

## **CHAPTER 1**

### **BACKGROUND OF THE PROJECT**

## **CHAPTER 1. BACKGROUND OF THE PROJECT**

### **1-1 Background of Grant Aid Request**

Myanmar's Ministry of Health plans to restore the proper functions of Yangon General Hospital through enhancement of operation, maintenance, and management capabilities; improvement of facilities and equipment; and renewal or supplementation of deteriorated equipment. Because procurement of equipment by self-help is difficult due to the hard economic circumstance, the Ministry requested assistance from Japan.

As discussed before, Yangon city is experiencing a rapid increase in the number of emergency patients presenting with injuries from traffic accidents reflecting the increase in registered vehicles, other injuries, intoxication, etc. Yangon General Hospital is positioned as the top referral hospital, which accepts patients beyond the ability of primary- and secondary-level medical facilities. Staffed with specialists in 27 branches of medicine, the hospital also accepts patients referred from other facilities. The need for improvement is urgent, particularly in the emergency and outpatient departments.

This project is intended to facilitate effective and timely restoration of the hospital's functions and thus to improve the medical care services for emergency patients and outpatients through assistance in procurement of necessary equipment in line with the facility and equipment improvement plans, which are scheduled to be conducted at the emergency and outpatient departments of Yangon General Hospital.

### **1-2 Outline of Grant Aid Request**

The outline of the grant aid request from Myanmar is as follows:

#### **(1) Purpose of Request**

The purpose of this request is to facilitate more effective and efficient restoration of the hospital's functions and thus to improve the quality of medical services through procurement of necessary equipment for the emergency and outpatient departments of Yangon General Hospital.

#### **(2) Implementing Organ**

The implementing organ of this project is Myanmar's Ministry of Health.

### (3) Description of Request

Date of request: May 2000.

Target site: Emergency Reception Center of Yangon General Hospital

Requested equipment: Total 261 items

#### X-ray and Darkroom

CT scanner, Laser Imager, X-ray fluoroscopes, General X-ray Unit, Film illuminator, Ultrasound apparatus, Automatic film processor for general purpose, Automatic film processor for dental, Pass box, etc.; total 26 items.

#### Laboratory

Dry-chemical analyzer, Blood cell counter, Blood gas analyzer, Electrolyte analyzer, Coagulometer, Spectrophotometer, Binocular microscope, Centrifuge, Water bath, Incubator, Blood bank refrigerator, Medical refrigerator, Electronic balance, etc.; total 19 items.

#### Emergency Receiving Center I

ECG, Defibrillator, Suction unit, Infusion pump, Diagnostic light, Film illuminator, Instrument cabinet, Instrument cart, etc.; total 17 items.

#### Emergency Receiving Center II

Operation Table, C-arm X-ray unit, Anesthesia apparatus with ventilator, Defibrillator, Bedside monitor, Electrosurgical unit, Suction unit, Operation microscope, Operation light (ceiling type), Operation light (mobile type), Film illuminator, Fiber-scopes (Gastrointestinal, Duodeno, Choledocho, Colono, etc.), Stretcher trolley, Surgical scrub station, Ventilator, Central monitor, ICU Bed, Surgical Instrument set, etc.; total 137 items.

#### Others; Common Department

High pressure steam sterilizer, Ultrasound apparatus for general purpose, ECG, Diagnostic light, Diagnostic scope set, Film illuminator, Dental chair unit with compressor and aspirator, X-ray unit for dental, Ambulance with accessories, Stretcher trolley for Emergency, Mortuary locker, Computer with printer, Copy machine, etc.; total 62 items.

## **CHAPTER 2**

### **CONTENTS OF THE PROJECT**

## CHAPTER 2. CONTENTS OF THE PROJECT

### 2-1 Basic Concept of the Project

#### (1) Overall goal and Project purpose

Although the number of emergency patients and out-patients in the city of Yangon is increasing, the emergency/out-patient department of the Yangon General Hospital, Myanmar's top referral facility, is not able to operate as it ought to because of its insufficient and run-down medical equipment. That being the case, the goal of the present project is that of improving the recuperation of emergency patients and out-patients in Yangon by restoring that department's capability to operate properly through furnishing of that hospital with the medical equipment that it needs. The upper-hierarchy goal and the goal of the project are therefore the following:

- Overall goal: Improvement of recuperation of emergency patients and out-patients in Yangon
- Project purpose: Enhancement of medical service in the emergency/out-patient department of the Yangon General Hospital

#### (2) Outline of the Project

In the project the necessary inputs and activities for attainment of the upper-hierarchy goal and the outputs that are hoped for the sake of attainment of the goal of the project are planned as follows.

##### 1) External Conditions

- 1) Timely procurement of the purchased equipment (smooth accomplishment of customs clearance, transportation, procurement formalities, etc.).
- 2) Timely completion of infrastructure work accompanying installation of the equipment.
- 3) Securing of the necessary funds for the infrastructure work, customs duties exemption measures, removal of the existing equipment, etc.
- 4) Establishment of adequate equipment control and management system (system for control of equipment and materials, system for accomplishment of maintenance, etc.).

##### 2) Inputs

- ① Myanmar side: Securing of funds for infrastructure work, operation and maintenance, accomplishment of building repairs and procurement of medical supplies, consumables, etc.
- ② Japanese side: Procurement, installation and handing over of the equipment needed by the emergency/out-patient department.

3) Activities

- ① Implementation of training for enhancement of medical care service to emergency patients and out-patients.
- ② Holding of regular meetings of the working committees of the emergency/out-patient department.
- ③ Setting up of training committee for maintenance of the equipment and drawing up and carrying out a training program.

4) Outputs

- ① Enhancement of diagnosis and treatment functions of the emergency/out-patient department.
- ② Concentration of functions for more efficient operation and maintenance.
- ③ Reduction of patient load and making it possible to cope with increase in the number of patients through enhancement of diagnosis and treatment functions.

## **2-2 Basic Design of the Requested Japanese Assistance**

### **2-2-1 Design Policy**

#### **(1) Overall Policy**

The existing Emergency Receiving Center consists of examination rooms and treatment rooms, and in some cases that is adequate for patients who are not very seriously ill, but for serious cases it is also necessary to have examination by radiological or ultrasonic diagnosis and other equipment as well as treatment in operating rooms, observation rooms and other facilities. Furthermore, rather than being of a content implemented independently by itself, such medical care activities have to be provided as a series of medical services.

In the initial request the facility covered was only the Emergency Receiving Center, but for the sake of provision of effective assistance it is also necessary to provide for incidental test functions (radiological tests, ultrasonography tests, etc.) and treatment functions (operating table, shadowless lamp, anesthesia machine, patient monitoring systems, etc.), and therefore it has been decided to have the project cover the out-patient department as a whole, including emergency patients. The project equipment plan has been formulated on the basis of the following policies:

- 1) Abiding by the principle of replacement of deteriorated equipment and filling equipment shortages.
- 2) Making the plan such that it will not impose an extreme burden on the other side's implementation system (personnel allocation, budget measures, technical level, etc.).
- 3) Having the equipment provided have basically the same grade as the existing equipment as regards specifications.
- 4) Exclusion of equipment items that it is considered that Myanmar is capable of procuring itself in order to encourage self-help efforts on its part.

Furthermore, in this basic design study it was found that besides the department's medical equipment, there are many problems concerning its electrical equipment, including extreme deterioration of the transformers, which have been in service for more than 35 years, the generator and the distribution cables, insufficient power receiving capacity and failure to ensure safety. That being the case, a transformer, a generator, distribution panels and other electrical equipment have been included in the equipment plan to improve that situation regarding the department's electrical equipment in order to make it possible to use the medical equipment furnished in the project in an effective and safe manner. However, the wiring work after the distribution panel, procurement of the air conditioning equipment, the installation work, the repair work, etc. have been left as the responsibility of the other side.

## (2) Policy Regarding Different Departments or Equipment

### 1) Basic Design Policy

In formulation of the equipment plan it is intended to avoid putting too much of a burden on the other side's implementation system (personnel allocation, budget measures, technical level, etc.) while abiding by the principle of replacing deteriorated equipment and filling equipment shortages. As regards equipment specifications, the basic policy is that the new equipment be of the same grade as the existing equipment. The present situation regarding the main equipment and a description of the equipment to be included in the plan are presented below.

### 2) Policy of Main Equipment

#### ① Operating room equipment

Present situation:

There are three operating rooms, all three of which have a high rate of use because of considerable increase in the number of patients. The operations carried out in them are mainly emergency trauma, emergency surgery and orthopedic surgery, and one of the operating rooms is used for operations on patients with infectious diseases.

Most of the planned equipment is for replacement of deteriorated equipment, but since for monitoring of patients use is presently being made of pulse oxymeters, which can measure only oxygen concentration in the blood, it has been decided to include in the project patient monitors, which are essential for operations. Since the same equipment is already being fully used in the ICU, the CCU and elsewhere, it has been judged that there will be no problem with installing them in the operating rooms as well.

The instruments sets consist of the forceps and other instruments for general surgery and orthopedic surgery, and they are meant for replacement of existing instruments.

Planned Equipment:

Operation Light, Operation table, Patient Monitor, Anesthetic Apparatus (with Ventilator), Instrument Set, Suction Unit, Sterile Hand-washing Equipment, Sterilizer (Table top), Defibrillator



## ② Radiophotography equipment

### Present situation:

As the existing equipment of the radiation department there are six general radiophotography apparatuses, but all of them have been used for at least 15-20 years. Therefore two general radiophotography apparatuses will be included in the planned equipment for replacement of such existing equipment as the minimum number needed for coping with emergency patients and out-patients. Those two apparatuses will be installed in the emergency/out-patient department in view of the fact that presently emergency patients and out-patients have to be moved to the neighboring radiation department in spite of the inappropriateness of the line of movement. As for transillumination photographic apparatus for general out-patients, it has already been introduced in recent years and therefore has not been included in the equipment to be furnished in the project.

The existing ultrasonic diagnosis apparatus, supplied by an individual contribution, is the only such apparatus in the hospital and is not quantitatively sufficient to cope with the growing number of emergency patients and general out-patients. Since in the present situation patients that need ultrasonic examination have to be referred to other facilities and transported there and back, it has been decided to include one general-purpose ultrasonic diagnosis unit in the equipment plan for installation in the department in question.

### Planned Equipment:

X-ray Unit, Ultrasonic Scanner, etc.

## ③ Laboratory equipment

### Present situation:

Since the general testing, blood testing and pathological testing equipment in laboratory has to a certain extent been adequately furnished by NGOs, other organizations and individuals, only the deteriorated biochemical analyzer will be replaced in this project.

### Planned Equipment:

Biochemical Analyzer

④ Electrical equipment

Present situation:

The electrical equipment in the department in question is even more deteriorated than the medical equipment, the transformers having been in service for more than 35 years. The generator and distribution panels and other related equipment are in the same condition, and there are problems concerning the capacity, stability, safety and other aspects of the transformers for receiving commercial electric power. In this project it is therefore intended to furnish the transformers, generator and distribution panels within the facility in question and other necessary electrical equipment for safe and effective use of the medical equipment to be supplied.

Work has already started as the Myanmar side's responsibility on a transformer room for accommodation of the electrical equipment, wiring work within the facility in question, installation of air conditioning equipment and facility repairs for centralization of functions, and it is scheduled to be completed in February 2001.

Planned Equipment:

Electrical System (Receiving Transformer, AVR, Generator, Distribution Panel, Cable between each facilities and equipments, etc.)

⑤ CT scanner

There are only two public medical care facilities in Yangon that have CT scanners: Yangon General Hospital, the facility covered by this project, and the New Yangon General Hospital. The CT scanner at the New Yangon General Hospital was installed about 14 years ago, and it is highly probable that in the near future it will no longer be able to function properly. Furthermore, since there are no specialized physicians there, after the testing the patient has to be transported to the referral medical facility.

At the same time patient demand is very high in view of the fact that there are specialized physicians at the hospital in question, the fact that 24-hour duty has been established for receiving emergency patients and the fact that the patients can get treatment there at comparatively low charges. It is therefore judged to be very urgent to provide a new replacement CT scanner in this project. In view of Yangon's population of about 5.4 million, the rate of use of its CT scanners is extremely high.

Since the cost sharing concept introduced in 1997 is taking root, it is considered that there are no particular problems concerning operating and maintenance expenses. There are two regular neurosurgeons there who are responsible for control of

the CT scanners. Since they have received CT training in Japan and have more than 17 years of experience in CT operation, it can be considered that a certain technical level has been attained.

