C3-7 Syringe Pump Procurement: 4

(At additional request on explanation of the Draft Report)

This equipment is indispensable for the precise infusion control for the serious patient or the infant patient. This hospital is short of this equipment in quantity. The medication has depended on eye-estimation and technique of

the doctor. In order to improve such situation, procurement shall be made for 4 units in total, i.e. 2 units respectively to the Neonatal Unit and to the pronatis room.

C3-8 Bilirubinometer Procurement: 2

(At additional request on explanation of the Draft Report)

This equipment performs nonsurgical and percutaneous measurement of the icterus index, and it is especially useful for the diagnosis of the neonatal patients and infirm and immature babies. The existing equipment is too old and it disturbs to obtain the accurate index. Procurement shall be made for 1 unit respectively to the pronatis room and the Neonatal Unit.

4) The Equipment for Diagnostic Imaging

C4-3 Mobile X-ray Unit

(Priority: B / Requested Quantity: 1) Procurement: 1

It is used for an inpatient that is difficult to move to the X-ray room. This equipment is carried to his sickroom and the radiography can be taken without transfer of the patient, therefore, it is quite useful. The existing equipment is too old for use and out of order. Renewal shall be made in this project.

C4-4 Automatic X-ray Film Processor

(Priority: B / Requested Quantity: 1) Procurement: 0

X-ray films are now developed manually. The roentgen diagnosis is made for 615 cases on the monthly average according to the performance record of 2000, and it is equivalent to 25 cases on the daily average. If the X-ray units are procured in this project and it causes 20% increase of cases of the roentgen diagnosis, it is equivalent to 30 cases a day. Considering the above situation and the maintenance cost for this equipment, the manual development should be continued.

5) The Equipment for the Laboratory

C5-1 Haematology Analyzer

(Priority: B / Requested Quantity: 1) Procurement: 0

The inspections in the blood examination room are mainly made of erythrocyte sedimentation rate, hemoglobin, red blood cell count, leukocyte count, platelet, etc. The blood test is made annually for approximately 15,000 cases. This is equivalent to less than 50 cases on daily average, and any benefit cannot be expected from providing an automatic blood analyzer. The hemanalysis is covered enough by manual operation, and the procurement of this equipment is not planned.

C5-3 Spectrophotometer

(Priority: A / Requested Quantity: 2) Procurement: 1

It is fundamental equipment that is used in the wide fields such as the routine clinical examination (especially, blood test and biochemical examination). While the equipment of old model is now disposed, the test value is not stable and the renewal should be necessary. Procurement shall be made for 1 unit in this project. Moreover, arrangements should be made for this spectrophotometer so that it can be used as a semiautomatic type by appending the incidental function.

C5-4 Electrolyte Analyzer

(Priority: B / Requested Quantity: 1) Procurement: 0

This laboratory is not equipped with the electrolyte analyzer. The electrolyte analysis is now relied on the National Health Laboratory as a n occasion demands. It is deemed practical to ask for further cooperation to the National Health Laboratory. Therefore, this equipment shall not be procured in this project.

C5-6 Binocular Microscope

(Priority: A / Requested Quantity: 4) Procurement: 3

It is very fundamental equipment in the laboratory and also indispensable for the routine inspection such as urinalysis, blood test, and bacteriological examination. While the blood examination room is now equipped with 2 microscopes,

they are in such bad conditions that the stage is not fixed. The renewal shall be made for these 2 units, and procurement shall be made for the 1 unit in the bacteriological examination room that is difficult of normal use.

C5-9 Binocular Microscope

(Priority: B / Requested Quantity: 1) Procurement: 0

This request is excluded from the procurement plan of this project, since the binocular microscope shall be procured, according to the above C5-6.

2. Study of the power situation

The power supply does not meet the demand in Myanmar. The intentional power failure is nothing out of the ordinary in the cities. In Yangon, the power failure occurs about two (2) hours in the morning and evening for the recent year. However, the medical facilities take supply through special wiring directly from the power plant, and the power failure does not disturb the daily medical services of the facilities.

Electricity rate is cheap. Moreover, the rate in the public facilities is less than 1/50 of which in the general household, and is about 10 yen/1,000 MWh.

The table 2-5 indicates the power fluctuation data of the facilities which were surveyed for this project. Because the measurement of the power fluctuation was made around noon when the power consumption is relatively high, the fluctuation data given here are generally low. The power fluctuation ratio is within about 15%. As for the equipment to be procured in this project, majority of such equipment are hardly influenced by this much voltage drop. The procurement of the UPS and the voltage regulator is planned for the electronic equipment. For those reasons, there is no problem for the procurement of the electronic equipment.

Table 2-5 Fluctuation of the Electricity

Hospital	New Yangon General Hospital	Yangon Central Women Hospital	Yangon Children Hospital
Date of Measurement	01-11-12	01-11-15	01-11-20
Fluctuation Ratio	±1.2%	±2.1%	±2.3%
Average	221.2	224.4	224.7
Maximum	222.3	225.9	228.5
Minimum	220.4	221.1	221.6

3. Study of the local agent of equipment manufacturer

There are many local agents which handle Japanese products in Myanmar. On the other hand, many Western products recently come onto the market. The products of manufacture, which does not have a local agent in Myanmar, also come onto the market. As for repair of such equipment, there are many problems about the maintenance service system. In order to ensure the maintenance and control after procurement of equipment, the equipment to be procured is in principle limited to the one of which the manufacture has a local agent in Myanmar. The possibility of procuring some equipment from a third country shall be considered in view of the predominance of the price and the competing principle in tender. The local

agents handling the medical equipment in Myanmar and the neighboring countries were mentioned in the following.

Table 2-6 The List of Local Agent In Myanmar and neighboring countries

Name of Agent	Handling Medical Equipment
NISSEI YANGON SERVICE CENTRE	Anaesthetic Appartus, Patiant Monitor, ECG etc X-Ray、Ultrasound Machine etc.
GOLD LITE PTE LTD	X-Ray、Ultrasound Machine etc.
NI LAY NAING CO., LTD.	Patiant Monitor, Incubator etc.
MEDITECH CO., LTD.	X-Ray, Patiant Monitor, ECG Ultrasound Machine etc.
SILVER LOTUS CO., LTD.	Operation Bed, Delivery Bed
U MYA ZAW	X-Ray Film
LION MYANMAR INTERNATIONAL CO., LTD.	Medical Sergical Consumable, Sergical Instrument etc.
EURO CONTINENT, MYANMAR	Hemo-Dializer etc.
CONCORDIA INTERNATIONAL	Anaesthetic Appartus, Patiant Monitor, ECG Fiberscope etc.
AUSTRALASIA MARKETING, TRADE & TECHNOLOGY CO., LTD.	Anaesthetic Appartus, Patiant Monitor, ECG X-Ray、Ultrasoud etc.
THREE SEASONS GENERAL TRADING CO., LTD.	Ventilation Equipment
DIETHELM & CO., LTD.	Infusion Pump, Disposable Medical Consumables
NIKKO GENERAL TRADING	X-Ray Film
BLUE CROSS LABORATORIES	Ventilation Equipment
RANBAXY LABORATORIES LTD.	Blood Gas Analyzer, Spectrophotometer etc.
WIN TRADING	Dental Equipment

2-2-2-2 Equipment Plan

1) Selection of equipment

The equipment that is finally to be procured in this project was selected according to the following principles; "Basic criteria for selection of equipment". The result of assessment is shown in Table 2-7 "Examination of the Requested Equipment".

【 Basic criteria for selection of equipment 】

< Criteria for giving high priority >

(1) Equipment that is to be a replacement of the existing but old equipment.

(2) Equipment that is obviously in shortage.

