

**BASIC DESIGN STUDY ON THE PROJECT
FOR
THE IMPROVEMENT OF MEDICAL EQUIPMENT FOR
JORDAN UNIVERSITY HOSPITAL
IN
THE HASHEMITE KINGDOM OF JORDAN**

MARCH, 1998

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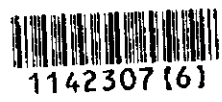
**JAPAN INTERNATIONAL COOPERATION AGENCY (JICA)
INTERNATIONAL TECHNO CENTER CO., LTD**

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PREFACE

In response to a request from the Government of Hashemite Kingdom of Jordan, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of Medical Equipment for Jordan University Hospital and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Jordan a study team from October 3 to November 1, 1997.

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

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

I wish to express my sincere appreciation to the officials concerned of the Government of Hashemite Kingdom of Jordan for their close cooperation extended to the teams.

March, 1998



Kimio Fujita
President
Japan International Cooperation Agency

March, 1998

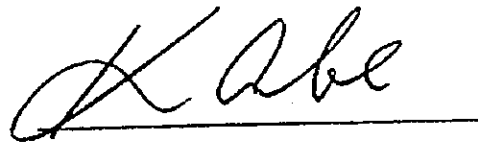
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Improvement of Medical Equipment for Jordan University Hospital in the Hashemite Kingdom of Jordan.

This study was conducted by International Techno Center Co., Ltd., under a contract to JICA, during the period from September 22, 1997 to March 31, 1998. In conducting the study, we have examined the feasibility and rationale of the project with due consideration to the present situation of Jordan and formulated the most appropriate basic design for the project under Japan's grant aid scheme.

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

Very truly yours,

A handwritten signature in black ink, appearing to read 'K Abe', is written over a horizontal line.