(3) Policy Regarding Natural Conditions

Although there is no need to change the specifications of the equipment from the standpoint of natural conditions, it will be necessary to install automatic voltage stabilizing apparatuses on equipment considered to be vulnerable to voltage fluctuation in view of the fact that voltage fluctuation there is considerable. Specifically, such vulnerable equipment includes patient monitors, ventilators, ventilators (portable), anesthesia apparatuses (with ventilators) and ultrasonic diagnosis units. Since Yangon has a hot, humid climate, the other side will be responsible for installing air conditioning equipment in the operating rooms, radiation rooms, ultrasonic testing room and elsewhere where it is needed.

(4) Policy Regarding Utilization of Local Suppliers and Contractors and Local Equipment and Materials

About the only things relating to medical equipment produced in Myanmar are equipment stands and cabinets and particular equipment. The agencies that deliver to hospitals covered by projects are representatives of Japanese or Western manufacturers, and most of them are located in Yangon. In this project the equipment will be imported from abroad, and the choice will go to manufacturers who have an agency in Yangon and who will be producing and supplying spare parts and consumables, etc. for at least 5 years. In selecting the equipment from among what is available from Japanese and third-party manufacturers, consideration will be given to ease and sureness of upkeep and maintenance and compatibility with the equipment that the hospital in question already has.

(5) Policy Regarding Dealing With the Maintenance Capability of the Implementing Organization

Regarding operating funds and the technical level of those who will be using it, none of the equipment to be furnished should pose any difficulties in handling it after implementation of the project since it will be limited to replacement of existing equipment and some quantitative supplementation thereof. However, since some of the medical equipment to be supplied is sophisticated, it will be necessary for the hospital side to conclude equipment maintenance contracts with the manufacturers to ensure that they can continue to be used for a long time.

(6) Policy Regarding the Period of the Work Relating to Installation of the Equipment

It will be necessary to bring in the planned equipment after checking that the facility repairs work for installation thereof has been completed. The equipment arrangement and the

installation work will be planned so as to be able to complete the work in an efficient manner and a short time without interfering with the hospital's daily operation. In the case of large medical treatment equipment that requires installation work, full arrangements will be made at the manufacturer's plant before shipment for the purpose of reducing the amount of time that is needed for installation.

(7) Policy Regarding Setting of Equipment Scope and Grade

Since the project involves basically only replacement of existing equipment and supplementation of quantitative deficiencies, the grade will be the same as that of the existing equipment. Regarding the CT, however, in view of the fact that the existing equipment is second-generation equipment of the rotate/rotate type, judged to be inappropriate for the emergency department, the spiral type will be considered.

(8) Equipment Considerations at the Time of Study of Basic Design

The basic design survey team explained the priority principles and the exclusion principles applying to selection of the equipment to the Myanmar side, and it accepted them. They also accepted the fact that the policy for selection of the equipment in this project is, in principle, replacement of deteriorated equipment and some quantitative supplementation. They therefore agreed to the specifications of the equipment being the same as those of the existing equipment. However, it was decided to adopt the spiral type of CT scanner, which is more suited to the emergency department than the existing type.

In the survey of manufacturer agencies it was found that, besides several agencies of Japanese manufacturers located in Yangon, there are also agencies of third-party countries that have plenty of experience working there and adequate technical staffs with lots of experience and that distribution of spare parts and consumables is smooth. That being the case, consideration has been given to inclusion of some third-party country products among the equipment to be furnished in this project.

It has been decided to formulate the equipment layout planning in line with the repair plans for centralization of hospital functions that the hospital side has adopted. The consultant has checked the drawings of those hospital repair plans and provided the hospital side guidance concerning the primary side work that will be needed for installation of the equipment, and the hospital side has partially revised those repair plans in accordance with that advice. Specifically speaking, the proposed plan for equipment allocation was presented and the important points concerning to the electric wiring, the position of partition walls and the air conditioning equipment necessary for the plan were provided.

The equipment to be included in the project will be selected on the basis of the above considerations and judgment concerning the hospital's patient demand, personnel plans, the content of that equipment and the hospital's technical level as well as the equipment design policies and results of the study and discussions.

## **2-2-2 Basic Plan**

### **(1) Overall Plan**

#### **1) Environment**

The Yangon General Hospital is located near the city's downtown district, its front entrance facing on the main thoroughfare Bojo Aun Sang Avenue. There is always a lot of pedestrian and vehicle traffic in front of the hospital because of nearby schools, markets, etc. Furthermore, since the hospital has in the past undertaken a whole series of new building and revamping work without any master plan, the CT room, the radiation examination room, the clinical testing room, the ICU and other places that emergency patients and out-patients have to visit are all located in separate buildings. Because of that situation the Myanmar side has plans for repair work aimed at centralization of those different functions.

In order to make possible more efficient and effective operation and maintenance of the functions necessary to emergency patients and out-patients, selection of the necessary equipment and the plans for layout thereof have been studied in line with those centralization plans adopted by the hospital side. It is necessary that the planning be such as to make it possible for emergency patients and out-patients to receive the examination, testing and treatment that they need within the same grounds and without having to go from building to building.

#### **2) Situation Regarding Provision of Infrastructure**

Regarding the emergency/out-patient department building interior, it has already been included in the Myanmar side's repair plans. But since in the local survey it was found that the electric power receiving and transformation equipment is no longer in a state that ensures safety after more than 35 years in operation and that the power receiving capacity is in itself insufficient, resulting in power outages from time to time and other problems, in this project the Japanese side is to take care of procurement of the necessary power receiving and transformation equipment and its installation. However, the plans call for continuation of the other side's efforts in the way of interior wiring, installation of air conditioning, etc.

#### **3) Air Conditioning and Gas for Medical Treatment**

Regarding air conditioning equipment, which is the responsibility of the Myanmar side, in the discussions at the time of study of basic design of the project it was decided that such equipment is to be installed in the operating rooms, the ICU, the CT room, the radiation room, etc. Regarding medical treatment gases (oxygen, laughing gas, etc.) as well, that is to be included in the repair work to be done by the Myanmar side.

#### 4) Emergency Operating Rooms

There are three operating rooms for major operations and one operating room for minor operations. As in the case of the existing equipment, there will be one operating table in each of the operating rooms for major operations, but the equipment plan calls for two operating tables in the operating room for minor operations in view of the comparatively large number of operations there. In addition, the equipment to be provided will include shadowless lamps, electric scalpels, anesthesia apparatuses, aspirators, etc., all for replacement of existing equipment.

#### 5) ICU Room

In the present situation there are insufficient beds for treatment, aspirators, etc. before and after operations. That being the case, there will be provision of 5 ICU beds and ventilator, patient monitoring systems, ultrasonic neblizer, etc. for care, observation and treatment of patients after operations until their condition stabilizes.

#### 6) CT Room and Radiation Room

In the existing radiation room there is X-ray unit of multipurpose fluoroscopic system and general X-ray unit, but it is already beyond repair. That being the case, that equipment will be removed and replaced by a CT scanner, general X-ray unit, dark room equipment, etc. There is also a CT scanner (spiral type) in a different building of the existing facility, but the line of movement between the two places is bad. By installing the most useful CT in the emergency department on the same grounds it will be possible to strengthen diagnosis functions as well as improving that situation.

Furthermore, regarding general X-ray unit, which is most needed by general out-patients, about a 100 of which visit the hospital on an average day, the equipment plan calls for installation of two units. By putting the present two dark rooms together in one place, the plan will not only improve patient movement lines but also reduce examination and waiting time and cut operation and maintenance expenses.

Since in the existing facility sufficient consideration is not given to protection against X-rays, there being a high probability of X-ray leakage through the brick block wall, this project will include procurement of X-ray protection sheet, lead glass and doors containing lead. That being the case, at the time of deciding the working design it will be necessary to fully explain to the Myanmar side the content of the work that will be necessary and to make sure that the equipment can be smoothly installed at the time of delivery.

## 7) Power Receiving and Transformation Equipment

It is intended that equipment in this plan should include incoming transformers, generators, cables to on-site power switchboards and generating rooms due to that existing power receiving transformers become aging and are in serious conditions, that they are currently lack in power incoming capacity and that blackouts often occur. The electric cabling for rooms beyond on-site power switchboards should be executed at cost of the Myanmar side. The cabling has already started as a part of the repair works in the hospitals.



## (2) Equipment Plan

The requested equipment, which was reviewed under the above policy, is shown in Table 3-1.

**Table2-1 List of the planning equipment**

Sr. No.	Department	Room	Item No.	Description	Requested Qty	Existing Qty	Working Situation of Existing Equipment			Planned Qty	Remarks
							Working	Repairing	No-working		
1	ERC-I	Consultation & treatment	1	ECG, Portable type	1	1	1			0	Common use in First aid & treatment room
2	ERC-I	Consultation & treatment	2	Defibrillator	1	0				0	
3	ERC-I	Consultation & treatment	3	Suction unit	3	1		1		1	
4	ERC-I	Consultation & treatment	4	Infusion pump	3	0				0	
5	ERC-I	Consultation & treatment	5	Diagnostic light	3	2	2			0	
6	ERC-I	Consultation & treatment	6	Diagnostic scope set	2	1	1			0	
7	ERC-I	Consultation & treatment	7	Boiling sterilizer, table top type	1	0				0	
8	ERC-I	Consultation & treatment	8	Film illuminator, mobile type, 2 film	2	1	1			0	
9	ERC-I	Consultation & treatment	9	Medical refrigerator	1	0				0	
10	ERC-I	Consultation & treatment	10	Sphygmomanometer, table top type	3	1	1			1	
11	ERC-I	Consultation & treatment	11	I.V. Hanger stand	6	2	2			0	
12	ERC-I	Consultation & treatment	12	Resuscitation bag set	2	1	1			0	
13	ERC-I	Consultation & treatment	13	Instrument cabinet	3	1	1			1	
14	ERC-I	Consultation & treatment	14	Emergency cart	2	0				0	
15	ERC-I	Consultation & treatment	15	Instrument cart	4	1	1			1	
16	ERC-I	Consultation & treatment	16	Basin with stand	3	0				0	
17	ERC-I	Consultation & treatment	17	Basic instrument set	2	0				0	Duplicated with No.10
18	ERC-II	First aid & treatment	1	C-arm X-ray unit, mobile type	1	0				0	
19	ERC-II	First aid & treatment	2	X-ray unit, mobile type	1	0				0	
20	ERC-II	First aid & treatment	3	ECG, Portable type	3	1		1		1	
21	ERC-II	First aid & treatment	4	Ultrasound apparatus, portable type	1	0				0	
22	ERC-II	First aid & treatment	5	Hospital bed	11	10	10			0	
23	ERC-II	First aid & treatment	6	Suction unit	3	1		1		3	Including Internal medicine and Out-patient surgery
24	ERC-II	First aid & treatment	7	Resuscitator, demand valve type	3	1	1			0	
25	ERC-II	First aid & treatment	8	Diagnostic light	3	1	1			0	
26	ERC-II	First aid & treatment	9	Diagnostic scope set	4	2	2			0	
27	ERC-II	First aid & treatment	10	Medical refrigerator	1	0				0	
28	ERC-II	First aid & treatment	11	Sphygmomanometer, table top type	4	2	2			0	
29	ERC-II	First aid & treatment	12	I.V. Hanger stand	5	2	2			0	
30	ERC-II	First aid & treatment	13	Resuscitation bag set	4	1	1			0	
31	ERC-II	First aid & treatment	14	Instrument cabinet	4	1	1			0	
32	ERC-II	First aid & treatment	15	Instrument cart	1	1	1			0	
33	ERC-II	First aid & treatment	16	Basin with stand	1	1	1			0	
34	ERC-II	First aid & treatment	17	Stretcher trolley for Emergency	4	2	2			0	
35	ERC-II	First aid & treatment	18	Wheel chair	3	2	2			0	
36	ERC-II	First aid & treatment	19	Stretcher trolley for Emergency	2	0				0	Duplicated with No.17
37	ERC-II	First aid & treatment	20	Basic instrument set	4	2	2			0	
38	ERC-II	First aid & treatment	21	Diagnostic instrument set	5	0				0	Duplicated with No.20
39	ERC-II	First aid & treatment	22	UV hand washing unit	2	0				0	
40	ERC-II	Observation	1	Hospital bed	5	6	6			0	
41	ERC-II	Observation	2	Ultrasound apparatus, portable type	1	0				0	
42	ERC-II	Observation	3	Ventilator, portable	2	0				0	
43	ERC-II	Observation	4	Bedside monitor (ECG, NIBP, SaO2, Temp.)	2	0				0	
44	ERC-II	Observation	5	Defibrillator	1	1		1		1	Common use in First aid & treatment room
45	ERC-II	Observation	6	ECG, Portable type	1	0				0	
46	ERC-II	Observation	7	Pulse Oximeter	3	0				0	
47	ERC-II	Observation	8	Suction unit	3	0				0	
48	ERC-II	Observation	9	Infusion pump	3	0				0	
49	ERC-II	Observation	10	Spring pump	3	0				0	
50	ERC-II	Observation	11	Diagnostic light	3	1	1			0	
51	ERC-II	Observation	12	Diagnostic scope set	2	0				0	
52	ERC-II	Observation	13	Film illuminator, mobile type, 2 film	2	0				0	
53	ERC-II	Observation	14	Medical refrigerator	1	0				0	
54	ERC-II	Observation	15	Sphygmomanometer, wall mounted type	2	0				0	
55	ERC-II	Observation	16	I.V. Hanger stand	5	0				0	
56	ERC-II	Observation	17	Resuscitation bag set	2	0				0	
57	ERC-II	Observation	18	Instrument cabinet	2	0				0	
58	ERC-II	Observation	19	Instrument cart	2	0				0	
59	ERC-II	Observation	20	Basin with stand	1	0				0	
60	ERC-II	Observation	21	Sterilizing container set	2	0				0	
61	ERC-II	Observation	22	Basic instrument set	1	0				0	
62	ERC-II	Observation	23	Stretcher trolley	2	1				0	
63	ERC-II	Operating theater	1	Operation table, manual type	1	1		1		1	Apply by equipment for general purpose and manual type
64	ERC-II	Operating theater	2	Operation table for Neurosurgery, manual type	1	1		1		1	Apply by equipment for general purpose and manual type
65	ERC-II	Operating theater	3	Operation table for Orthopedics, manual type	1	1		1		1	Addition of Accessory for orthopedics for general purpose
66	ERC-II	Operating theater	4	C-arm X-ray unit, mobile type	1	0				0	
67	ERC-II	Operating theater	5	Anesthesia apparatus with ventilator	3	3		3		3	
68	ERC-II	Operating theater	6	Bedside monitor (ECG, NIBP, SaO2, Temp.)	3	3		3		3	
69	ERC-II	Operating theater	7	Defibrillator	1	1		1		1	
70	ERC-II	Operating theater	8	Pulse Oximeter	1	1	1			0	
71	ERC-II	Operating theater	9	Electrosurgical unit	3	3		3		3	
72	ERC-II	Operating theater	10	Suction unit	3	3		3		3	
73	ERC-II	Operating theater	11	Operation microscope	1	0				0	
74	ERC-II	Operating theater	12	Operation light, ceiling type	3	3		3		3	
75	ERC-II	Operating theater	13	Operation light, mobile type	3	0				0	
76	ERC-II	Operating theater	14	Film illuminator, wall type, 4 film	3	3	3			0	
77	ERC-II	Operating theater	15	Film illuminator, mobile type, 4 film x 2	2	0				0	
78	ERC-II	Operating theater	16	Laryngoscope, macintosh type	9	2	2			0	
79	ERC-II	Operating theater	17	Resuscitation bag set	3	1	1			0	
80	ERC-II	Operating theater	18	Laparoscope set with light source	1	0				0	
81	ERC-II	Operating theater	19	Proctoscope set with light source	1	0				0	