(3) Equipment that is indispensable for basic medical services as a top referral hospital.

(4) Equipment that is easy to operate and maintain.

(5) Equipment that may give much benefit and effect to the designated facility.

(6) Equipment that is highly cost-effective.

(7) Equipment that is proved for its medical usefulness and necessity.

< Criteria for giving low priority >

(1) Equipment that requires high operation and maintenance cost.

(2) Equipment that has limited benefit and effect to the designated facility.

(3) Equipment that is low cost-effective.

(4) Equipment that is not used for diagnosis and treatment, but for academic research purpose.

(5) Equipment that can be substituted with a simple one.

(6) Equipment that may cause environmental pollution by its medical waste, etc.

(7) Equipment that is not proved for its medical usefulness and necessity.

(8) Equipment that is not for medical use but for private usage by the facility staff.

(9) Equipment that the designated facility has more than minimum required quantity (inefficient or redundant equipment).

Additional criteria for giving high priority after consideration of the local conditions:

(1) Equipment that can be operated by the current technical capability of the designated facility.

(2) Equipment that is or is to be maintained by the facility staff or an outside trustee who is entrusted by the designated facility.

(3) Equipment that matches with the social position and function of the designated facility (referral system and local needs).

(4) Equipment that usefulness can be expected also in cooperation with other donors.

Additional criteria for giving low priority after consideration of the local conditions:

(1) Equipment that the spare parts and consumables are difficult to be locally procured.

(2) Equipment that cannot be operated by the current technical capability of the designated facility.

(3) Equipment that is not or shall not be maintained by the facility staff or an outside trustee who is entrusted by the designated facility.

(4) Equipment that does not match with the social position and function of the designated facility (referral system and local needs).

(5) Equipment that requires large scope of infrastructure work (water, power supply and drainage, etc.) for its installation.

(6) Equipment that can be substituted by efficient usage of the existing equipment.

After selection of the equipment to be procured through the above-stated process, a comprehensive assessment is given to each of the equipment.

Comprehensive assessment:

○ ·····Equipment of which the procurement is admitted to be appropriate.

× ·····Equipment that is not included in the project.

Table 2-7 Examination of the Requested Equipment

New Yangon General Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria									Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity								Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
G1: Operation Theatre																															
G1-1	Operating Table	A	5	○		○	○	○	○											○	○									○		○	4
G1-2	Pulse Oximeter	A	4																○													×	–
G1-3	Capnometer	C	4												○														○			×	–
G1-4	Diathermy (Bipolar)	A	4	○		○	○	○	○											○	○									○		○	4
G1-5	Anaesthetic Ventilator	A	4																○													×	–
G1-6	Datascope	C	4												○														○			×	–
G1-7	Hot Air Sterilizer	A	1																○										○			×	–
G1-8	Ceiling Lamp, Combination Type	A	5	○		○	○	○	○											○	○									○		○	4
G1-9	Anaesthetic Apparatus w/ventilator	A	5	○		○	○	○	○											○	○	○								○	○	○	5
G1-10	Bedside Monitor	A	5	○	○	○	○	○	○											○	○	○								○	○	○	5
G1-11	Suction Unit	A	10	○		○	○	○	○											○	○									○	○	○	5
G1-12	Infusion Pump	A	3		○	○		○	○											○	○	○	○								○	○	5
G1-13	Syringe Pump	A	1		○	○		○	○											○	○	○	○								○	○	2
G1-14	Defibrillator	A	2	○	○	○	○													○	○									○	○	○	2
G1-15	Cardiograph	A	2		○	○	○	○	○											○	○	○								○		○	2
G1-16	Table Top Sterilizer	A	5		○	○	○	○	○											○	○									○		○	3
G1-17	Instrument Sterilizer	A	6	○		○	○	○	○											○	○									○		○	6
G1-18	Automatic Ultrasound Washer	C	1												○																	×	–
G1-19	Ultraviolet Hand Washer	C	8												○																	×	–
G1-20	Sphygmomanometer	C	5																○										○			×	–
G1-21	Pharmaceutical Refrigerator	A	1	○			○	○	○											○	○									○		○	1
G2: Intensive Care Unit																															
G2-1	ICU Ventilator	A	4	○		○	○	○												○	○	○								○	○	○	4
G2-2	Suction Unit	A	4	○	○		○	○	○											○	○									○		○	4
G2-3	Cardiograph	A	2		○	○	○	○	○											○	○	○									○	○	2
G2-4	Ultraviolet Hand Washer	C	1												○																	×	–
G2-5	Sphygnomanometer	C	2																○										○			×	–
G2-6	Pharmaceutical Refrigerator	A	1	○			○	○	○											○	○									○		○	1
G2-7	Spirometer	C	2												○														○			×	–
G2-8	Arterial Blood Gas Analyzer	A	1	○		○		○		○										○	○	○								○		○	1
G2-9	Pulse Oximeter	A	4																○													×	–
G2-10	Patient Monitor	C	4																○													×	–
G2-11	Capnometer	C	2												○				○										○			×	–
G2-12	Datascope	C	4																○													×	–
G2-13	Defibrillator with Synchronizaion	A	2	○		○	○													○	○									○		○	2
G2-14	Bedside Monitor	A	4	○	○	○	○	○	○											○	○	○								○	○	○	6
G2-15	Oxygen Concentrator	A	2		○	○	○	○	○											○	○										○	○	2

Table 2-7 Examination of the Requested Equipment

New Yangon General Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria									Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity								Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
G3: Urology Unit																															
G3-1	Electrosurgical Unit	B	2			○		○		○										○		○								○		○	1
G3-2	Video System (for above)	B	1																○													×	–
G3-3	Percutaneous Nephroscope	A	1		○	○		○		○										○		○								○		○	1
G3-4	Pharmaceutical Refrigerator	B	1	○			○		○											○	○									○		○	1
G3-5	Table Top Sterilizer	A	2	○	○		○		○											○	○									○		○	2
G3-6	Suction Unit	A	2		○		○	○	○											○	○										○	○	2
G3-7	Defibrillator	B	1																○													×	–
G3-8	Ultraviolet Hand Washer	C	1												○																	×	–
G3-9	Sphygmomanometer	C	1																○										○			×	–
G3-10	Instrument Sterilizer	A	2	○	○		○		○											○	○									○		○	2
G4: Diagnostic Imaging																															
G4-1	Whole Body Computed Tomographic	A	1	○		○		○		○										○	○	○								○		○	1
G4-2	Doppler Ultrasound Scanner	B	1			○	○	○		○										○	○	○									○	○	1
G4-3	Digital Subtraction Angiography	B	1	○		○		○		○										○	○	○								○		○	1
G4-4	Portable X-ray Machine	A	2	○		○	○	○												○	○									○		○	1
G4-5	Ultrasound Maichine with Printer	A	1	○		○	○	○		○										○	○	○								○		○	1
G4-6	Mammography Unit	C	2									○	○														○					×	–
G4-7	Diagnostic X-ray System with TV	A	2	○		○	○	○	○											○	○	○								○		○	1
G4-8	X-ray Film Processor	A	2	○																○	○									○		○	1
G4-9	Laser Printer for X-ray System	C	1												○																	×	–
G4-10	C-arm X-ray Unit	B	1	○	○	○		○		○										○	○	○								○		○	1
G4-11	Digital Film for Imaging System	C	5												○														○			×	–
G4-12	Ganmar Camera Set System	B	1	○		○		○		○										○	○	○								○		○	1
G5: Clinical Laboratory																															
G5-1	Biochemistry Analyzer	B	1								○				○									○		○			○			×	–
G5-2	Blood Cell Counter	B	1								○				○									○		○						×	–
G5-3	Dry Chemistry Analyzer	C	1								○				○									○		○			○			×	–
G5-4	Eliza Reader	C	1								○													○								×	–
G5-5	Coagulation Analyzer	B	1								○				○									○								×	–
G5-6	Auto Still Apparatus	A	2	○				○	○											○	○										○	○	2
G5-7	Adjustable Pipettes & Pipette Tips	B	1												○														○			×	–
G5-8	Automatic Chemistry Analyzer	B	1								○				○									○		○						×	–
G5-9	Electrolyte Analyzer	C	1								○													○		○						×	–
G5-10	Blood Cell Counter	B	1	○		○		○	○	○										○	○									○		○	1
G5-11	Spectrophotmeter	A	1	○	○	○	○	○	○											○	○	○								○		○	1
G5-12	Microscope	A	2	○			○	○	○											○	○									○		○	2
G5-13	Automatic Tissue Processor	A	1	○		○			○											○	○									○		○	1
G5-14	Microtome	A	1																○										○			×	–