Kazuhiro Abe

Project manager

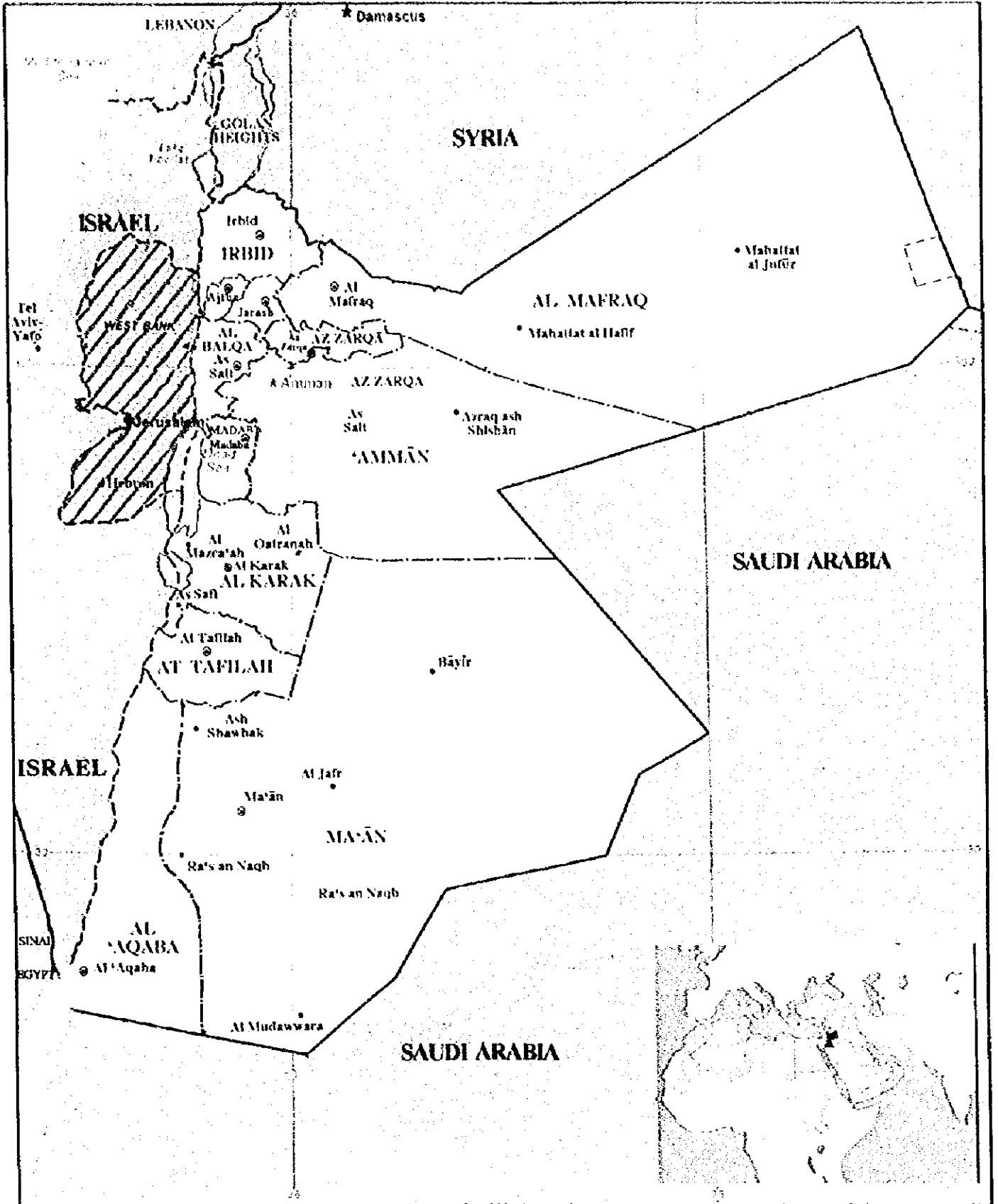
Basic design study team on

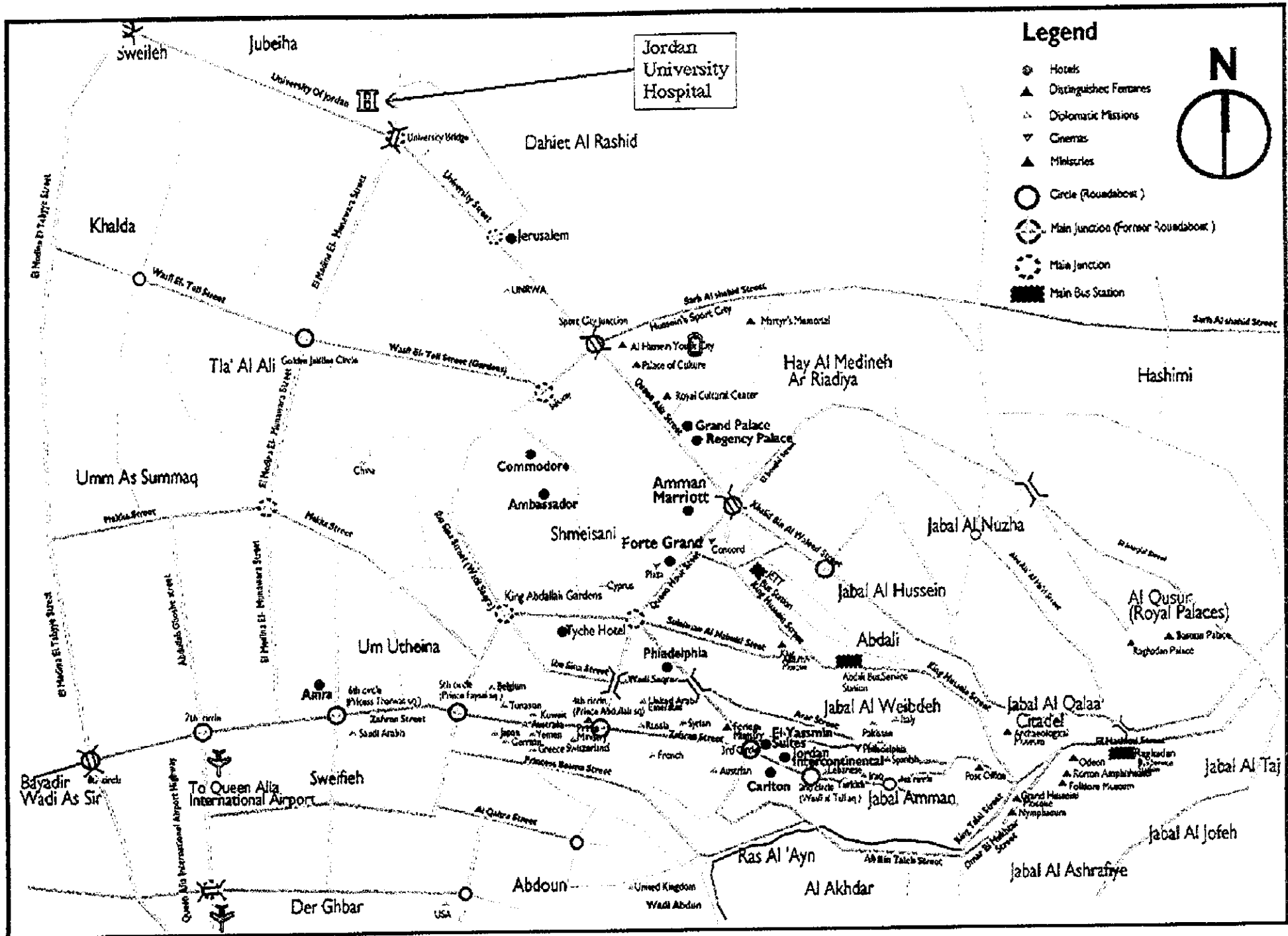
the Project for the Improvement

of Medical Equipment for Jordan University Hospital

International Techno Center Co., Ltd.

Map of Jordan





Map of Amman City

Abbreviation

IMF	International Monetary Fund
E/N	Exchange of Notes
CCU	Coronary Care Unit
GNP	Gross National Product
B.M.	Bachelor of Medicine
M.D.	Medical Doctor
JD	Jordanian Dinor
PL	Products Liability
ICU	Intensive Care Unit
PCM	Project Cycle Management
EFF	Expanded Fund Facility

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CHAPTER 1 BACKGROUND OF THE PROJECT

Chapter 1 Background of the Project

1-1 Background of the Project

The Hashemite Kingdom of Jordan (to be referenced as "Jordan" hereafter) is bordered by Syria on the north, Iraq on the northeast, Saudi Arabia on the east and south, and by Israel on the west. The entire area of Jordan is 92,000 km², about a quarter of the area of the national land of Japan. Its national land is divided into mountainous area on the western side and flat desert on the eastern side. Approximately 80% of the national land consists of deserts and barren lands. The total population of Jordan is 4,291,000 (as of 1995) and the increase rate of population is 3.6% (as of 1994).

After the World War II, Jordan declared independence in 1946 and changed its name to the present one in 1950. The fifty-years' history of Jordan has close relationship with the Palestine problem which caused the First Middle East War. In the Third Middle East War started in 1967, Jordan was destroyed almost completely. In addition, since the cultivate lands in Jordan account for only 6% of the entire national land, foods were not self-sufficient. Thus the necessary supplies must be imported, causing constant trade deficit, in which the amount of import has been more than twice of that of export. Jordan also suffered significantly from monetary crisis in the latter half of 1988, stop of oil trade by the Gulf War after August 1990, stop of support from oil producing countries of Gulf area, decrease of remittance caused by the returning of overseas workers which was assumed to have reached 300,000, and the decrease of income from tourism.