Sr. No.	Department	Room	Item No.	Description	Requeste Qty	Existing Qty	Working Situation of Existing Equipment			Planned Qty	Remarks
							Working	Repairing	No-working		
100	ERC-II	Operating theater	38	Kick bucket	3	3	3			0	
101	ERC-II	Operating theater	39	Chair for operator	4	0	0			0	
102	ERC-II	Operating theater	40	Chair for anesthetist	3	0	0			0	
103	ERC-II	Operating theater	41	Stretcher trolley	3	2	2			0	
104	ERC-II	Operating theater	42	Stretcher trolley, folding type	1	0	0			0	
105	ERC-II	Operating theater	43	Surgical scrub station	1	1	1			0	
Add	ERC-II	Small operating room	1	Instrument set for treatment (small surgery)	1	1			1	3	Add Qty as basic component.
Add	ERC-II	Small operating room	2	Suction unit	1	1		1		1	
Add	ERC-II	Small operating room	3	Operation Table	2	2		2		2	
Add	ERC-II	Small operating room	4	Operation Light, portable	1	1			1	1	
Add	ERC-II	Small operating room	5	Autoclave, table top type	1	1			1	1	
106	ERC-II	High Care Unit	1	Central monitor	1	0				0	
107	ERC-II	High Care Unit	2	Bedside monitor (ECG, NIBP, SpO2, Temp.)	5	0				3	Allocated under the Plan of reform by Myanmar side.
108	ERC-II	High Care Unit	3	ICU bed	5	0				5	Allocated under the Plan of reform by Myanmar side.
109	ERC-II	High Care Unit	4	Ventilator for ICU	3	0				3	Floor stand type (2), Portable (1)
110	ERC-II	High Care Unit	5	Defibrillator	1	1		1		1	
111	ERC-II	High Care Unit	6	Suction unit	3	1	1			1	ICU(1)
112	ERC-II	High Care Unit	7	Oxygen inhalator set, wall mounted type	5	0				0	
113	ERC-II	High Care Unit	8	Oxygen inhalator set, cylinder mounted type	2	0				0	
114	ERC-II	High Care Unit	9	Tracheotomy instrument set	3	0				0	
115	ERC-II	High Care Unit	10	Infusion pump	5	0				0	
116	ERC-II	High Care Unit	11	Infusion pump	5	0				0	
117	ERC-II	High Care Unit	12	Diagnostic light	5	0				0	
118	ERC-II	High Care Unit	13	Laryngoscope, macintosh type	3	0				0	
119	ERC-II	High Care Unit	14	Resuscitation bag set	3	0				0	
120	ERC-II	High Care Unit	15	LV Hanger stand	5	0				0	
121	ERC-II	High Care Unit	16	Instrument cabinet	3	0				0	
122	ERC-II	High Care Unit	17	Instrument cart	2	0				0	
123	ERC-II	High Care Unit	18	Sterilizing container set	1	0				0	
124	ERC-II	High Care Unit	19	Stretcher trolley for ICU	2	0				0	
125	ERC-II	High Care Unit	20	Minor basic instrument set	1	1	1			0	
126	ERC-II	Operation theater store	1	Appendectomy instrument set	2	0				0	
127	ERC-II	Operation theater store	2	Laparotomy instrument set	2	1	1			0	
128	ERC-II	Operation theater store	3	Thorax surgical instrument set	2	1	1			0	
129	ERC-II	Operation theater store	4	Air craniotomy drill set	1	0				0	
130	ERC-II	Operation theater store	5	Air microsurgery set	2	0				0	
131	ERC-II	Operation theater store	6	Reciprocating bone saw	2	0				0	
132	ERC-II	Operation theater store	7	Anterior cervical retractor set	2	1	1			0	
133	ERC-II	Operation theater store	8	Cervical TDR set	2	1	1			0	
134	ERC-II	Operation theater store	9	Micro neurosurgery set	2	1	1			0	
135	ERC-II	Operation theater store	10	Posterior lumbers retractor set	2	0				0	
136	ERC-II	Operation theater store	11	Retractor blade set	2	0				0	
137	ERC-II	Operation theater store	12	Tumor forceps set	2	0				0	
138	ERC-II	Operation theater store	13	Verticular needle and tube set	2	0				0	
139	ERC-II	Operation theater store	14	Wire traction instrument set	2	0				0	
140	ERC-II	Operation theater store	15	Bone hand drill	2	0				0	
141	ERC-II	Operation theater store	16	Bone saw, electric type	1	0				0	
142	ERC-II	Operation theater store	17	Skin grafting knife	2	0				0	
143	ERC-II	Operation theater store	18	Dermatome, electric type	1	0				0	
144	ERC-II	Operation theater store	19	Dermatome, manual type	1	0				0	
145	ERC-II	Operation theater store	20	Skin making pen	10	0				0	
146	ERC-II	Operation theater store	21	Plastic and reconstructive surgery set	2	0				0	
147	ERC-II	Operation theater store	22	Dermatoplastic surgery set	2	0				0	
148	ERC-II	Operation theater store	23	Titanium microplate system	2	0				0	
149	ERC-II	Operation theater store	24	Endotracheal set	3	0				0	
150	ERC-II	Operation theater store	25	Emergency tracheotomy instrument set	5	0				0	
151	ERC-II	Operation theater store	26	Suture instrument set	6	0				0	
152	ERC-II	Operation theater store	27	Sterilizing container set	5	0				0	
153	ERC-II	Operation theater store	28	Instrument cabinet	3	0				0	
154	ERC-II	Operation theater store	29	Emergency surgery set	3	2			2	9	Add Qty as Basic Surgery Instrument set.
155	Common (ERC & Outpatient)	X-ray	1	CT scanner, whole body with injector	1	1		1		1	
156	Common (ERC & Outpatient)	X-ray	2	Laser imager	1	0				1	Allocated as accessory of CT.
157	Common (ERC & Outpatient)	X-ray	3	X-ray unit, diagnostic	1	7		4	3	2	Change from Fluoroscopic system to General X-ray. Total 2 apparatus.
158	Common (ERC & Outpatient)	X-ray	4	X-ray unit, Multipurpose fluoroscopic system	1	1			1	0	
159	Common (ERC & Outpatient)	X-ray	5	Lead glass	2	0				1	Allocated as accessory of X-ray unit.
160	Common (ERC & Outpatient)	X-ray	6	Dosimeter	3	0				0	
161	Common (ERC & Outpatient)	X-ray	7	Protective lead curtain	3	0				1	Allocated as accessory of X-ray unit.
162	Common (ERC & Outpatient)	X-ray	8	Lead panel	1	0				1	Allocated as accessory of X-ray unit.
163	Common (ERC & Outpatient)	X-ray	9	Protective apron set	3	0				1	Allocated as accessory of X-ray unit.
164	Common (ERC & Outpatient)	X-ray	10	Protective glove set	3	0				1	Allocated as accessory of X-ray unit.
165	Common (ERC & Outpatient)	X-ray	11	Protective glasses set	3	0				1	
166	Common (ERC & Outpatient)	X-ray	12	Film illuminator, mobile type, 2 filmx 2	3	0				0	
167	Common (ERC & Outpatient)	X-ray	13	Ultrasound apparatus, general purpose	1	1		1		1	
168	Common (ERC & Outpatient)	X-ray	14	Examination table	1	0				0	
169	Common (ERC & Outpatient)	X-ray	15	Panorama X-ray unit for dental	1	0				0	
170	Common (ERC & Outpatient)	Dark room	1	Automatic film processor	2	0				0	
171	Common (ERC & Outpatient)	Dark room	2	Cassett pass box	3	1		1		1	Included in Manual film developing set.
172	Common (ERC & Outpatient)	Dark room	3	Film loading desk	2	1		1		1	Included in Manual film developing set.
173	Common (ERC & Outpatient)	Dark room	4	Manual film developing set	2	1		1		1	Included in Manual film developing set.
174	Common (ERC & Outpatient)	Dark room	5	Name printer	2	0		0		0	
175	Common (ERC & Outpatient)	Dark room	6	Film dryer	2	1		1		1	Included in Manual film developing set.
176	Common (ERC & Outpatient)	Dark room	7	Film casset with intensifying screen set	4	2		2		1	Included in Manual film developing set.
177	Common (ERC & Outpatient)	Dark room	8	Dark room accessory set	2	1		1		1	Included in Manual film developing set.
178	Common (ERC & Outpatient)	Dark room	9	Automatic film processor for dental	1	0				0	