Table 2-7 Examination of the Requested Equipment

New Yangon General Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria									Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity									Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6			Evalu-ation	Quantity
G5-15	Tissue TEK	A	1	○		○			○											○	○									○		○	1
G5-16	Pharmaceutical Refrigerator	B	1	○			○	○	○											○	○									○		○	1
G5-17	Centrifuge	A	2	○			○													○	○									○		○	1
G5-18	Coagulometer	A	1	○				○												○	○									○		○	1
G5-19	Plasma Sterilizer	C	1								○				○									○								×	–
G6: Medical Ward																																	
G6-1	Defibrillator	A	2	○	○		○													○	○									○		○	2
G6-2	Cardiac Monitor	B	3	○	○		○	○	○											○	○										○	○	3
G6-3	Bedside Monitor	C	2																○													×	–
G6-4	Oxygen Concentrator	A	2	○	○		○	○	○											○	○									○	○	○	6
G6-5	Infusion Pump	A	2		○		○	○	○											○										○	○	○	4
G6-6	Syringe Pump	A	1		○		○	○	○											○											○	○	6
G6-7	Pulse Oximeter	A	2		○		○	○	○											○											○	○	2
G6-8	Spirometer	A	1												○																	×	–
G6-9	Suction Unit	A	2	○			○		○											○	○									○		○	2
G6-10	Cardiograph	A	3	○			○	○	○											○	○									○		○	1
G6-11	Table Top Sterilizer	B	2	○			○		○											○	○									○	○	○	2
G6-12	Ultraviolet Hand Washer	C	1												○																	×	–
G6-13	Pharmaceutical Refrigerator	B	1																										○			×	–
G6-14	Sphygmonanometer	C	2																○										○			×	–
G7: Surgical Ward																																	
G7-1	Gastrointestinal Fiberscope Unit	A	2	○	○	○		○												○	○	○								○		○	2
G7-2	Monitoring System	A	1			○		○		○										○	○	○									○	○	1
G7-3	Duodenoscope Unit	C	2	○	○	○		○												○	○	○								○		○	1
G7-4	Bronchofiberscope Unit	A	2	○		○		○												○	○	○								○		○	1
G7-5	Light Source for Fiberscope	A	3	○		○	○	○												○	○	○								○		○	3
G7-6	Sphygmomanometer	C	1																○										○			×	–
G7-7	Pharmaceutical Refrigerator	B	1	○			○	○	○											○	○									○		○	1
G7-8	Instrument Sterilizer	A	2	○	○		○	○	○											○	○									○		○	2
G7-9	Table Top Sterilizer	A	2	○			○	○	○											○	○									○		○	1
G7-10	Ultraviolet Hand Washer	C	1												○																	×	–
G7-11	Cardiograph	B	1																○													×	–
G7-12	Suction Unit	A	2	○	○		○		○											○	○										○	○	2
G7-13	Syringe Pump	A	1		○			○	○											○	○										○	○	2
G7-14	Infusion Pump	A	2		○			○	○											○	○										○	○	2
G7-15	Bedside Monitor	A	2		○	○	○	○	○											○	○										○	○	2
G7-16	Oxygen Concentrator	A	1		○		○	○	○											○	○										○	○	2
G8: Vehicle																																	
G8-1	Ambulance with Emergency	B	5									○	○																○			×	–

Table 2-7 Examination of the Requested Equipment

Yangon Central Women Hospitral

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria										Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity									Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
W1: Operation Theatre																																
W1-1	Universal Operating Table for Obs./Gyne.	A	4	○	○	○	○	○	○											○	○									○		○	6
W1-2	Cardiotonogram	A	4		○	○		○	○											○	○	○								○	○	○	4
W1-3	Doppler Fetal Heart Detector	A	2		○	○	○	○	○											○	○	○									○	○	3
W1-4	Stereo Colposcope	C	2																○										○			×	–
W1-5	Laparoscope with Light Source	A	1			○		○		○												○								○		○	1
W1-6	Electric Vacuum Extractor	A	4	○	○	○	○	○	○											○	○									○	○	○	4
W1-7	Suction Curettage with Curettes	C	1																○										○			×	–
W1-8	Diathermy	A	4	○	○	○	○	○	○											○	○									○	○	○	4
W1-9	Operating Microscope	C	1																○										○			×	–
W1-10	Hysteroscope set with Light Source	A	1			○		○		○												○								○		○	1
W1-11	Fowler's Bed	C	6																○										○			×	–
W1-12	Delivery Bed	B	6	○			○	○	○											○	○									○		○	6
W1-13	Suction Unit	A	4	○			○	○	○											○	○									○		○	4
W1-14	Electrocardiograph	A	4		○	○	○	○	○											○	○	○								○	○	○	4
W2: Intensive Care Unit																																
W2-1	ICU Ventilator	A	2		○	○	○	○												○	○	○								○		○	2
W2-2	Pulse Oximeter	A	2																○													×	–
W2-3	Defibrillator	A	2		○	○														○											○	○	2
W2-4	Oxygen Monitor	C	2												○																	×	–
W2-5	Bedside Monitor	A	4		○	○	○	○	○											○	○									○	○	○	5
W2-6	Syringe Pump	A	2		○	○		○	○											○	○										○	○	4
W2-7	Infusion Pump	A	2		○	○		○	○											○	○										○	○	2
W2-8	Capnometer	C	2																											○			×	–
W2-9	Na/K/Cl Analyzer	C	1								○								○											○			×	–
W2-10	Bronchoscope	B	1									○	○																				×	–
W2-11	Osmometer	C	1								○	○	○																				×	–
W2-12	Suction Unit	A	2	○			○	○	○											○	○									○	○	○	2
W2-13	Disposable CVP Measurintg Set and Cannula	C	50								○	○	○																				×	–
W2-14	ICU Bed	B	4		○		○	○	○											○										○	○	○	4
W3: Neonatal Intensive Care Unit																																
W3-1	Oxygen Flowmeter Set	A	10	○	○		○		○											○		○								○		○	10
W3-2	Bilirubinometer, Percutaneous Type	A	3		○	○	○	○	○											○											○	○	3
W3-3	Pulse Oximeter for Neonate	B	2																○										○			×	–
W3-4	Intensive Care Warmer	A	3	○		○	○	○	○											○	○	○								○	○	○	3
W3-5	Continuous Positive Airway Pressure	A	2		○	○	○	○												○	○	○									○	○	2
W3-6	Disposable Endotracheal Tubes	C	200																											○			×	–
W3-7	Infusion Pump	A	2		○	○		○	○											○	○									○	○	○	4
W3-8	Syringe Pump	A	2		○	○		○	○											○	○										○	○	2