With the start of the Middle East Peace Process in October 1991, the privatization of public undertakings in 1991, and the implementation of the Economic Adjustment Plan (1992 to 1998), the economy of Jordan turned favorably in 1992 with the economic growth rate of 11.3%. When the Peace Agreement was concluded with Israel in 1994, the deficit of international balance was reduced with the provision of EFF from the IMF in 1994 as well as the foreign currency reserve increased, resulting in favorable economic growth. However Jordan still has problems in the improvement of macro index and in relating the favorable economic growth with long-term structural reform. Therefore, patients tend to concentrate in the nucleus hospitals and the top referral hospitals complete with relatively much equipment, making the referral system not functioning sufficiently.

With regard to the health care situation of Jordan, the number of the cases of respiratory diseases was still the highest (39.1%) in the disease structure of 1996 when compared with that of 1992. However, infectious diseases having the second highest morbidity in 1992 and parasite diseases decreased from 12.2% to 8.8%. Instead, cardiovascular diseases have the second highest morbidity (9.9%). As the main causes of death, cardiovascular diseases were still the highest accounting for about 40% of the entire death cases, followed by accidents including traffic accidents, then pulmonary infectious diseases. The infant mortality was 28/1,000 (as of 1994) and the mortality of pregnant women was 28 out of 100,000 deliveries (as of 1994). From the above mentioned, it could be said that the health care situation in Jordan is better than that of other underdeveloped countries. However because of the above mentioned economical crisis, necessary budget for national medical facilities cannot be secured sufficiently, which is the common problem of national medical facilities. Especially the reduction of capital expenditure has prevented the rehabilitation of necessary facilities and the replacement of medical equipment.