Sr. No.	Department	Room	Item No.	Description	Requested Qty	Existing Qty	Working Situation of Existing Equipment			Planned Qty	Remarks
							Working	Repairing	No-working		
217	Outpatient	Medicine	14	Instrument cabinet	9	0				0	
218	Outpatient	Medicine	15	Instrument cart	9	0				0	
219	Outpatient	Medicine	16	Basin with stand	9	0				0	
220	Outpatient	Medicine	17	Basic instrument set	9	0				0	
221	Outpatient	Surgery	1	Examination table	6	2	2			0	
222	Outpatient	Surgery	2	Diagnostic light	6	1	1			0	
223	Outpatient	Surgery	3	Bovling sterilizer	3	0				0	
224	Outpatient	Surgery	4	Film illuminator, mobile type, 2 film	6	0				0	
225	Outpatient	Surgery	5	Sphygmomanometer, wall mounted type	6	0				0	
226	Outpatient	Surgery	6	Instrument cabinet	6	0				0	
227	Outpatient	Surgery	7	Instrument cart	6	0				0	
228	Outpatient	Surgery	8	Basin with stand	6	0				0	
229	Outpatient	Surgery	9	Instrument set for treatment (small surgery)	6	0				0	
230	Outpatient	Surgery	10	Basic instrument set	6	0				0	
231	Outpatient	Surgery	11	Plaster table	1	0				0	
232	Outpatient	Surgery	12	Plaster cutter, electric type	1	0				0	
233	Outpatient	Surgery	13	Plaster storage cabinet	1	0				0	
234	Outpatient	Surgery	14	Plaster instrument set	2	0				0	
235	Outpatient	Surgery	15	Bedside monitor (ECG, NIBP, SaO2, Temp.)	2	0				0	
236	Outpatient	Dental	1	Dental chair unit with compressor and aspirator	5	4	4			0	
237	Outpatient	Dental	2	Diamond point set	10	0				0	
238	Outpatient	Dental	3	X-ray unit for dental	1	0				0	
239	Outpatient	Dental	4	Autoclave, table top type	3	0				0	
240	Outpatient	Dental	5	Light curing unit	5	0				0	
241	Outpatient	Dental	6	Ultrasonic dental scaler	5	0				0	
242	Outpatient	Dental	7	Oral surgery instrument set	3	0				0	
243	Outpatient	Dental	8	Electric pulp tester	5	0				0	
244	Outpatient	Dental	9	Instrument cart	5	0				0	
245	Outpatient	Dental	10	Chair for doctor	5	0				0	
246	Outpatient	Dental	11	Instrument cabinet	5	0				0	
247	Outpatient	Dental laboratory	1	Laboratory Micromotor unit	2	0				0	
248	Outpatient	Dental laboratory	2	Laboratory lathe	2	0				0	
249	Outpatient	Dental laboratory	3	Mold trimmer	2	0				0	
250	Outpatient	Dental laboratory	4	Resin curing unit	2	0				0	
251	Outpatient	Dental laboratory	5	Electric welder and solder	2	0				0	
252	Outpatient	Dental laboratory	6	Articulator	3	0				0	
253	Outpatient	Dental laboratory	7	Material mixer with impression tray	2	0				0	
254	Outpatient	Dental laboratory	8	Hand instrument set	2	0				0	
255	Outpatient	Dental laboratory	9	Laboratory cabinet	1	0				0	
256	Common (ERC & Outpatient)	Other	1	Ambulance with accessories	5	2		2		0	
257	Common (ERC & Outpatient)	Other	2	Stretcher trolley for Emergency	15	2	2			0	
258	Common (ERC & Outpatient)	Other	3	Wheel chair	10	2	2			0	
259	Common (ERC & Outpatient)	Other	4	Mortuary locker, 4 beds	2	0				0	
260	Common (ERC & Outpatient)	Other	5	Computer with printer	10	0				0	
261	Common (ERC & Outpatient)	Other	6	Copy machine	3	0				0	
Add	Common (ERC & Outpatient)	Other	7	Copy machine	1	1		1		1	

(3) Equipment Plan

The equipment that it is considered appropriate to furnish in this project is the following table 2-1:

**Table2-2 List of the planning equipment**

No.	Descriptions	Specification or Composition	Q'ty	State of Existing Equipment	Purpose of Using Equipment; Adequacy of Equipment Level	Procurement		Remarks
						in Myanmar	from Japan	
1	Bedside Monitor	Measuring parameters: ECG, Respiration, Temperature, Pulse, SPO2 Display: 6 inch or more With Recording Paper	6	There are 20 units of this kind in the ICU, but they are no longer serviceable, some broken down beyond repair and others malfunctioning. This plan calls for distributing three units in the operating rooms and three others in the rooms for critically ill patients.	Used for the purpose of monitoring the somatological information of ICU patients. Basic electrocardiogram, breathing, cuticle oxygen density, and blood pressure are displayed by wire.		○	
2a-1	Operating Instrument Set (for general surgery)	Surgical operation set, Forceps and other 87 items	9	Equipment made in China is used at present. There are only three sets, and frequent sterilization is necessary. There are many cases of edges being chipped and rust gathering	The forceps are suitable for various operations.		○	
2a-2	Operating Instrument Set (for special surgery)	Neurosurgical drill and other 84 items, a set of orthopedic instruments, drill and other 21 items	3	There are few tools for orthopedics and neurosurgery, making it impossible to cope with the increasing number of patients. There is only one set at present, with the edges chipped often.	These forceps are applied to special surgical operations.		○	
2b	Operating Instrument Set (for minor surgery)	A set of instruments for minor surgery, scissors and other 70 items	3	There is only one set of tools that can be used continuously, so an additional supply is necessary.	Used for initial treatment with these simple operating tools in order to prevent the progress of diseases.		○	
3	Suction Unit A	Capacity:20 l/min. or more Motor output:65 W or more Suction bottles:3 1×1 bottle or more Caster: provided	4	Now there are only two units for four treatment rooms in the first-aid and outpatient divisions. Their output has declined because of aging. The plan calls for renewing the equipment and increasing the number of units in proportion to the number of treatment rooms.	Used to absorb filth. With frames attached, it can be moved within a room, making it possible to carry out operations safely and smoothly.		○	
4	Suction Unit B	Motor output:200 W or more Capacity:40 l/min. or more Suction pressure:0 to 700 mmHg or more Suction bottles:3 1×2 bottle	5	Three units, now used in the operating room, have so largely exceeded the period of durability that their output has fallen. This plan calls for renewing the three units in the operating room and adding two units for critically ill patients.	Usable for long-time operations with its large capacity in order to absorb filth that gathers during operations.		○	

No.	Descriptions	Specification or Composition	Q'ty	State of Existing Equipment	Purpose of Using Equipment; Adequacy of Equipment Level	Procurement		Remarks
						in Myanmar	from Japan	
5	Sterile hand-washing equipment	Bacterial filter pore size: 1 $\mu$ m Material of water filter: Polyester Single-tap type, with a sink.	2	Presently there are only two wash-stands using city water as is, with no filter attached. This is sanitarily a problem, and therefore the plan specifies that the simplest possible filter be attached.	The hands of operating surgeons and others are sterilized by washing, in order to prevent patients from being infected during operations.	○		It is very hard to procure consumable items since agencies for there are no local Japanese product makers. Owing to that the third country products become widely available in Myanmar, there are few problems about maintenance systems.
6	Operating Table	Manual-hydraulic. Range of table-top height: at least 77 – 100 cm. Tilt of head section: at least 25° up and down.	5	The three tables in the operating room perform such functions as going up and down and other adjustments, but they may cause some trouble or other depending upon operative regions. The model is too old for necessary parts to be procured for exchange or to be repaired. This plan calls for providing three more tables in the operating room and two tables in the small operating room.	Capable of easily changing the position of patients during operations, making it possible to carry out complicated operations safely and reliably. The hydraulic/manual system makes maintenance work easy.		○	
7	Defibrillator	Output energy: 2 ~ 360 J or more Charging time: $\leq$ 5 sec. under 360 J (with AC operation) With ECG monitor and cart	2	The existing two units are too old for repair, and their model is also too old for necessary parts to be procured for exchange. So the two units will be renewed.	Used urgently for the resuscitation of patients suffering from ventricular fibrillation.		○	
8	Ventilator	Tidal volume: 50–1200 ml or more Mode: SIMV/CMV/CPAP/PEEP With Humidifier and Air compressor	2	The existing 25 units now in use in the ICU are seriously damaged because of aging, and the model is also too old for necessary parts to be procured for exchange. In the facility covered by this plan, two units will be placed in the critically ill patient's room that is used before they are carried into the ICU. (10) Used to maintain the life of any patient that is incapable of spontaneous respiration.	Used to maintain the life of any patient that is incapable of spontaneous respiration.		○	
9	Ventilator (Portable)	Portable type Tidal volume: Max. 1400 ml With Rechargeable battery	1	The existing one unit, though operating to some extent, fails to work satisfactorily at times, and is therefore dangerous for patients. The model is also too old for necessary parts to be procured for exchange.	Being portable, it can be used in carrying patients needing emergency treatment.	○		The third country products, which are actually sold in local agencies and are under maintenance services, should be considered since the use of all Japanese products can not ensure competitiveness and fairness.

No.	Descriptions	Specification or Composition	Q'ty	State of Existing Equipment	Purpose of Using Equipment; Adequacy of Equipment Level	Procurement		Remarks
						in Myanmar	from Japan	
10	ECG	Number of channels: 3 Input impedance method: 10 MΩ or more Rechargeable battery: 30 min. or more	1	This is too old for repair, and the cables are also seriously deteriorated. There are presently two units, but the situation can be coped with by renewing one of them by concentrating all functions available through on-site repair work.	Diagnostic aids for arrhythmia, septic heart disease, cardiomegaly, electrolyte malfunctions, etc., can be performed using electrical data.		○	
11	Ultrasonic Scanner	Display modes: B, M, B/M Probes: Linear, Convex Monitor: 12-inch or more	1	The existing one unit made in the Republic of Korea is in operation, but the B/M mode does not function due to aging. The probe is also old, and the detecting function is partly impaired.	This equipment can produce structural images in the human body by irradiating it with supersonic waves and analyzing the reflected waves within the equipment. The forms of internal organs and diseases as well as the characteristics of tissue structure can be judged by detecting and observing the reflected waves.		○	
12	Electro Surgical Unit	Type: Monopolar/bipolar Output circuit: Floating system Function: Cutting, coagulation Output power (coagulation): 120 W or more With cart	3	The outputs of the existing three units are insufficient because of aging, making the dissecting and clotting functions incomplete.	Enables electric dissecting and clotting processes during operations, making safe and reliable operations possible.		○	
13	Anesthetic Apparatus (with Ventilator)	Respiratory mode: CMV Vaporizer: Halothane, Isoflurane Capacity of flow meter: 50 l/min. or more	3	The existing three units are too old for use, involving such problems as anesthetic gas leakage, questionable flow accuracy, and malfunctions in artificial respiration.	Used to give general anesthesia to patients during operations in order to give them safe treatment by eliminating their burden.	○		The third country products have a dominant market position in Myanmar. Also, the products that can be locally procured should be considered in order to ensure business competitiveness and fairness.
14	Operating Light (Mobile)	Diameter: 50 cm or more Light intensity: 140 000 lux or more Height: 150 cm or more	1	The existing lamp, not used for medical care, is a mere floor lamp involving such problems as having many shadowy parts because of insufficient brightness and a small diameter.	Furnishes irradiation, illuminance and so forth for operations, equipped with wheels for movement purposes to serve for minor operations. It is not equipped with any emergency battery.	○		The both of Japanese and third country products become widely available there, but the third country products should be considered because the use of all Japanese products can not ensure competitiveness and fairness.
15	Operating Light (Ceiling Type)	Type: Ceiling type Light intensity: 75 000 lux or more Light source: halogen light	3	The existing three units are so much aged that the lamps do not light up even when exchanged. They may possibly fall because rust is gathering at the places they are hung from the ceiling	Furnish irradiation, illuminance, appropriate color and temperature, and athermancy so that operations can be performed safely and reliably.		○	