Table 2-7 Examination of the Requested Equipment

Yangon Central Women Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria										Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity									Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
W3-9	Suction Unit	B	2	○	○		○	○	○											○										○	○	○	2
W3-10	Infant Incubator	A	2	○		○	○	○	○											○	○	○								○		○	8
W3-11	Oxygen Concentrator	A	2		○	○	○	○	○											○	○									○	○	○	10
W3-12	Electrocardiograph	A	1		○	○	○	○	○											○	○	○									○	○	1
W3-13	Portable X-ray Unit	B	1		○	○	○													○	○										○	○	1
W4: Diagnostic Imaging																																	
W4-1	Ultrasound Scanner	A	1	○	○	○	○	○	○											○	○	○								○	○	○	5
W4-2	Diagnostic X-ray System w/Fluoroscopy	A	1	○	○	○	○	○	○											○	○	○								○		○	1
W4-3	Automatic X-ray Film Processor	C	1								○				○				○										○			×	–
W4-4	Ultrasound Scanner, Portable	A	1	○	○	○	○	○	○											○	○	○								○		○	1
W5: Clinical Pathology and Blood Bank																																	
W5-1	Urea & Electrolyte Analyzer	C	1								○				○									○		○						×	–
W5-2	Spectrophotmeter	A	1	○	○	○	○	○	○											○	○	○								○		○	2
W5-3	Auto Still Apparatus	A	1	○		○		○	○											○	○									○		○	1
W5-4	Automatic Tissue Processor	A	1	○		○			○											○	○									○		○	1
W5-5	Rotary Microtome w/Knives	C	1																○										○			×	–
W5-6	Paraffin Section Mounting Water Bath	A	1	○		○	○	○	○											○	○									○		○	1

Table 2-7 Examination of the Requested Equipment

Yangon Children Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria															Additional Criteria										Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity									Criteria for giv-ing High Priolity				Criteria for giving Low Priolity								Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
C1: Operation Theatre																																
C1-1	Universal Operating Table w/Baby Attachment	A	2	○	○	○	○	○	○											○	○									○		○	3
C1-2	Ceiling Lamp, Combination Type	A	2	○	○	○	○	○	○											○	○									○		○	3
C1-3	Autoclave	A	1	○	○	○	○	○	○											○	○									○		○	1
C1-4	Diathermy	A	3	○	○	○	○	○	○											○	○									○	○	○	3
C1-5	Anaesthesia Apparatus w/ventilator	A	2	○	○	○	○	○	○											○	○									○	○	○	3
C1-6	Cystoscope	B	1										○																			×	–
C1-7	Bedside Monitor	A	2	○	○	○	○	○	○											○	○									○	○	○	4
C1-8	Bedside Monitor (ECG/Temp./Spo2/IBP)	C	2																○													×	–
C1-9	Infusion Pump	A	2		○	○		○	○											○	○										○	○	3
C1-10	Blood Transfusion Warmer	C	2			○		○												○											○	○	3
C1-11	Cardiograph	(Requested at DF)			○	○	○	○	○											○	○	○									○	○	3
C1-12	Suction Unit	(Requested at DF)		○		○	○	○	○											○	○									○	○	○	8
C2: Intensive Care Unit																																
C2-1	ICU Ventilator for Paediatric	B	2		○	○	○	○												○	○	○									○	○	2
C2-2	ICU Ventilator for Infant	A	2		○	○	○	○												○	○	○									○	○	2
C2-3	Bedside Monitor	A	2	○	○	○	○	○	○											○	○									○		○	2
C2-4	Bedside Monitor (ECG/Temp./Spo2/IBP)	C	2																○													×	–
C2-5	Capnometer	B	1													○													○			×	–
C2-6	ICU Bed	B	4													○			○										○			×	–
C2-7	Infant Incubator	A	2	○	○	○	○	○	○											○	○	○								○	○	○	4
C2-8	Air Compressor, Oiless & Silent Type	B	2													○												○				×	–
C2-9	Oxygen Concentrator	A	2		○	○	○	○	○											○	○									○		○	2
C3: Neonatal Unit																																
C3-1	Infant Incubator	A	5	○	○	○	○	○	○											○	○	○								○	○	○	7
C3-2	Apnea Alarm	A	5		○	○	○	○	○											○	○	○								○	○	○	5
C3-3	Bedside Monitor	A	4	○	○	○	○	○	○											○	○										○	○	4
C3-4	Bedside Monitor (ECG/Temp./Spo2/IBP)	C	4																○													×	–
C3-5	Capnometer	B	1													○													○			×	–
C3-6	ICU Ventilator for Infant	A	2		○	○	○	○												○	○	○									○	○	2
C3-7	Syringe Pump	(Requested at DF)			○	○		○	○											○	○	○	○								○	○	4
C3-8	Bilirubinometer	(Requested at DF)			○	○	○	○	○											○										○		○	2
C4: Diagnostic Imaging																																
C4-1	Diagnostic X-ray System w/TV & Simple X-ray	A	1	○	○	○	○	○	○	○										○	○	○								○		○	1
C4-2	Ultrasound System with Doppler	A	1		○	○	○	○	○	○										○	○	○									○	○	1
C4-3	Mobile X-ray Unit	B	1	○		○	○	○												○	○									○		○	1
C4-4	Automatic X-ray Film Processor	B	1									○	○		○														○			×	–
C5: Clinical Laboratory																																
C5-1	Haematology Analyzer	B	1								○				○									○		○						×	–
C5-2	Blood Chemistry Analyzer	C	1								○				○									○		○			○			×	–
C5-3	Spectrophotometer	A	2	○	○	○	○	○	○	○										○	○	○								○		○	1
C5-4	Electrolyte Analyzer	B	1								○													○		○						×	–
C5-5	Electrophoresis Apparatus	A	1		○	○	○	○	○											○	○									○		○	1

Table 2-7 Examination of the Requested Equipment

Yangon Children Hospital

Item No.	Name of Equipment	Priority	Reuested Qty	Basic Criteria																Additional Criteria										Re-newal	Supple-ment	Result	
				Criteria for giving High Priolity							Criteria for giving Low Priolity									Criteria for giv-ing High Priolity				Criteria for giving Low Priolity									Evalu-ation	Quantity
				1	2	3	4	5	6	7	1	2	3	4	5	6	7	8	9	1	2	3	4	1	2	3	4	5	6				
C5-6	Binocular Microscope	A	4	○	○	○	○	○	○	○										○	○		○							○		○	3
C5-7	Blood Storage Refrigerator	A	1	○			○													○	○									○		○	1
C5-8	Refrigerated Centrifuge	A	1	○		○	○			○										○	○	○	○							○		○	1
C5-9	Binocular Microscope	B	1																○													×	–

As the result of above examination, the equipment to be procured for each hospital and department are as follow.