On the other hand, educational level in Jordan is high with the rate of illiteracy of 14.9% according to the statistic in 1994. Thus Jordan sends medical engineers to other countries in the Middle East. Jordan also has developed its own clinical education system of medical employees since the beginning of 1970s. Because the level of the medical education in Jordan is very high, many students aiming at medicine are visiting Jordan from neighboring Middle East countries at present. In Jordan, only two national universities have medical schools (Jordan University and the University of Science and Technology) but no private universities has medical school. In addition, there are twenty-six national and private colleges of two-year system that bring up the paramedical staffs such as nurses, radiology engineers, and laboratory engineers.

Under these circumstances, the university positioned at the top of the medical education of Jordan is Jordan University Medical School. At the Jordan University, approximately 60% of the educational staffs of the entire Jordan such as professors work and six hundred and ten undergraduate students and one hundred seventy-seven graduate students are registered. The Jordan University Hospital (to be referenced as "JUH" hereafter) plays important roles as the facility of clinical education to these students. The JUH was established as the Amman Municipal Hospital in 1973 being the national medical facility located in the city of Amman, the capital of Jordan. After 1995, the JUH has been playing important roles in securing the technical level of medical fields as the only medical facility that can implement tertiary medical services as the top referral facility

of Jordan and conducting the training for interns as well as providing clinical education and training to the students not only of medical schools but of dentistry, pharmacology, and nursing. In addition, the JUH contributes to the maintenance and development of medical technology of Jordan by implementing most of the after-graduate training of medical employees.

In 1997, the JUH formulated a Hospital Strengthening Plan for the purpose of rehabilitating the facilities, procuring the equipment, and improving the hospital management system to strengthen its present functions. This Strengthening Plan declared the following objectives.

- 1) To start new services such as cardiac catheter or cardiovascular departments
- 2) To improve/strengthen a part of services at cardiology care unit (CCU) or burn unit
- 3) To extend the consultation hours
- 4) To change the wage structure of doctors from the fixed rate to the piece work system
- 5) To add private rooms
- 6) To improve consumables, drugs, and accounting system

In order to implement this Strengthening Plan, the JUH decided to use a part of the Economic Adjustment Plan promoted by the government of Jordan with the support of the World Bank and the IMF to improve the facilities and procure some items of the equipment after making discussions with the Ministry of Finance and the Ministry of Planning of Jordan and to implement the Plan with the support of France and Switzerland. However the decrepit state of the existing departments which are not included in the Strengthening Plan is remarkable. Thus the JUH requested the support of Japanese grand aid for the necessary funds to replace and supplement the equipment and procure some of the new equipment which are included in the Hospital Strengthening Plan but not supported by other organizations.

1-2 Outline of the Request and main Components

1) Objectives of the Request

The JUH plays important roles in the field of clinical education of Jordan by being not only the top referral facility of national medical facilities in doing medical

treatments among the health and medical system of Jordan, but the educational hospital by providing education to the medical students and securing the technical level of medical employees. However the levels of medical services, education, and researches of the JUH have lowered due to decrepit equipment it has at present. Thus the request was made for the purpose of recovering the original functions of the JUH.

2) Implementation agency

The implementation agency of this Project is the Jordan University Hospital (JUH).

3) Contents of the requesting departments

The requesting departments in this Project are as follows.

1. Anesthesiology (recovery) department
2. Radiology department
3. Surgical department: cardiac surgery and general surgery
4. Obstetrics and gynecology department
5. Special treatment departments: ICU-surgery, pediatric ICU, intensive medical care unit, gastroenterology, and burn unit
6. Physiotherapy department
7. Internal medicine department: cardiology
8. Nursing department: wards and CSSD
9. Specialized surgical department: ear, nose, and throat (ENT), neurosurgery, ophthalmology, orthopedic surgery, urology, and thoracic surgery
10. Laboratory

4) Contents of the requested items/main equipment

Because the equipment was originally requested about two years ago, the request was made again this time during the site study, and the final list of equipment was submitted through the discussions with the JUH. As a result of discussions and examinations, it was determined that a further discussion and examination should be made based on the submitted final list of equipment. The requested main equipment is as follows.