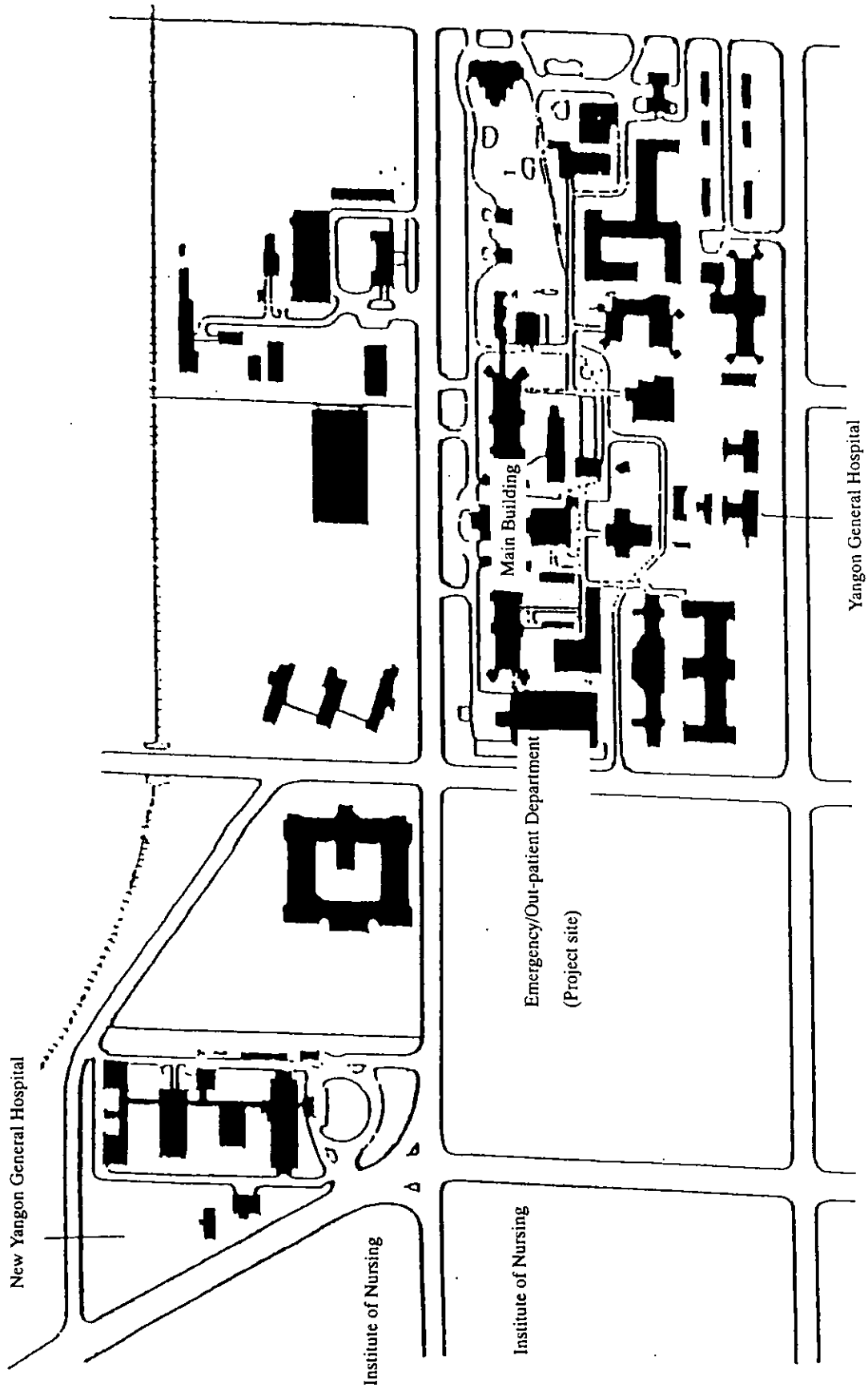
No.	Descriptions	Specification or Composition	Q'ty	State of Existing Equipment	Purpose of Using Equipment; Adequacy of Equipment Level	Procurement		Remarks
						in Myanmar	from Japan	
16	Sterilizer (Table top)	Table top Chamber capacity: 10 l. or more Sterilizing temp.: at least 121 – 123°C Timer: provided	1	Presently one boiling sterilizer is used, but the heater output does not rise, and too many hours are required for sterilization.	Being small in size, it can be installed at any place so as to be operated with ease. It can also sterilize operating forceps quickly, and is therefore serviceable even in an emergency.	○		There are no Japanese product makers that own local agency and have the same specifications as in Japan. The third country products can be locally procured at an advantageous price, while their maintenance is properly conducted.
17	Biochemical Analyzer	Compatible with openly available reagents Measurement wavelengths: at least 340 – 600 nm Throughput: at least 180 tests/hour	1	The existing one unit is presently in operation is incapable of measuring some data because of aging, making it difficult to control its accuracy and impossible to procure expendable supplies and some parts for exchange.	Used for quickly measuring values for emergency examinations, including the values of enzymes in blood, cholesterol, uric acid, blood sugar, etc., serving as a material for judgment in the treatment of patients requiring operations or urgent treatment.		○	
18	CT Scanner	Scan time: 1.1 ~ 4 sec. or more X-ray tube heat capacity: 2MHU or more X-ray tube voltage: Max. 120 kV	1	The existing one unit is no longer serviceable. The old rotate/rotate method mentioned in the specifications requires much time for inspection, and therefore the equipment is not suitable for emergency treatment. The place where the equipment is installed is separated from the division concerned, causing patients to bear a heavy burden when transferred.	Serving for operations on patients by furnishing tomograms, with the body cut into round slices, making it possible to recognize the state of bloodstream and to quickly and correctly judge the regions of emergency operations for intracerebral hemorrhage, etc.		○	
19	X-ray unit (w/accessories)	Max. power: 32kw, 500mA Inverter frequency: 20 kHz or more With Bucky stand and table	2	The existing two units are now beyond repair because fifteen to more than twenty years have passed since they were installed in the division concerned. The neighboring radiation division is coping with this difficulty, but the equipment here has also become so old that it is partly out of order or the output is extremely low.	Used to X-ray the chest and fractured hands and feet, to make quick and correct operations possible by correctly grasping the conditions of fracture.		○	
20	X-ray Film Processor Unit	Film Processor manual type Fixer tank capacity: 18 l × 2 tanks Processing capacity: 5 pieces/1 time Film dryer, timer	1	The existing one tank is rusty and internally corroded, causing a leakage of liquid developer or of fixing solution in addition to film stains due to the scattering of rust over the liquid. This plan calls for the procurement of one tank and related equipment as a set.	Used for the development of radiation films. The manual type is suitable for the development of a small number of films urgently needed. Maintenance and repair of the equipment are easy.		○	

No.	Descriptions	Specification or Composition	Q'ty	State of Existing Equipment	Purpose of Using Equipment; Adequacy of Equipment Level	Procurement		Remarks
						in Myanmar	from Japan	
21	ICU Bed	Lifting function of backs and legs With I.V. pole, Casters and side rails	5	The 20 beds presently used in the ICU have exceeded the period of durability. Since the number of the beds is not enough, the plan calls for the establishment of five beds for critically ill patients in the emergency/outpatient division as a step before the patients are carried into the ICU.	Can be adjusted so as to facilitate the treatment of serious cases. For the lifting of backs and legs, the best preparations can be made according to the conditions of patients.		○	
22	Switch Board System	Switch gear, Transformer, Generator	1	Some transformers have spent more than 35 years, and some generators and cables more than 15 years, involving such problems as aging and insufficient power receiving capacity. There are three kinds of such facilities in the whole hospital, and the one that supplies power to the division concerned shall be renewed.	When the commonly used power supply is cut off, these facilities are urgently used to prevent the suspension of operations or of the use of artificial respirators, and thus ensure the safety of patients.	○		Most of the relevant products widely available in Myanmar are the third country ones and their maintenance is well performed. Also, the products can be procured there at more favorable prices.

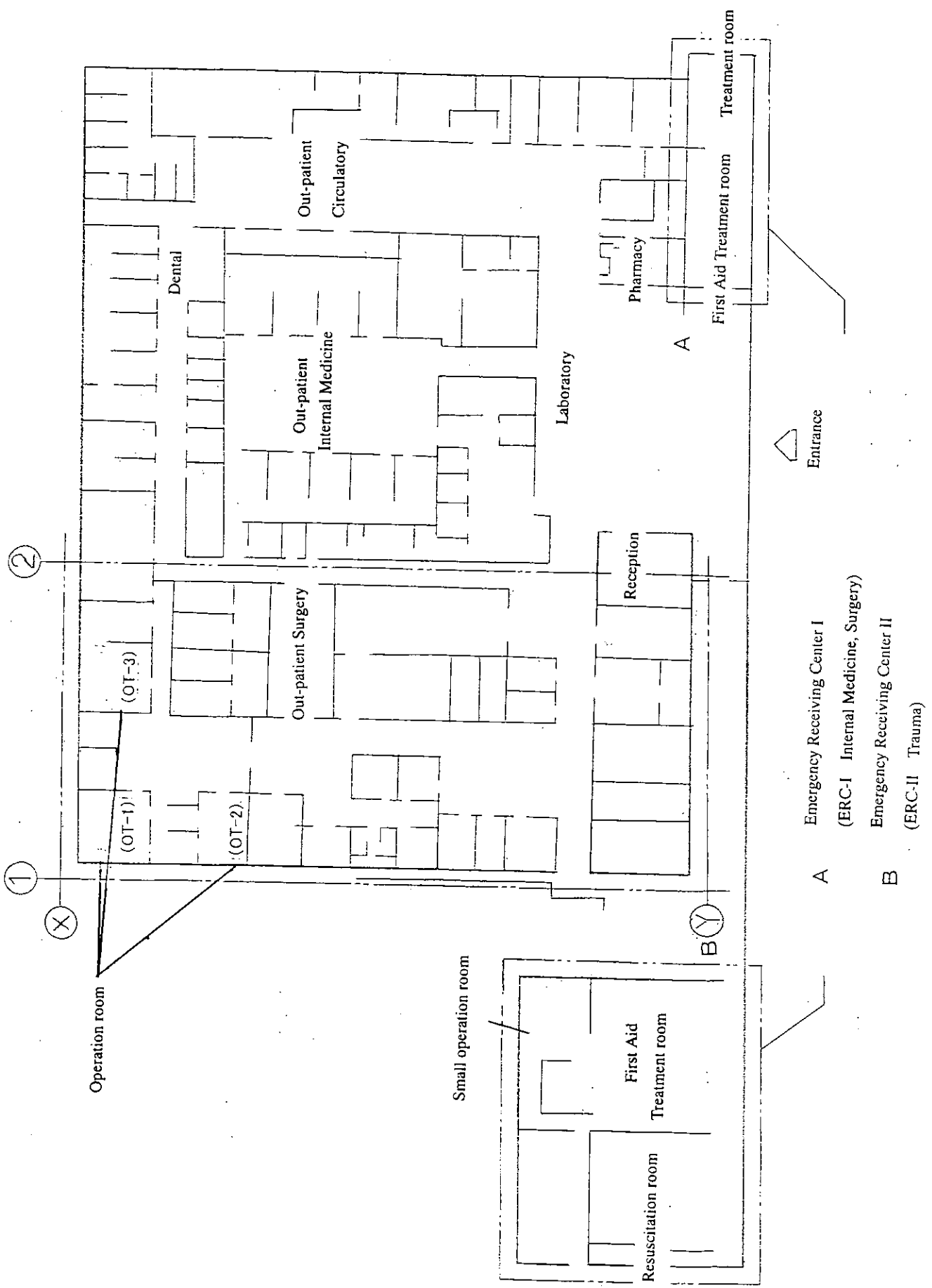


2-2-3 Basic Design

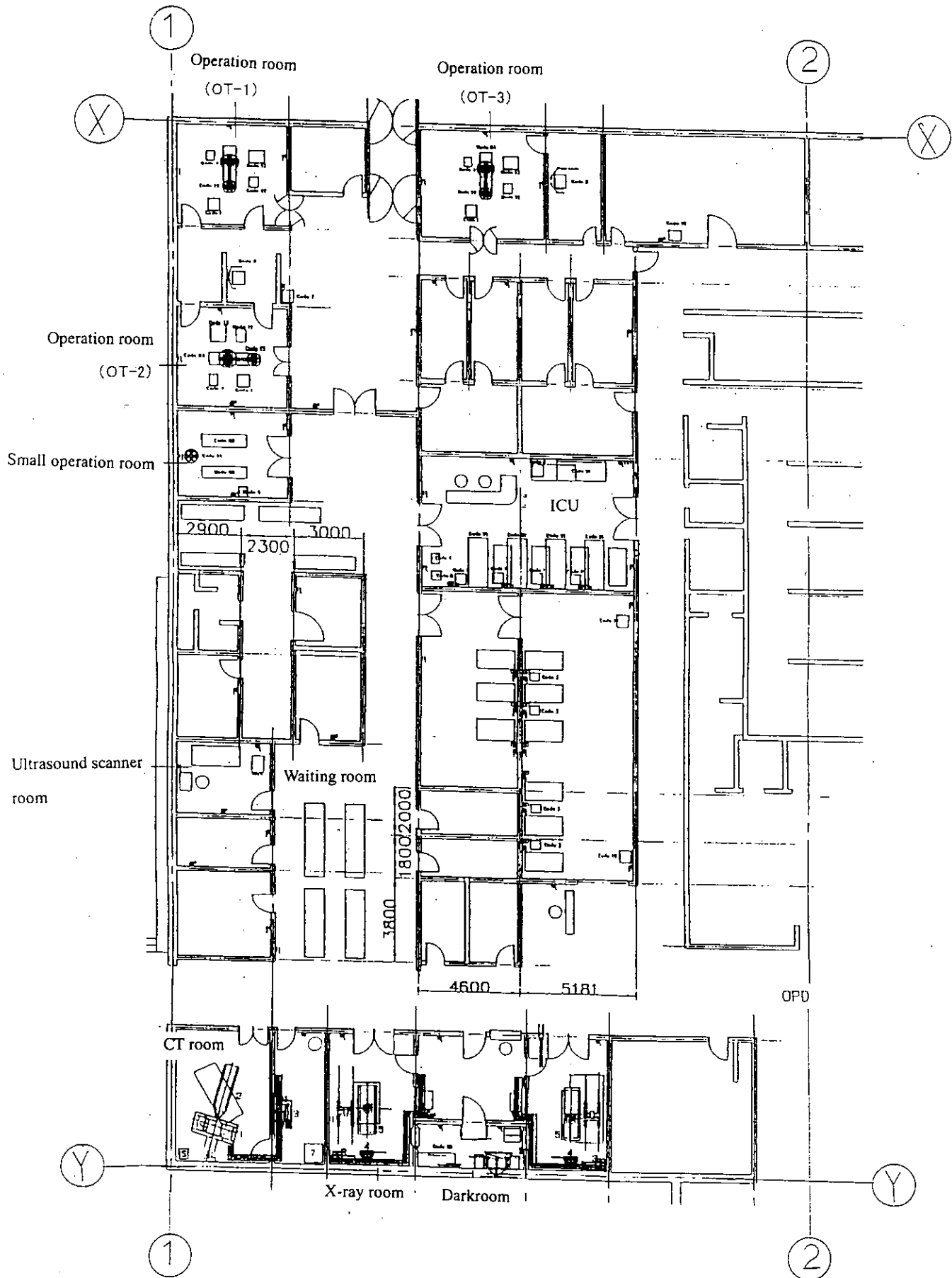
(1) Map of Rangoon General Hospital



(2) Plan view of ER and outpatient



(3) Layout of equipments



A breakdown of the allocation plan for equipment is indicated in Table 2-3.