Table 2-8 Item Number of requested equipment and procured equipment under the project

Project site	Requested equipment Item/number	Procured equipment under the project item/number
New Yangon General Hospital		
Operation Theatre	21 items/85 pcs.	13 items/48 pcs.
Intensive Care Unit	15 items/39 pcs.	8 items/22 pcs.
Urology Unit	10 items/14 pcs.	6 items/ 9 pcs.
Diagnostic Imaging	12 items/20 pcs.	9 items/ 9 pcs.
Clinical Laboratory	19 items/22 pcs.	9 items/11 pcs.
Medical Ward	14 items/26 pcs.	9 items/28 pcs.
Surgical Ward	16 items/26 pcs.	13 items/22 pcs.
Vehicles	1 item / 5 pcs.	0
	Sub:108 items/237 pcs.	Sub:67 items/149 pcs.
Yangon Central Women Hospital		
Operation Theatre	14 items/ 44 pcs.	10 items/37 pcs.
Intensive Care Unit	14 items/ 77 pcs.	7 items/21 pcs.
Neonatal Intensive Care Unit	13 items/232 pcs.	11 items/46 pcs.
Diagnostic Imaging	4 items/ 4 pcs.	4 items/ 7 pcs.
Clinical Pathology & Blood Bank	6 items/ 6 pcs.	4 items/ 5 pcs.
	Sub:51 items/363 pcs.	Sub:36 items/116 pcs.
Yangon Children Hospital		
Operation Theatre	10 items/19 pcs.	10 items/34 pcs.
Intensive Care Unit	9 items/19 pcs.	5 items/12 pcs.
Neonatal Unit	6 items/21 pcs.	6 items/24 pcs.
Diagnostic Imaging	4 items/ 4 pcs.	3 items/ 3 pcs.
Clinical Laboratory	9 items/13 pcs.	5 items/ 7 pcs.
	Sub:38 items/76 pcs.	Sub:29 items/80 pcs.
TOTAL	197 items/676 pcs.	132 items/345 pcs.

2) Equipment Plan

1.Breakdown list of the plan equipment

Based on the above examination and evaluation, the planned equipment for this project is listed in Table 2-9 "Equipment Procurement Plan".

Table 2-9 Equipment Procurement Plan

New Yangon General Hospital

Item No.	Name of Equipment	Quantity
G1: Operation Theatre		
G1-1	Operating Table	4
G1-4	Diathermy (Bipolar)	4
G1-8	Ceiling Lamp, Combination Type	4
G1-9	Anaesthetic Apparatus, w/ventilator	5
G1-10	Bedside Monitor	5
G1-11	Suction Unit	5
G1-12	Infusion Pump	5
G1-13	Syringe Pump	2
G1-14	Defibrillator	2
G1-15	Cardiograph	2
G1-16	Table Top Sterilizer	3
G1-17	Instrument Sterilizer	6
G1-21	Pharmaceutical Refrigerator	1
G2: Intensive Care Unit		
G2-1	ICU Ventilator	4
G2-2	Suction Unit	4
G2-3	Cardiograph	2
G2-6	Pharmaceutical Refrigerator	1
G2-8	Arterial Blood Gas Analyzer	1
G2-13	Defibrillator with Synchronizaion	2
G2-14	Bedside Monitor	6
G2-15	Oxygen Concentrator	2
G3: Urology Unit		
G3-1	Electrosurgical Unit	1
G3-3	Percutaneous Nephroscope	1
G3-4	Pharmaceutical Refrigerator	1
G3-5	Table Top Sterilizer	2
G3-6	Suction Unit	2
G3-10	Instrument Sterilizer	2
G4: Diagnostic Imaging		
G4-1	Whole Body Computed Tomographic System	1
G4-2	Doppler Ultrasound Scanner	1
G4-3	Digital Subtraction Angiography Apparatus	1
G4-4	Portable X-ray Machine	1
G4-5	Ultrasound Maichine with Printer	1
G4-7	Diagnostic X-ray System with TV	1
G4-8	X-ray Film Processor	1
G4-10	C-arm X-ray Unit	1
G4-12	Ganmar Camera System	1
G5: Clinical Laboratory		
G5-6	Auto Still Apparatus	2
G5-10	Blood Cell Counter	1
G5-11	Spectrophotmeter	1
G5-12	Microscope	2
G5-13	Automatic Tissue Processor	1
G5-15	Tissue TEK	1
G5-16	Pharmaceutical Refrigerator	1
G5-17	Centrifuge	1
G5-18	Coagulometer	1

Table 2-9 Equipment Procurement Plan

New Yangon General Hospital

Item No.	Name of Equipment	Quantity
G6: Medical Ward		
G6-1	Defibrillator	2
G6-2	Cardiac Monitor	3
G6-4	Oxygen Concentrator	6
G6-5	Infusion Pump	4
G6-6	Syringe Pump	6
G6-7	Pulse Oximeter	2
G6-9	Suction Unit	2
G6-10	Cardiograph	1
G6-11	Table Top Sterilizer	2
G7: Surgical Ward		
G7-1	Gastrointestinal Fiberscope Unit	2
G7-2	Monitoring System	1
G7-3	Duodenoscope Unit	1
G7-4	Bronchofiberscope Unit	1
G7-5	Light Source for Fiberscope	3
G7-7	Pharmaceutical Refrigerator	1
G7-8	Instrument Sterilizer	2
G7-9	Table Top Sterilizer	1
G7-12	Suction Unit	2
G7-13	Syringe Pump	2
G7-14	Infusion Pump	2
G7-15	Bedside Monitor	2
G7-16	Oxygen Concentrator	2
		149

Table 2-9 Equipment Procurement Plan

Yangon Central Women Hospitral

Item No.	Name of Equipment	Quantity
W1: Operation Theatre		
W1-1	Universal Operating Table for Obs./Gyne.	6
W1-2	Cardiotonogram	4
W1-3	Doppler Fetal Heart Detector	3
W1-5	Laparoscope with Light Source	1
W1-6	Electric Vacuum Extractor	4
W1-8	Diathermy	4
W1-10	Hysteroscope with Light Source	1
W1-12	Delivery Bed	6
W1-13	Suction Unit	4
W1-14	Electrocardiograph	4
W2: Intensive Care Unit		
W2-1	ICU Ventilator	2
W2-3	Defibrillator	2
W2-5	Bedside Monitor	5
W2-6	Syringe Pump	4
W2-7	Infusion Pump	2
W2-12	Suction Unit	2
W2-14	ICU Bed	4
W3: Neonatal Intensive Care Unit		
W3-1	Oxygen Flowmeter Set	10
W3-2	Bilirubinometer, Percutaneous Type	3
W3-4	Intensive Care Warmer	3
W3-5	Continuous Positive Airway Pressure Ventilator	2
W3-7	Infusion Pump	4
W3-8	Syringe Pump	2
W3-9	Suction Unit	2
W3-10	Infant Incubator	8
W3-11	Oxygen Concentrator	10
W3-12	Electrocardiograph	1
W3-13	Portable X-ray Unit	1
W4: Diagnostic Imaging		
W4-1(1)	Ultrasound Scanner	4
W4-1(2)	Ultrasound Scanner with Doppler	1
W4-2	Diagnostic X-ray System w/Fluoroscopy	1
W4-4	Ultrasound Scanner, Portable	1
W5: Clinical Pathology and Blood Bank		
W5-2	Spectrophotmeter	2
W5-3	Auto Still Apparatus	1
W5-4	Automatic Tissue Processor	1
W5-6	Paraffin Section Mounting Water Bath	1
		116

Table 2-9 Equipment Procurement Plan

Yangon Children Hospital

Item No.	Name of Equipment	Quantity
C1: Operation Theatre		
C1-1	Universal Operating Table w/Baby Attachment	3
C1-2	Ceiling Lamp, Combination Type	3
C1-3	Autoclave	1
C1-4	Diathermy	3
C1-5	Anaesthesia Apparatus w/ventilator	3
C1-7	Bedside Monitor	4
C1-9	Infusion Pump	3
C1-10	Blood Transfusion Warmer	3
C1-11	Cardiograph	3
C1-12	Suction Unit	8
C2: Intensive Care Unit		
C2-1	ICU Ventilator for Paediatric	2
C2-2	ICU Ventilator for Infant	2
C2-3	Bedside Monitor	2
C2-7	Infant Incubator	4
C2-9	Oxygen Concentrator	2
C3: Neonatal Unit		
C3-1	Infant Incubator	7
C3-2	Apnea Alarm	5
C3-3	Bedside Monitor	4
C3-6	ICU Ventilator for Infant	2
C3-7	Syringe Pump	4
C3-8	Bilirubinometer	2
C4: Diagnostic Imaging		
C4-1	Diagnostic X-ray System w/TV & Simple X-ray	1
C4-2	Ultrasound System	1
C4-3	Mobile X-ray Unit	1
C5: Clinical Laboratory		
C5-3	Spectrophotometer	1
C5-5	Electrophoresis Apparatus	1
C5-6	Binocular Microscope	3
C5-7	Blood Storage Refrigerator	1
C5-8	Refrigerated Centrifuge	1
		80

2. Specifications of the main equipment

The detailed specifications of main equipment procured in the project are shown in the following Table 2-10.