Table 1-1 Requested Main Equipment

	Requesting Department	Requested Main Equipment
1	Anesthesiology (recovery)	Bed, Patient monitor, ECG, Defibrillator
2	Radiology	CT-Scanner, X-ray, Film developer
3	Surgical / cardiac	Heart-lung machine, Defibrillator, Infusion pump
	Surgical / general	Operating table, Suction pump, Electro-surgical unit
4	Obstetrics and gynecology	Fetal monitor, Operating light, U/S machine
5	ICU-surgery	Bed, Patient monitor, ECG, Defibrillator
	Pediatric ICU	Bed, Patient monitor, ECG, Infant warmer
	Intensive medical care unit	Bed, Patient monitor, ECG, Ventilator
	Burn unit	Bed, Patient monitor, ECG, Ventilator
6	Physiotherapy	Bath, U/S therapy, Electric therapy
7	Cardiology	Bed, Patient monitor, ECG, Ventilator
8	Nursing department	Blood flow meter, Patient monitor, ECG, Ventilator
	CSSD	Steam sterilizer
9	Ear, nose, and throat (ENT)	Evoked potential machine, Examination unit
	Neurosurgery	U/S machine
	Ophthalmology	laser system, Examination unit, Perimeter
	Orthopedic surgery	Laser system, Micro endoscopic set
	Urology	Urodynamic machine, Endoscopic set
	Thoracic surgery	Video Bronchoscope
10	Laboratory	Centrifuge, Blood coagulation analyzer

CHAPTER 2 CONTENTS OF THE PROJECT

Chapter 2 Contents of the Project

2-1 Objectives of the Project

In the Third Five Year Economic and Social Development Plan 1993 - 1997, the Hashemite Kingdom of Jordan (to be referenced as "Jordan" hereafter) declared the "improvement of medical services to the entire nation" for the health and medical sector and the "further improvement of the level of higher education" for the higher education sector as the objectives.

The Jordan University Hospital (to be referenced as "JUH" hereafter), the subject facility of this project, plays an important role in securing the technical level of medical services by providing not only tertiary medical services as the top referral hospital in Jordan but clinical education and training to those related to the medical services. However the original functions of JUH have been markedly reduced because JUH has not been able to provide sufficient medical services and clinical education since the 1980s due to its decrepit equipment.

One of the objectives of this Project is to fulfill the functions of the JUH as the top referral facility of health and medical services by replacing and supplementing medical equipment and procuring some items of equipment in accordance with the upper level improvement project of the JUH. In addition, the objectives include the qualitative and quantitative improvement of the education of medical employees and medical services to the nation of Jordan not only by recovering the level of the JUH as the clinical educational institute to that of the 1980s which conformed to the international level but by increasing the level of the JUH to the international level which had been raised with the rapid progress of medical technologies

2-2 Basic concept of the Project

The Jordan University Hospital (JUH) decided to procure the MRI and the equipment for cardiac catheter using a part of the Economic Adjustment Plan being proceeded with the support of the World Bank and implement the rehabilitation of facilities with the supports of France and Switzerland in order to strengthen its present functions. However in 1997, the JUH added a new plan aiming at the improvement of the hospital management system and formulated a Hospital Strengthening Plan. This Strengthening plan declared the following items.

- 1) To start new services such as cardiac catheter or cardiovascular departments
- 2) To improve/strengthen a part of services at cardiology care unit (CCU) or burn unit
- 3) To extend the consultation hours
- 4) To change the wage structure of doctors from the fixed rate to the piece work system
- 5) To add private rooms
- 6) To improve consumables, drugs, and accounting system

In order to implement this strengthening plan, the JUH requested from the government of Japan the grant aid cooperation for the funds necessary for replacing and supplementing the equipment having been significantly decrepit and procuring some of the equipment at the existing departments which have been included in the hospital strengthening plan but not to be supported by other organizations.

At the beginning of the discussion, the Study Team held a PCM workshop with the presence of the responsible person of each department including the Director General of the JUH, where they exchanged opinions on the upper objectives of this plan, the objectives and the results of the Project, as well as collected the information on the health and medical services in Jordan and studied the functions and the present state of JUH, the subject facility of this Project.

As a result, the facts that they could only maintain the ordinary expenditure necessary for the hospital (personnel expenses, drug and material costs, and general expenses) due to insufficient budget and they could not provide the rehabilitation costs of facilities as capital expenditure, the replacement costs of decrepit equipment, and the expenses to supplement the equipment necessary for handling the increasing patients were confirmed as the problems of the facility. In addition, from the standpoint of medical services, the number of patients waiting for the medical services including the operations increased and sufficient services could not be provided when they were needed. Furthermore, the clinical education cannot catch up with the international standard that had been raised with the rapid progress of medical technologies. Thus, it was clarified that the levels of medical services and clinical education had been lowered.

Therefore, considering that the JUH is the tertiary medical facility to the nation of Jordan including the poor and at the same time the top referral facility to provide clinical education to the medical employees, the aptness of this Project can be sufficiently validated as a part of the strengthening plan of the JUH.