**Table 2-3 Table of Equipment Allocation Plan**

Code No.	Equipment	Allocation Place	Q'ty
1	Patient Monitor	High Care Unit	3
1	Patient Monitor	Operating theater	3
2a	Instrument set (for surgery)	Operating theater	9
2b	Instrument set (for small surgery)	Small Operation Room	3
3	Suction unit A	First aid & treatment	4
3	Suction unit B	High Care Unit	1
4	Suction unit B	Operating theater	3
4	Suction unit B	Small Operation Room	1
5	Surgical scrub station	Operating theater	2
6	Operation Table	Operating theater	3
6	Operation Table	Small Operation Room	2
7	Defbrillator	First aid & treatment	1
7	Defbrillator	Operating theater	1
8	Ventilator	High Care Unit	2
9	Ventilator (Portable)	High Care Unit	1
10	ECG	First aid & treatment	1
11	Ultrasound apparatus	Ultrasound examination room	1
12	Electrosurgical unit	Operating theater	3
13	Anesthesia apparatus with ventilator	Operating theater	3
14	Operation light, ceiling type	Small Operation Room	1
15	Operation light, mobile type	Operating theater	3
16	Autoclave (Table top type)	Small Operation Room	1
17	Drychemical analyzer, table top type	Laboratory of Emergency Out patient	1
18	CT Scanner	X-ray	1
19	X-ray unit, diagnostic	X-ray	2
20	Manual film developing set	Darkroom	1
21	ICU Bed	High Care Unit	5
22	Electrical System	General Service	1

## 2-2-4 Implementation Plan

### 2-2-4-1 Implementation Policy

#### (1) Implementation Organization

##### 1) Project Implementing Organization

The Department of Health, the Ministry of Health of the Union of Myanmar is the organization bearing responsibility for management and implementation of the project. While coordinating with the Yangon General Hospital regarding the technical supervision and follow-up required by the project, it will accomplish its work under the supervisory control of the Medical Services Department, Financial Section and International Cooperation Section of the Ministry of Health. Furthermore, it will bear the expenses involved in implementation of the Japanese grant aid on the basis of receipt beforehand of the technical judgment of the Yangon General Hospital. After implementation of the project the consumables, spare parts, etc. that are needed are to be procured from the CMSD.

##### 2) Consultant

Immediately after the exchange of notes (E/N) between the Japanese Government and the Government of Myanmar the Japanese consultant is to conclude a consulting contract with the Health Department, the representative of the Myanmar side, in accordance with Japan's grant aid formalities. It is to do the following work on the basis of that contract, which will take effect once it is approved by the Japanese Government:

- ① Confirmation of the finalized content of the project: Final confirmation of the equipment specifications and other technical documents.
- ② Tender stage: Selection of contractor for procurement of the equipment and cooperation in the work relating to the procurement contract.
- ③ Procurement stage: Management of procurement of the equipment and accomplishment of the work involved in inspection before shipment.
- ④ Installation stage: Overseeing of installation and operation and maintenance guidance.

The consultant is to undertake the working design and equipment procurement control work on the basis of a 3-man technical team consisting of a work chief, an equipment planning man and a facilities planning man.

- ◇Project Manager: He is to manage the discussions between the Japanese Government and the Government of Myanmar as the person responsible for all of the work from detailed design to completion of installation.
- ◇Equipment planner: He is to accomplish final confirmation of the equipment specifications with the Health Department, the hospital and the different equipment manufacturers. After that, he is to prepare the necessary documents for submittal to the Japanese Government and the Government of Myanmar, including the tender drawings and specifications as well as being in charge of inspection at the time of acceptance.

◇Facility planner: He is to check the content of the specifications relating to the electrical facilities included in the project and prepare the necessary documents for the installation supervision work as well as undertaking the inspection at the time of acceptance.

### 3) Equipment Procurement Contractor

The equipment procurement contractor is to be selected by tender, the successful bidder concluding a contract with the Health Department. That contract, too, will take effect upon approval by the Japanese Government. The contractor is to procure and bring in the necessary equipment on the basis of that contract and provide technical guidance for its installation, operation and maintenance. He is also to prepare manuals and other technical documents necessary for maintenance after procurement and a list of the manufacturers' agencies as well as accomplishing adequate coordination with the implementing organization concerning the timing of installation and other matters and ensuring that the project is smoothly implemented.

### 4) Japan International Cooperation Agency (JICA)

For smooth implementation of the project JICA will see to confirmation and approval of different documents by the Japanese Government.

## (2) Implementation Policy

- 1) After conclusion of the exchange of notes (E/N), in the various stages-the tender, approval of the tender documents, selection of the contractor, conclusion of the contract with the contractor, confirmation of the manufacturing schedule, inspection before shipment and payment for the supplies, work and services in the project - the consultant is to adequately conduct discussions with Myanmar government entities, Japanese government entities, the equipment procurement contractor and other necessary organizations for ironing out details and accomplish the necessary formalities for the sake of ensuring smooth implementation of the project.
- 2) In view of the fact that the facility covered by the project is a hospital, it is not permissible to suspend its daily business in bringing in equipment and materials and carrying out installation work. Therefore in order not to impede the progress of project implementation the consultant is to conduct close prior coordination with the hospital officials in the working design stage regarding work schedules and other necessary matters. Furthermore, he is to pay strict attention to control of noise and sanitary conditions at the time of the installation work and particularly to safety control in bringing in the medical equipment.

- 3) For equipment procured from Japan the consultant is to accomplish adequate quality control, inspection of manufacturing, inspection before shipment, etc. in Japan beforehand.
- 4) For equipment that requires installation the equipment procurement contractor is to see to it that the manufacturers send technical personnel for that purpose. In the case of equipment for which it is not possible for the manufacturer to send technical personnel to supervise installation, the consultant is to direct the equipment procurement contractor to arrange for the manufacturer's agency to provide such technical personnel instead of the manufacturer.
- 5) At delivery of the equipment the consultant is to accomplish inspection and acceptance thereof at the place of delivery and is to adequately check the results of installation of the equipment in the different departments for confirmation of completion of delivery in the project.
- 6) In order to make sure that all those concerned are thoroughly familiarized with how to operate the procured equipment and other aspects concerning it such as maintenance the people who will be using it are to be brought together in each department to receive training and orientation provided by the equipment procurement contractor. In the case of equipment the use of which can be easily learned on the basis of the operation and maintenance manuals, training will be dispensed with. Furthermore, for strengthening of training there is to be confirmation by methods like periodical checks by people in charge of that in the maintenance section.

#### **2-2-4-2 Implementation Conditions**

##### **(1) On the Japanese Side**

Full attention has to be given to coordination between the repair work being done by the Myanmar side and the installation conditions of the procured equipment. Particular care will have to be taken regarding the detailed content of the installation work at the CT room and the radiation room since installation of X-ray protection walls and lead glass for the X-ray room will be necessary.

##### **(2) On the Myanmar Side**

It is necessary for them to complete the repair and revamping work by shipment of the procured equipment and to arrange prior coordination with the authorities concerned as regards customs duties exemption, customs clearance, etc. for the sake of smooth accomplishment of bringing in and installation the equipment.

### **2-2-4-3 Scope of works**

The following is a summary of division of the work between the Japanese side and the Myanmar side in the present project in terms of the scope of responsibilities of each.

#### **(1) Scope of Responsibilities of the Japanese Side**

- 1) Procurement of the equipment to be furnished in the project.
- 2) Bearing of the cost of marine transportation and inland transportation to the medical facility covered by the project.
- 3) Installation and setting up of the equipment.
- 4) Overall technical guidance regarding trial operation, operation, checking and inspection and upkeep and maintenance of the procured equipment.

#### **(2) Scope of Responsibilities of the Myanmar Side**

- 1) Furnishing of the necessary information and documents for installation and setting up of the equipment.
- 2) Furnishing of a place in the hospital in question for temporary use as an office during the project implementation period.
- 3) Furnishing of the facilities, equipment and places necessary for installation of the procured equipment.
- 4) Completion of primary side incidental work for the necessary utilities (electricity, water supply, sewer service, etc.) for installation of the equipment and removal of the existing equipment from the places where the new equipment is to be installed by the time of installation thereof.
- 5) Furnishing of a place to keep the equipment between delivery and commencement of the installation work.
- 6) Arranging for the necessary conveniences for smooth ship unloading, customs clearance and domestic transportation of the imported equipment.
- 7) Arranging for exemption of payment of customs duties and other taxes and levies by the Japanese personnel residing in Myanmar for the purpose of implementation of the project.
- 8) Providing of conveniences for and paying full attention to securing the safety of Japanese personnel entering and staying in Myanmar in bringing in the equipment and providing the services necessary for accomplishment of the project on the Japanese side.
- 9) Bearing the necessary expense of the formalities connected with the bank agreement (B/A) and authorization of payment (A/P).
- 10) Allocation of the necessary budget and assignment of the necessary personnel (including funds for maintenance of the equipment procured on the basis of grant aid) for effective implementation of the project.
- 11) Assumption of responsibility for the work and expense of appropriate and effective maintenance of the equipment procured on the basis of grant aid.



- 12) Granting of the permits, licenses and other authorizations needed for implementation of the grant aid project.
- 13) Bearing of the expense of tax exemption formalities.
- 14) Bearing of any other expenses not included in the scope of responsibilities of either the Japanese side or the Myanmar side that are necessary for implementation of the project.

#### **2-2-4-4 Consultant Supervision**

In accordance with Japan's grant aid system a Japanese consultant company will conclude a consulting services contract with the implementing entity on the Myanmar side, the Health Department, to serve as a basis for accomplishment by it of the working design and procurement supervision of the project. The purpose of such supervision of procurement is that of checking whether or not the work processes and content are being carried out in accordance with the design documents and providing guidance, advice and coordination from a fair standpoint for ensuring proper performance of the equipment procurement contracts, thereby working for enhancement of quality, and it consists of the following work:

(1) Work relating to the tender bids and supplier contracts

Carrying out of the work involved in the tender for selection of the Japanese contractor for procurement of the equipment and accomplishment of the installation work, such as preparation of the tender documents, public announcement of the tender, receiving of the applications for participation in the tender, screening of the applicants regarding whether or not they are qualified to participate, distribution of the tender documents, receiving of the bids and bid documents and assessment of the proposals and awarding of the contract as well as providing advice regarding conclusion of the equipment procurement and contractor services contract between the Myanmar side and the Japanese contractor.

(2) Guidance, advice and coordination for the benefit of the equipment procurement company

Study of the work process and work implementation plans, the materials procurement plans, the medical equipment procurement and installation plans, etc. and furnishing the equipment procurement company with guidance, advice and coordination.

(3) Review and approval of the production drawings, work drawings, etc.

Review of the work drawings, production drawings and documents, etc. submitted by the equipment procurement company, furnishing it with guidance concerning them and approving them.