Table 2-10 SPECIFICATION FOR MAIN EQUIPMENT

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
1	G1-1	Operating table	Type: universal, hydraulic and manual operation Table top: 1,900(L)×450(W)mm Adjustable height: 720-1,000mm or more Trendelenburg: Approx.+/-25° Lateral tilting: Approx. +/-20°	It is used for placing a patient on the table for operation. Unlike an ordinary bed, the operating table can be tilted and rolled to adjust the position of the patient for ease and safety of the operation.	4
2	G1-4	Diathermy (Bipolar)	Function: Cutting,Coagulation, Blend, Bipolar, Foot switch Output Coagulation: 100W or more Cutting: 250W or more Blend: 200W or more Bipolar: 18W or more	An essential tool for operating room, that is used when dissecting the living structure of patients in the operation, when performing hemostatic dissection and for coagulation.	4
3	G1-8	Ceiling Lamp, Combination Type	Number of valve: Main 8pcs or more Sub. 4pcs or more Intensity: Main: 120,000lux or more Sub: 85,000lux or more (It is depended by distance.)	This equipment irradiates with heat-less and shadowless light. Proper colour, temperature and illumination are provided in the operating room.	4
4	G1-9	Anaesthetic apparatus w/ventilator	Vaporizer: halothene and isoflurane Co_2 canister: provided Oxygen monitor: built-in Flow meter: for O2 and N2O Safety devices: built-in With Anaesthesia ventilator	It is equipment used for general anaesthesia for operation. It provides all the basic functions required, including manual controls of oxygen and nitrous oxide. It is also equipped with artificial respirator, because anaesthesiologist will find it difficult to secure respiratory function of a patient under the long-hour operation.	5
5	G1-10 G2-14 G7-15	Bedside monitor	Numeric: electrocardiogram, respiration rate, temperature, pulsation, SpO_2, NIBP, CO2 Display: CRT or LCD Recorder: built-in Wire type	It is used to monitor the circulatory system and respiration of the serious cases, and to record the condition of the patient. In critical condition, it issues the warning to doctors and nurses with alarm. The equipment monitors the condition of the patient at all times instead of the doctor and nurse.	13
6	G1-14 G2-13 G6-1	Defibrillator	Output : 2-360J or wider Monitor: 5 inch or more Buttery charger: built-in Power: DC, AC With Paddle for adults and paediatrics	It is used for the resuscitation in the cardiac arrest. This equipment gives percutaneous countershock with direct current for the ventricular fibrillation, and it stimulates the patient to recover the original rhythm of his heartbeat. It is indispensable to the general hospital.	6

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
7	G2-1	ICU Ventilator	Application: adults Method:pressure method with compressor Ventilation mode: CMV, IMV, PEEP Tidal volume: approx. 200-1000ml	It is a device used for treatment of a patient suffering from difficult breathing or used for respiratory control of a patient after an operation. The device can be used for adults.	4
8	G2-8	Arterial Blood Gas Analyzer	Parameters(Blood gas): pH, pCO2, pO2, (HCO3)	It is used to analyze the blood concentration such as the saturation of oxygen, moisture, and electrolytic concentration, and also used to grasp the respiratory function of the patient.	1
9	G3-1	Electrosurgical unit, (for general endoscopic electricalsurgery)	Function: Cutting, Coagulation, Blend, Monopolar, Bipolar Output Cutting: 300W Blend 1: 250W Blend 2: 200W Coagulation: 100W Bipolar: 70-120W	It is used to make resection, hemostasis and coagulation of the patient's tissue. It is used for the general operation or under the endoscope, and it should meet the specifications suitable for the operation especially of the site with many fine vessels.	1
10	G3-3	Percutaneous nephroscope	Nephroscope: Rigid type Light guide system OP-telescope: Direction of view:5° Ocular angle:45° Consisting Light guide cable Sheath Grasping forcepts Kidney stone punch Ureteroscope: Rigid type Light guide system Direction of view:7° Ocular angle:45° Rezectscope: Rigid type Light guide system Continuos irrigation system	It reaches urinary tract and the renal pelvis, and it enables to make transurethral observation and resection. It is used for the treatment such as prostatectomy by using a high-frequency cauter.	1
11	G4-1	Whole body computed tomographic system	System: Spiral scan Scan time: 0.7(half), 1, 1.5, 2, 3, second Detector: 828ch or more Heat capacity: 3.5MHU or more With laser printer, application	This equipment radiates X-ray in the patient's body from the multiple directions, and measures the X-ray absorptivity. The absorption value is transformed into the tomogram image of the inspection site by computer processing. The diagnosable body section is wide, such as pars intracranialis, thoracic organs, abdominal organs, and the degeneration of the muscle tissue. The utility is also high.	1

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
12	G4-2	Doppler ultrasound scanner	Method: electronic scanning Display mode: B, M, B/M, Doppler Monitor: 15"/Zoom Connection of probe: 3-ch Image memory: provided Probe: convex(3.5MHz), liner(7.5MHz), endorectal with printer and cart	Procurement is planned for the equipment that enables imaging diagnostic with applying ultrasound to around the abdominal part. It is useful equipment to diagnose a change in the patient's body by especially grasping the state of the abdominal organs and the intravascular hemokinesis.	1
13	G4-3	Digital subtraction angiography apparatus	Type: floor mounted type C-arm: Single plane Longitudinal movement: 120cm or more Image processing unit CCD Camera, Monitor High voltage x-ray generator Radiography Tube voltage: up to 125kv or more Tube current: up to 1000mA or more Fluoroscopy Tube voltage: up to 125kv or more Tube current: up to 4mA or more With Injector, Laser printor, Applications	This equipment submits to the angiography and the catheter treatment of the abdominal part. The clinical application layer is wide, and the availability of this equipment is high for the embolectomy of various vessels, the expansion of the narrow segment, and the medicinal abouchement treatment through catheter to the various lesioned parts (tumour and so on).	1
14	G4-4	Portable x-ray machine	Inverter type: high voltage unit Tube voltage range: 40 - 125kv mAs range: up to 125mAs or more X-ray tube focus size: 0.7 - 1.0mm	It is used in serious cases of those patients who are too infirm to go to the X-ray examination room. Since the whole body is the subject of examination, simple radiography is done for each bodily part.	1
15	G4-5	Ultrasound machine with Printer	Method: electronic scanning Display mode: B, M, B/M Monitor: 12inch/black & white Connection of probe: 2-ch Image Memory: provided Probe: Convex (2.5-5.0MHz), Linear (5.0-7.5MHz), Endorectal With foot switch & cart	Detecting and observing the echoes, we can interpret the morphology of specific lesion or the characteristics of affected tissue, etc. It enables us to diagnose the patient.	1
16	G4-7	Diagnostic x-ray system with TV	Type: Local control Max rating: 630mA-150kv or more R/F table: Under tube type Table tilt: 90°/15° or more X-ray tube: 1 tube	It is used to diagnose the affected part of the patient's body such as alimentary canal by the fluoroscopy. Procurement is planned for the model of proximate operation method, which facilitates communication with the patient.	1

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
17	G4-8	X-ray film processor	System: Roller transport Film size: up to 14"x17" Capacity: 220 films, more Processing time: 90 sec.	This equipment automatically makes all the process from development to drying of the films after the X-ray photography, and it enables to shorten the waiting time before the diagnosis.	1
18	G4-10	C-arm x-ray unit with TV	Generator: High frequency inverter Current: 20mA, more Voltage: 110kV, more Tube focusing : 0.5/1.0mm with 2 TV monitors	Used for operations in surgical department. TV monitor is imaged the portion that cannot be seen with an unaided eye will facilitate the oeprations.	1
19	G4-12	Ganmar camera set system	Imaging mode: Spot imaging Whole-body imaging Energy resolution: within 9.6% (99mTC) Intrinsic resolution: within 3.7mm (FWHM, 99mTC) Uniformity: within 2.3%(Diff) Linearity: wirhin 0.2mm(Diff)	Applying the property that radioactive material is concentrated on the neoplasm, the radioactive substance is injected into the subject internally (brain and heart), and it detects the gamma radiation which emitted from such radioactive substance. It is used to diagnose the lesioned part and the size of the neoplasm by imaging the data analysis of the computer.	1
20	G5-10	Blood cell counter	Parameters: WBC,RBC,etc. 18items in total Throughput: 60samples/hour, more Sample volume: Approx.50micro-lit.	It is used to diagnose the diseases by the inspection of blood component (blood corpuscle, thrombocyte and leukocyte).	1
21	G5-11	Spectrophotometer	Measured wavelength range: Approx. 195-999nm Spectral band weight: Approx. 5nm Wavelength indication: Approx. 0.1nm Accuracy: Approx. within 1nm with Autosampler and sipper system	Routine biochemical inspections in clinical examination rooms are performed efficiently by using a semiautomatic spectrophotmeter.	1
22	G5-13	Automatic tissue processor	Type: Rotary type No.of stations: 12 or more Timer: 0 - 24hrs, more	It usually takes 1 week to follow all the procedures of dehydration, degrease, and infiltration into the paraffin. This equipment automatically takes these procedures, and immobilizes the tissue slice onto the paraffin.	1
23	G7-1	Gastrointestinal fiberscope unit	Field of view: 100°or more Outer diameter: 9.8mm Working length: 1025mm Dia of instrument channel: 2.8mm	It is used for the observation and the treatment of the upper digestive tract (stomach and duodenums). Forceps channel is equipped, and it enables to make a treatment by using the various forceps under the endoscope.	2
24	G7-2	Monitoring system	Inter-line type CCD: Provided Imaging system: PAL With Camera head	It is used to diagnose the image from the endoscope on the TV monitor. It is available even for an educational use, because it can show the image to many people.	1

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
25	G7-3	Duodenoscope unit	Field of view: 80° approx. Side viewing: 10°- 15° Working length: 1,230mm or more Outer diameter: 10-12mm Dia of instrument channel: 3.2 - 4.2mm With suction, biopsy forcepts and grasping forcepts	It is used for the internal inspection of the upper digestive tract (duodenums). It is especially useful for the diagnosis of the ulcer and the neoplasm, and further inspection can be made in histopathology.	1
26	G7-4	Bronchofiberscope unit	Field of view: Approx. 120° Outer diameter: Approx. 5.8mm Working length: Approx. 550mm Dia of insturment channel: Approx. 2.2mm	It is used for endoscopic diagnosis and biopsy of bronchial diseases.	1
27	W1-1	Universal Operating table for obs./gyne.	Application: Gynecology Type: hydraulic and manual operation Table top: 1,900(L)×450(W)mm Adjustable height: 720-1,000mm or more Trendelenburg: Approx.+/-25° Lateral tilting: Approx. +/-20°	It enables to place a patient in an appropriate posture on the table for operation.	6
28	W1-2	Cardiotonogram	Measuring item: Fetal heart rate Uterine contraction Measuring method: Pulse Doppler Measuring range: 50-210bpm	It is used in the labor room and the delivery room, and it is used to monitor the heart action of the fetus and the condition of the woman in the childbirth. It is indispensable for the safe delivery.	4
29	W1-5	Laparoscope set with light source	Telescope: Light guide type Direction of view:12° Field of view: Approx. 45° Outer diameter: Approx. 10mm Working length: Approx.300mm	A trocar is stabbed into the abdominal part, and it is used for the abdominal diagnosis and the treatment of organs by inserting telescope and forceps through the trocar.	1
30	W1-8	Diathermy	Function: Cutting,Coagulation, Blend, Bipolar, Foot Switch Output Coagulation: 100W or more Cutting: 250W or more Blend: 200W or more Bipolar: 18W or more	An essential tool for operating room, that is used when dissecting the living structure of patients in the operation, when performing hemostatic dissection and for coagulation.	4

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
31	W1-10	Hysteroscope set wight light source	Hysteroscope: Rigid type Light guide system Telescope: Direction of view:12° Consisting Working element Light guide cable Sheath, Handle Resection electrode	Hysteroscope: It is used for the observation of intrauterine and oviduct. Resectoscope: It is used for the treatment of endometriosis by using a high-frequency cauter.	1
32	W2-1	ICU Ventilator	Application: adults Method: volume method with compressor Ventilation mode: CMV, IMV, PEEP Tidal volume: approx. 200-1000ml	It is a device used for treatment of a patient suffering from difficult breathing or used for respiratory control of a patient after an operation. The device can be used for adults.	2
33	W2-3	Defibrillator	Output : 2-360J or wider Monitor: 5 inch or more Buttery charger: built-in Power: DC, AC With Paddle for adults and paediatrics	It is used for the resuscitation in the cardiac arrest. This equipment gives percutaneous countershock with direct current for the ventricular fibrillation, and it stimulates the patient to recover the original rhythm of his heartbeat. It is indispensable to the general hospital.	2
34	W2-5	Bedside monitor	Numeric: electrocardiogram, respiration rate, temperature, pulsation, SpO_2, NIBP, CO2 Display: CRT or LCD Recorder: built-in Wire type	It is used to monitor the circulatory system and respiration of the serious cases, and to record the condition of the patient. In critical condition, it issues the warning to doctors and nurses with alarm. The equipment monitors the condition of the patient at all times instead of the doctor and nurse.	5
35	W3-4	Intensive care warmer	Skin temperature control: servo-control (manual possible) Temperature range: Approx.35-38℃ Alarm: high/low temperature	It is a table for taking care of new-born babies after delivery.	3
36	W3-5	Continuous positive airway pressure ventilator	Application: Premature/Infant System: CPAP Flow volume: 0-15lit./min. O2/Air mixer: 0-100% O2 monitor: Built-in Alarm function: Provided Safety device: Provided	It is a device used for treatment of an infant patient suffering from difficult breathing or for the respiratory control of a patient after operation, etc. The device can be used for new-born babies.	2
37	W3-10	Infant incubator	Type: Manual Incubator temp. setting: Approx. 25-38℃ Wall temperature: Approx. 20-42℃ Humidity: Approx. 20-99%	It is used for new-born babies who are low weight, and keeps them in the most suitable condition.	8