(4) Checking and approval of the procured equipment

Checking of congruity between the contract documents and the medical equipment procured by the equipment procurement company and granting of approval of use thereof.

(5) Inspection at the plant

When necessary, witnessing of inspection of the medical equipment at the production plant to make sure of its quality and performance.

(6) Reporting on the state of progress of the work processes

Reporting to the authorities concerned of both countries on the state of progress of the work processes and the situation at the place where the work is being done.

(7) Inspection at completion of the work and trial operation

Inspection of the medical equipment and facilities at completion of the work and carrying out of trial operation, checking of congruity with the contents of the contract documents and issuing of a certificate of completion of inspection to the Myanmar side.

(8) Guidance concerning operation and maintenance technical training

Since some of the planned equipment requires technical knowledge concerning operation and maintenance, it is necessary to implement training of those in charge of the different equipment at the facility during the period of installation, adjustment and trial operation in order for them to learn how to operate it, how to carry out checks and inspections on it, repair techniques, etc., and the consultant is to provide guidance and advice concerning that.

In accomplishing the above-mentioned work, considering the scale of the project, the consultant need not assign personnel in Myanmar throughout the entire period of implementation of the project for involvement in the inspection, guidance and coordination work there but rather in accordance with the state of progress and must also assign technical personnel in Japan who are in charge of the project and establish a basis for liaison with and support of the work going on in Myanmar. The consultant is also to report to the Japanese authorities concerned on the state of progress of the project, payment formalities, acceptance and other necessary matters. It might be added that there no matters that might be problematic concerning Myanmar's laws and regulations or its labor situation.

## **2-2-4-5 Procurement Plan**

### **(1) Procurement Plan for the Equipment**

#### **1) Local Equipment**

In the way of medical equipment in Myanmar there is production of patient beds, equipment stands and cabinets, etc., but there is no item in this project that corresponds to such equipment.

#### **2) Policy Concerning Use of Products of Third-Party Countries**

In Myanmar both Japanese products and products of third-party countries (Western countries) are being used, and both Japanese and third-party country manufacturers have local agencies there. Assuming limitation to manufacturers with an agency in Yangon, it would in general be possible to cope with only Japanese manufacturers, but since it would not be possible to ensure enough competition with just Japanese manufacturers in the case of some of the equipment, such as patient monitors, ventilators, anesthesia apparatus and automatic biochemical analyzer, the products of third-party country manufacturers will also be considered.

#### **3) Information Concerning After-Sales Service, Etc.**

Regarding after-sales service, the equipment normally has a 1-year period of guarantee starting from delivery, and for the main equipment maintenance contracts are concluded for after the period of guarantee. Furthermore, in the present situation servicing of other equipment is accomplished as needed. In this project, too, it is intended to have a 1-year period of guarantee for the procured equipment starting from delivery thereof.

### **(2) Transportation Time**

Equipment procured from Japan takes about 2 weeks for marine transportation, and that from third-party countries (mainly Western countries) 2-3 weeks. Customs clearance takes about 1 week, and inland transportation in Myanmar about a half a day. The total transportation time from Japan is therefore about 3 weeks. The equipment is brought to the hospital in question by container from the Port of Yangon, the country's largest port. In the procurement plans ample time leeway will be given for unloading, customs clearance, etc.

### **(3) Transportation and Packing Plans**

The equipment will be transshipped at the Port of Mottama to be brought by smaller vessel to the Port of Yangon for unloading, followed by transportation to the project site, the Yangon General Hospital, the Japanese side bearing the cost of inland transportation. The equipment will be packed in watertight wooden cases for shipment. The transportation time for

equipment from Japan is about 2 weeks for marine transportation, and it is 3-4 weeks for marine transportation from third-party countries (mainly the U.S.A.). Customs clearance takes about 1 week, and transfer from the Port of Yangon to the project site takes about 15 minutes. That means a total transportation time requirement of about 5 weeks. The equipment will be transported from the port to the hospital in containers. In the procurement plans ample time leeway will be given for unloading, customs clearance, etc.

The procured equipment will be transported by mixed mode (marine and truck transportation). Since there is a paved road from the port to the project site, there should not be any problems regarding transportation infrastructure.

#### **2-2-4-6 Implementation Schedule**

After conclusion of the exchange of notes between the two countries concerning implementation of the project, the implementation process will consist of three stages as described below-the detailed design work, the tender work and the equipment procurement work. The detailed design work and the tender work constitute implementation design.

##### **(1) Detailed Design Work**

After conclusion of the consulting services contract between the Health Department in representation of the Government of Myanmar and the Japanese consultant detailed design by the consultant will start once the contract has been approved by the Japanese Government. In the detailed design stage there will be preparation of the set of tender design documents, including detailed design drawings, specifications and terms of reference. During that stage there will be discussions with the Myanmar side concerning the content of the equipment, and the Myanmar side's approval of the finalized set of tender design documents will be obtained. The design work, including detailed design, work in Japan and approval of the documents, is expected to take about 3 months.

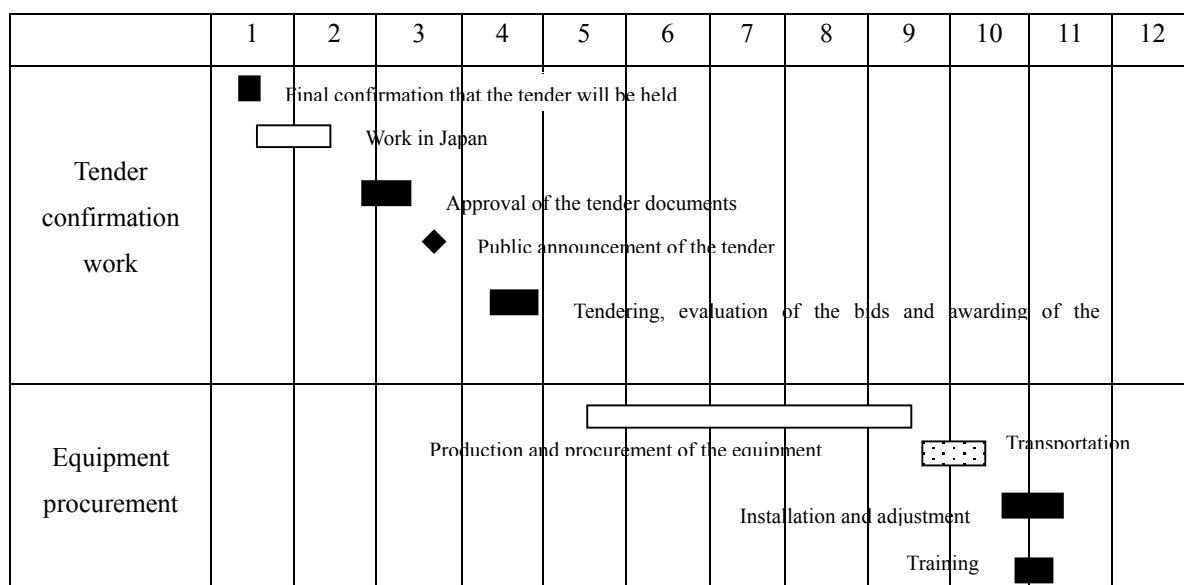
##### **(2) Tender Work**

The contractor for procurement of the equipment will be selected by tender. The tender will be carried out in the order: public announcement of the tender, receiving of applications for participation in it, screening the applicants regarding eligibility, distribution of the tender documents, receiving of the bids, evaluation of the bids and selection of the successful bidder, reporting of the outcome of the tender, designation of the equipment procurement contractor and conclusion of the equipment procurement contract. The whole process should take about 2 months.

##### **(3) Equipment Procurement**

After conclusion of the contract with the contractor the contract work will start once the contract has been approved by the Japanese Government. Taking into account the content and scale of the facilities covered by the project, the content of the contract, the climatic conditions, etc., it has been estimated that the work will take about 5.5 months. The implementation schedule from conclusion of the exchange of notes to completion of the work will be as indicated below:

**Table 2-4 Implementation Schedule**



□ Work in Japan  
 ■ Work in Myanmar

**2-3 Obligations of Recipient Country**

As of December 2000 the Myanmar side is carrying out repair work at the emergency/out-patient department, the plans calling for all such facility repair work to be carried out as that side's responsibility regarding both implementation and cost, and the hospital has already secured the budget for the work, the content of which is indicated in Table 2-5 below:

**Table 2-5 Content of the Work for Which the Myanmar Side Is Responsible**

Designation of the work	Content of the work	Required budget
Building repair work	Changing position of partition walls at the facility - Modification of the walls of rooms with air - Modification of the walls of the radiation room - Construction of transformer/generator room	About ¥1,200,000
Distribution wiring work	Distribution wiring from the distribution panel to the different rooms in the department in question	About ¥1,000,000
Air conditioning installation work	Procurement and installation of air conditioners in the CT room, radiation room and ultrasonic examination room	About ¥800,000
Water supply and drainage piping work	Change of position of water supply and drainage piping of hand washing and sterilization apparatus	About ¥200,000
Total amount		About ¥3,200,000

## 2-4 Project Operation Plan

### (1) Analysis of Present Situation:

Table 2-6 gives the hospital's actual income and expenditure figures for the 3-year period 1997-1999. The cost sharing system introduced in 1997 sets particular prices for each of the different medical care services, the prices at the Yangon General Hospital being lower than at other public medical facilities and private hospitals, clinics, etc. Persons who have been issued poverty certificates by the authority concerned are entitled to medical care free of charge.

Remuneration for medical care services is steadily increasing year by year, and the hospital's overall income-expenditures balance was a surplus of about 12.6 million yen in 1999 at the actual exchange rate at that time. Basically, it is a system under which new medical equipment, spare parts, reagents, consumables, etc. are supplied free of charge by the Central Medical Store Depot (CMSD), a procurement agency operating under the Ministry of Health, but we have calculated the amounts corresponding to those items and included them as income and expenditure items. Furthermore, the hospital also receives donations and assistance from NGO, other organizations and individuals as well as gifts of mainly medicaments and consumables. It even receives some grants of ambulances and clinical testing and other medical equipment.

**Table 2-6 Actual Past Income and Expenditure Figures of the Yangon General Hospital  
(1997-1999)**

#### <Income>

Description	1997		1998		1999	
	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year
Government budget	28,716,140	-4	32,796,260	14	33,353,008	2
Contributions and assistance	6,330,301	7	17,230,781	172	27,493,267	60
Remuneration from medical care services	35,072,455	73	38,215,272	9	58,612,646	53
Other income (credit fund, etc.)	—	—	16,809,000	—	766,500	-95
Procurement of equipment through the CMSD	5,900,000	—	4,950,000	-16	39,500,000	698
<b>Total income (A)</b>	<b>76,018,896</b>	<b>36</b>	<b>110,001,313</b>	<b>45</b>	<b>159,725,421</b>	<b>45</b>
Carried forward from the year before	26,696,474	—	31,885,318	19	42,781,876	34
<b>General total</b>	<b>102,715,370</b>	<b>—</b>	<b>141,886,631</b>	<b>38</b>	<b>202,507,297</b>	<b>43</b>

**<Expenditures>**

Description	1997		1998		1999	
	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year
Personnel expenses	17,344,578	2	18,816,532	8	19,111,025	2
Medicaments	5,028,721	154	9,553,521	90	5,544,014	-42
Patient meals	—	—	1,200,000	—	1,101,735	-8
Procurement of equipment (through the CMSD)	5,900,000	—	4,950,000	—	39,500,000	698
Medical equipment consumables	1,722,000	-14	2,513,250	46	14,794,771	489
Maintenance (building and facilities)	—	—	2,313,250	—	2,766,481	20
Maintenance (vehicles)	—	—	696,100	—	571,000	-18
Repayment of government loan	8,768,114	—	9,553,818	—	14,653,162	53
Facility repairs	5,370,165	350	8,603,616	60	5,208,495	-39
Communications, lighting, heating and other utilities	—	—	9,019,350	—	10,002,708	11
<b>Total expenditures (B)</b>	<b>44,133,578</b>	<b>51</b>	<b>67,219,437</b>	<b>52</b>	<b>113,253,391</b>	<b>68</b>

**<Balance of income and expenditures>**

Description	1997		1998		1999	
	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year	Kyat	% Comparison with preceding year
Overall balance (A - B)	31,885,318	19	42,781,876	34	46,472,031	9
Dollar equivalent (US\$)	79,713.30	19	106,954.69	34	116,180.08	9
Yen equivalent	8,609,036	19	11,551,107	34	12,547,448	9

Note: Exchange rates: US\$1.00 = 400 kyat = 108 yen.