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
38	W3-13	Portable x-ray unit	Inverter type: high voltage unit Tube voltage range: 40 - 125kv mAs range: up to 125mAs or more X-ray tube focus size: 0.7 - 1.0mm	It is used in serious cases of those patients who are too infirm to go to the X-ray examination room. Since the whole body is the subject of examination, simple radiography is done for each bodily part.	1
39	W4-1 (1)	Ultrasound scanner	Method: electronic scanning Display mode: B, M, B/M Monitor: 12inch/black & white Magnification zoom Probe: Convex (2.5-5.0MHz), Linear (5.0-7.5MHz), Endorectal With foot switch & cart	Detecting and observing the echoes, we can interpret the morphology of specific lesion or the characteristics of affected tissue, etc. It enables us to diagnose the patient.	4
40	W4-1 (2)	Doppler ultrasound scanner	Method: electronic scanning Display mode: B, M, B/M, Doppler Monitor: 15"/Zoom Connection of probe: 3-ch Image memory: provided Probe: convex (3.5-5.0MHz), liner (5.0-8.0MHz), endorectal with printer and cart	Procurement is planned for the equipment that enables imaging diagnostic with applying ultrasound to around the abdominal part. It is useful equipment to diagnose a change in the patient's body by especially grasping the state of the abdominal organs and the intravascular hemokinesis.	1
41	W4-2	Diagnostic x-ray system with Fluoroscopy	Type: Local Control Max rating: Approx. 630mA-150kva R/F table: under tube tupe Fluoroscopic table (90˚/15˚ more) Floor loading X-ray unit X-ray tube: 1 tube Bucky stand	It is used to diagnose the affected part of the patient's body such as alimentary canal by the fluoroscopy. Procurement is planned for the model of proximate operation method, which facilitates communication with the patient.	1
42	W4-4	Ultrasound scanner, portable	Method: Electronic scanning Display mode: B, M, B/M Monitor: 9 inch or more Black & white Connection of Probe: 2-ch Probe: Convex (3.5MHz), Transvaginal (5.0-7.0MHz) With printer and cart	It is used for the pregnancy diagnosis and the progress diagnosis in the obstetrics. Procurement is planned for the portable type, which is easy to carry.	1
43	W5-2	Spectrophotometer	Measured wavelength range: Approx. 195-999nm Spectral band weight: Approx. 5nm Wavelength indication: Approx. 0.1nm Accuracy: Approx. within 1nm with Autosampler and sipper system	Routine biochemical inspections in clinical examination rooms are performed efficiently by using a semiautomatic spectrophotometer.	2

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
44	C1-1	Universal operating table w/baby attachment	Application: Pediatrics Type: Hydraulic and manual operation Position: 3 positions X-ray photograph: possible Table top: .1,900(L)×450(W)mm Adjustable height: 720-1,000mm	It is used for placing a patient on the table for operation. Unlike an ordinary bed, the operating table can be tilted and rolled to adjust the position of the patient for ease and safety of the operation.	3
45	C1-2	Ceiling lamp, combination type	Number of valve: Main 8pcs or more Sub. 4pcs or more Intensity: Main: 120,000lux or more Sub: 85,000lux or more (It is depended by distance.)	This equipment irradiates with heat-less and shadowless light. Proper colour, temperature and illumination are provided in the operating room.	3
45	C1-3	Autoclave	Chamber size: Approx.500(W)x500(H) x900(D)mm Door type: Single Capacity: 220lit.,more Sterilize temp.: 132°C or more Electric steam generator: Incorporated	It is basic equipment of the Central Material Room, which sterilizes the surgical instrument and the linens used in the hospital by high-pressure steam.	1
47	C1-4	Diathermy	Function: Cutting,Coagulation, Blend, Bipolar Output Coagulation: 100W or more Cutting: 250W or more Blend: 200W or more Bipolar: 18W or more	An essential tool for operating room, that is used when dissecting the living structure of patients in the operation, when performing hemostatic dissection and for coagulation.	3
48	C1-5	Anaesthesia apparatus w/ventilator	Vaporizer: halothene and isoflurane Co_2 canister: provided Oxygen monitor: built-in Flow meter: for O2 and N2O Safety devices: built-in With Anaesthesia ventilator	It is equipment used for general anaesthesia for operation. It provides all the basic functions required, including manual controls of oxygen and nitrous oxide. It is also equipped with artificial respirator, because anaesthesiologist will find it difficult to secure respiratory function of a patient under the long-hour operation.	3
49	C1-7 C2-3 C3-3	Bedside monitor	Numeric: electrocardiogram, respiration rate, temperature, pulsation, SpO_2, NIBP, CO2 Display: CRT or LCD Recorder: built-in Wire type	It is used to monitor the circulatory system and respiration of the serious cases, and to record the condition of the patient. In critical condition, it issues the warning to doctors and nurses with alarm. The equipment monitors the condition of the patient at all times instead of the doctor and nurse.	10

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
50	C2-1	ICU Ventilator for paediatric	Application: Pediatrics Mode: CMV, IDV, PEEP, CPAP or more Tidal volume: 50-1300ml or more Inspiratory time: 0.5 to 3.0 or wider Oxygen concentration: Approx.21-100% With compresor and humidifier	It controls respiration of the patient whose respiratory function is at a standstill or falls.	2
51	C2-2 C3-1	ICU Ventilator for infant	Application: infant Mode: CMV, IDV, PEEP, CPAP, Manural-operation or more Tidal volume: 0-1000ml Inspiratory time: 0.1 to 3.0 Oxygen concentration: Approx.21-100% With compresor and humidifier	It controls respiration of the patient whose respiratory function is at a standstill or falls.	4
52	C2-7 C3-1	Infant incubator	Type: Manual Incubator temp. setting: Approx. 25-38℃ Wall temperature: Approx. 20-42℃ Humidity: Approx. 20-99%	It is used for new-born babies who are low weight, and keeps them in the most suitable condition.	11
53	C4-1	Diagnostic x-ray system with TV & Simple x-ray	Type: Local control for Fluoroscopy Remote control for Radiography Max rating: 630mA-150kv or more R/F table: Under tube type Table tilt: 90°/15° or more X-ray tube: 2 tubes With local TV monitor, Bucky stand and table	It is used to diagnose the affected part of the patient's body such as alimentary canal by the fluoroscopy. The model of proximate operation method, which facilitates communication with the patient, is planned. Procurement is planned for the system with 2 X-ray tubes in order to form a unit component which also enables to make plain radiography in this hospital.	1
54	C4-2	Ultrasound system (with doppler)	Method: electronic scanning Display mode: B, M, B/M, Doppler Monitor: 15"/Zoom Connection of probe: 3-ch Image memory: provided Probe: convex(2.5-5.5MHz), liner(5.0-10.0MHz), sector(2.0-5.0MHz) with printer and cart	Detecting and observing the echoes, we can interpret the morphology of specific lesion or the characteristics of affected tissue, etc. It enables us to diagnose the patient.	1
55	C4-3	Mobile x-ray unit	Inverter type: high voltage unit Tube voltage range: 40 - 125kv mAs range: up to 125mAs or more X-ray tube focus size: 0.7 - 1.0mm	It is used in serious cases of those patients who are too infirm to go to the X-ray examination room. Since the whole body is the subject of examination, simple radiography is done for each bodily part.	1

	ITEM NO.	DESCRIPTION	SPECIFICATION	APPLICATIONS	Q'TY
56	C5-3	Spectrophotometer	Measured wavelength range: Approx. 195-999nm Spectral band weight: Approx. 5nm Wavelength indication: Approx. 0.1nm Accuracy: Approx. within 1nm with Autosampler and sipper system	Routine biochemical inspections in clinical examination rooms are performed efficiently by using a semiautomatic spectrophotometer.	1
57	C5-8	Refrigerated centrifuge	Max.speed: 7,000rpm or more Max.capacity: 1,160ml or more Display: Digital Tempreature setting: -10 to 30°C	It is used to analyze each proteoclastic enzyme and component based on the mobility gap in the electrophoresis.	1