**(2) Maintenance Budget:**

In actual past figures expenditures for medical equipment consumables have been the third highest ranking item, coming to 14.79 million kyat (equivalent to about 4 million yen) in 1999. Since another 8.6 million kyat (equivalent to about 2.3 million yen) was spent as maintenance expenses, total upkeep expenses came to about 6.3 million yen. Table 2-7 gives the upkeep expenses for the medical equipment to be procured in the present project.



**Table 2-7 The upkeep expenses for the medical equipment to be procured**

Description	Spare Parts/Supplies	Annual Total Amount (Kyats)	Annual Total Amount (US\$)
Defibrillator	Recording paper, gel	105,000	0
ECG	Electrodes, recording paper	2,268,000	0
Bedside Monitor	Electrodes, recording paper	0	1,600
Ventilator	Patient circuit	0	4,000
	Bacterial filter	3,200,000	0
Ventilator (Portable)	Patient circuit, Bacterial filter	4,040,000	0
Sterile Hand-washing Equipment	UV lamp	0	400
	Water filter	600,000	0
Electro Surgical Unit	Knife holder	105,000	0
Anesthetic Apparatus (with Ventilator)	Soda lime, Anesthetic, Medical gas, etc.	10,525,000	0
Operating Light (Ceiling Type)	Halogen lamp	900,000	0
Operating Light (Portable, with Battery)	Halogen lamp	300,000	0
Ultrasonic Scanner	Gel	3,500,000	0
	Probes (convex/linear)	0	6,000
CT Scanner	Bulb	0	20,000
	Laser film, Maintenance contract	5,750,000	0
X-ray unit (with accessories)	Lamp		15,000
	X-ray film, Maintenance contract	69,300	0
X-ray Film Processor Unit	Developer & fixative	1,275,000	0
Biochemical Analyzer	Gasket set,	0	1,000
	Reagents	11,000,000	0
Switch Board System	Diesel gas, Oil filter	104,000	0
Additional Maintenance Cost related to Equipment Procurement	Total of all procured equipment	43,741,300	32,000
	Total of all procured equipment (yen)	11,810,151	3,456,000
	Total of newly included equipment	7,600,000	12,000
	Total of newly included equipment (yen)	2,0520,000	1,296,000
Additional Utility Cost		600,000	0
General Total		44,341,300	32,000
General total (yen)		11,972,151	3,456,000

Note: Exchange rates: US\$1.00 = 400 kyat = 108 yen.

Since the content of the planned equipment is mostly equipment to replace the existing equipment, the real increase is only about 3.5 million yen. Of that, about 40% (Bulb of CT scanner, Lamp of X-ray, Patient circuit of Patient Monitor, and Probes of Ultrasonic scanner, etc.) has to be paid in foreign exchange, but the Minister of Health has made a firm promise regarding availability of that amount.

(3) Future Outlook Regarding Income/Expenditures Balance:

Table 2-8 gives estimated projections of the income/expenditure balance for the 6-year period 2000-2005 on the basis of the actual figures for the past 3 years.

**Table 2-8 Estimate Income and Expenditure Figures of the Yangon General Hospital (2001-2005)**  
**<Income>**

Description	2000	2001	2002	2003	2004	2005
	Kyat	Kyat	Kyat	Kyat	Kyat	Kyat
Government budget	34,720,066	36,143,157	37,624,576	39,166,716	40,772,064	42,433,211
Contributions and assistance	28,318,065	29,167,607	30,042,635	30,943,914	31,872,232	32,828,399
Remuneration from medical care services	61,543,278	64,620,442	67,851,464	71,244,038	74,806,239	78,546,551
Other income (credit fund, etc.)	522,651	356,378	243,003	165,695	112,982	77,039
Procurement of equipment through the CMSD	6,195,000	6,504,750	6,829,988	7,171,487	7,530,061	7,906,564
<b>Total income (A)</b>	<b>131,299,060</b>	<b>136,792,334</b>	<b>12,591,666</b>	<b>148,691,850</b>	<b>155,093,578</b>	<b>161,801,764</b>
Carried forward from the year before	46,472,031	47,158,258	37,202,254	43,001,586	49,101,770	55,503,498
General total	177,771,091	183,950,592	179,793,920	191,693,436	204,195,348	217,305,262

**<Expenditures>**

Description	2000	2001	2002	2003	2004	2005
	Kyat	Kyat	Kyat	Kyat	Kyat	Kyat
Personnel expenses	19,866,101	20,651,009	21,466,930	22,315,087	23,196,755	24,113,258
Medicaments	6,652,817	7,983,380	9,580,056	11,496,067	13,795,281	16,554,337
Patient meals	1,071,662	1,042,410	1,013,957	986,280	959,359	933,172
Procurement of equipment (through the CMSD)	6,195,000	6,504,750	6,829,988	7,171,487	7,530,061	7,906,564
Medical equipment consumables	16,274,248	26,797,673	29,477,440	32,425,184	35,667,703	39,234,473
Maintenance (building and facilities)	2,947,185	3,139,635	3,344,683	3,563,122	3,795,828	4,043,731
Maintenance (vehicles)	536,794	504,637	474,407	445,988	419,271	394,154
Repayment of government loan	15,385,820	16,155,111	16,962,866	17,811,009	18,701,560	19,636,638
Facility repairs	5,208,495	5,208,495	5,208,495	5,208,495	5,208,495	5,208,495
Communications, lighting, heating and other utilities	10,002,708	11,602,979	12,763,277	14,039,604	15,443,565	16,987,921
<b>Total expenditures (B)</b>	<b>84,140,803</b>	<b>99,590,080</b>	<b>99,590,080</b>	<b>99,590,080</b>	<b>99,590,080</b>	<b>99,590,080</b>

**<Balance of income and expenditures>**

Description	2000	2001	2002	2003	2004	2005
	Kyat	Kyat	Kyat	Kyat	Kyat	Kyat
Overall balance (A - B)	47,158,258	37,202,254	43,001,586	49,101,770	55,503,498	62,211,684
Dollar equivalent (US\$)	117,895.64	93,005.64	107,503.97	122,754.42	138,758.75	155,529.21
Yen equivalent	12,732,730	10,004,609	11,610,428	13,257,478	14,985,945	16,797,155

For the income/expenditures balance starting from 2000 basically a projected rate of increase over the preceding year equivalent to the medium value of those for the last 3 years has been set, and the assumption for the projection has been a trend in the direction of leveling off of both income and expenditures, without any extreme rates of increase. However, for items that have shown extreme rates of increase in the past the projected rates of increase have been set separately for each item.

The largest item of income is remuneration for medical care services. Since the rate of increase is unstable immediately after introduction of cost sharing, the projected rate of increase over the preceding year has been set at 5% to be on the safe side although the figure for 1998, the lowest in the past 3 years, was 9%. The figures for other income items have also been set rather low on the assumption that they, too, will gradually come to increase less and less.

Regarding expenditure items, too, although there has been considerable change in the actual rates of increase of items like procurement of medicaments, procurement of medical equipment consumables, facility repairs and communications and lighting, heating and other utilities, the projected rates of increase have been set on the basis of the assumption that there will no longer be extreme increases. It has been projected that in 2001, the year of delivery of the planned equipment, there will be an increase of about 3.3 million yen in expenditures, the problem of what the exchange rate will be then not being considered. The percentage that the expense of upkeep of the planned equipment represents of total expenditures is 19% with the actual figure for the latter in 1999 and 21% with the projected figure for 2001, and although a surplus is maintained in 2001, it is projected as being less than that for the year before.

The projection is for further stabilization of cost sharing starting in 2002, with income from medical care services moving in the direction of greater stability, improvement year by year in the income/expenditure balance and recovery of the surplus to about the same level as for 1999 around 2002 or 2003. That being the case, it is considered on the basis of actual past figures and the future outlook concerning the income/expenditure balances that upkeep of the equipment to be procured in the project will be more than possible.

#### (4) Maintenance System:

Hospital maintenance can be roughly divided into three categories: A) building, electricity, water supply and sewer service maintenance, B) medical gas maintenance and C) medical equipment maintenance:

- A) For building, electricity, water supply and sewer service maintenance, there are 9 people in the Building Section (1 building technician and 8 skilled workers), 14 in the Electrical Section (1 electrical technician, and 13 electrical workers) and 12 in the Water Supply and Sewer Service Section (Technician of Boiler and Autoclave, Plumber, etc.).
- B) In the hospital's organizational scheme medical gas maintenance functions as a section of the medical store in the ward department.
- C) As for medical equipment, it's the responsibility of the workshop section, which is organizationally belongs to the Diagnosis Department. 3 electronics technicians with training experience in Japan and elsewhere and 5 skilled workers that section. The basic maintenance can be handled in the hospital, but they have maintenance contracts with the local agencies for the radiology and the ultrasonic apparatus. When it is difficult to meet maintenance needs with the hospital's own technical personnel, they turn to external private companies.

Since there are a number of manufacturers' agencies in Yangon, all of them with plenty of experience, it is considered that there should not be any problems regarding technical level or procurement of reagents or consumables in connection with any maintenance work that might be necessary.

## **CHAPTER 3**

# **PROJECT EVALUATION AND RECOMMENDATION**

## CHAPTER 3. PROJECT EVALUATION AND RECOMMENDATIONS

### 3-1 Project Effect

The following beneficial effects can be expected of implementation of the project:

#### (1) Direct Beneficial Effects

- 1) With things like replacement of the radiation equipment, the images of which have become unclear as a result of lower output, the CT, which takes too much time for examinations because of its old specifications, and other key equipment, it will be possible to have more efficient and smoother examination, and improvement of faulty operation equipment will improve treatment functions.
- 2) Whereas in the present situation dispersed location and partial overlapping of radiation rooms and dark rooms require more staff and upkeep expenditures than would otherwise be necessary, the building repair work being done by the local side and this project will concentration such functions and make for more efficient operation and upkeep.
- 3) As a result of provision of the equipment in this project the department's patient load will be lightened by reduction of testing and examination time, more appropriate operations and treatment, post-operation observation, etc., and that will make it possible to handle more patients.

#### (2) Indirect Beneficial Effects

- 1) More appropriate medical care services for emergency patients and out-patients will shorten stays in the hospital, making it possible to accept more patients, and will lower the death rate.
- 2) With recovery of functions that the department ought to have but has not be able to adequately fulfill, the hospital will be able to meet its obligations as a referral facility, including furnishing of better technical guidance to other medical facilities and provision of more appropriate medical care services to patients referred to it.
- 3) Although the hospital in question has medical personnel who have studied abroad and others who have received considerable training, in the present situation the hospital environment is not such as to make it possible to make the most of their experience and skills. With the improvements in the department in question through this project, it will become possible to do just that.

4) Although as the country's top referral hospital the hospital in question conducts training activities for the benefit of medical personnel, it is not able to do so on an ongoing basis because of the inadequacies of its existing equipment. After implementation of the project it will be able to accomplish better training activities through use of the newly procured equipment.

### **3-2 Recommendations**

#### **(1) Master plan of the hospital**

Myanmar side recognizes the importance to renew the superannuated building, facilities and medical equipment. Although Yangon General Hospital have been improved building and some medical equipment by the own budget. It still has difficulties to proceed improvement without Master plan of the Hospital.

The coverage area of the improvement by the Project shall be Emergency and Outpatient department only. Therefore, Master plan for the improvement of the hospital shall be required for future improvement. The remaining problems are as follows.

##### **1) Building**

There are many crack on the floor and wall of buildings and it has the doubt in the point of view of safeties. Leakage of water, crack on the floor had been shown and it is necessary to renovate the buildings. Especially, main building had been more than 100 years since the hospital had been established. Unfortunately, renovation had been carried out without master plan and it had made more complicated movement of medical staff and workload for the patient. Therefore, it is important to continue the self-effort.

##### **2) Facilities**

All of water pipings and drainage, electrical system and gas system shall be improved urgently. Those facilities have problems such as over-aged, shortage of capacity and difficulties for maintenance. Additionally, there was inappropriate electrical wiring. Therefore, proper operation and management effort is required.

##### **3) Medical Equipment**

It is necessary to improve Yangon General Hospital by self-effort as the top referral and teaching hospital in Myanmar concerning the selection of equipment to be purchased, consideration for features, generation, availabilities of the agent of manufacturer.

In the presence of sophisticated equipment, at the other hand, basic equipment is not enough. It is considered that more basic equipment shall be purchased more.

(2) Emergency system

There is referral system in the city of Yangon. However, it is needed to improve emergency service system for the future incensement of the patient. Telephone number of “199” is to inform the police station only and not for other facilities. There is the case that the hospital could not prepare to receive patient because of lack of telecommunication system.