Based on the results of the PCM workshop, the basic concept for selecting the equipment in this Project was decided as follows.

- (1) To recover the medical level of JUH as the top referral facility in the health and medical field and the level of clinical education which the JUH has maintained to the one matching to the international standard by replacing the equipment which has been decrepit accompanying the stagnant economy of Jordan, the equipment spare parts of which are difficult to obtain, or the one that needs maintenance cost
- (2) To improve the level of clinical education at JUH to the one conforming to the present international standard, to strengthen the function of JUH as the tertiary facility, and to strengthen the medical services to the nation that cannot receive services from private hospitals by introducing supplemental and new equipment
- (3) As the premises in accordance with the concept mentioned in the above mentioned items (1) and (2), to include in the project the equipment basically required by the departments where the renovation is being conducted in JUH with the self-help efforts.

Surgical Dept.	Operation Theater for Cardiac Surgery
Special Units Dept.	CCU, CCU Recovery, IMCU, Burn Unit, PICU
Physiotherapy Dept.	Physiotherapy Room

2-3 Basic design

2-3-1 Design concept

(1) Protection against natural condition

The weather of Jordan belongs to the Mediterranean climate. It is necessary to pay attention to the dry weather with low humidity, which is one of the characteristics of the Mediterranean climate, but the equipment conforming to the JIS, BS, DIN standards would be sufficient for that climate. Because the time to deliver and install the equipment will be during the rainy season (from January to February), it is necessary to pay enough attention to the delivery of electronic equipment which is vulnerable to water when it rains vigorously.

(2) Concerning the practice at facilities

The mentioned three departments and six rooms in the facilities of this project are under renovation or the construction is almost going to start. The renovation or the construction is scheduled to be completed by January 1998, but as specified in the minutes of the discussion, the progress state must be confirmed by the monthly report. If the renovation is not completed as scheduled, these departments and rooms will be reconsidered from the project.

(3) Concerning the social practice

When implementing this project, loading or transportation of equipment in Jordan may fall on the Ramadan period (from the beginning of December 1998 to the beginning of January 1999). Thus sufficient consideration must be paid to the supervision of the process by discussing with the government of Jordan.

(4) Concerning the local procurement and local representatives

In Jordan, there is no manufacturer of medical equipment including the electronic equipment except for those made from stainless steel such as the beds or the stands for medical equipment. Therefore, as a rule, the equipment to procure must be the one manufactured in Japan as a rule. If the equipment in the project cannot be procured in Japan, it must be procured from the one manufactured in the third country. For the equipment that needs maintenance or supply of consumable parts or reagents after it is procured, priority will be given to the products of the manufacturers that have dealers at site. However because from the results of studying the present state of medical equipment preparation plan implemented under the grant aid of Japan in fiscal year 1994, it was found that local agents were changed because of the reasons of the manufacturer after the equipment was procured, causing troubles in maintenance services and supply of replacement parts. Thus the equipment that needs maintenance must be selected considering the technical level and the achievements of the manufacturer.

(5) Concerning the maintenance ability of implementation agency

By considering the maintenance of the equipment after the project is implemented, daily and regular inspections of the equipment will be explained and instructed to the operators of the equipment when the equipment is delivered and installed. In addition, the technical materials and manuals necessary for maintenance and the list of the manufacturers and dealers to contact will be prepared so that they can be used as the maintenance materials after being procured.

(6) Selecting the equipment and its grade

Because the concept of cooperation for the facilities included in this project is the strengthening of the clinical education, equipment must be selected from the ones that conform to the existing equipment based on the curriculum of the clinical education of each department and the ones that are easy to be maintained by the maintenance department of the JUH as a rule and the maintenance system of which are prepared at the dealer or agent. In addition, from the examination of the existing equipment, the equipment that might affect the patients will be examined including the auto voltage regulator, the uninterruptible power supply, and

the water softener by considering the handling state of voltage fluctuation or power outage using the generator, the water quality and pressure, or other hygienic facility. According to the discussions with and the study of the JUH and dealers, supply of consumables will need about four to six months after they are ordered. Thus six months worth of consumables as well as the amount necessary for the test run and the training must be ordered also.

The inspection tools for maintenance and the spare parts will not be procured in this project from the standpoint of product liability (PL) law.

(7) Concerning the work schedule

As mentioned in the section on social practice, the supervision of works during the Ramadan needs sufficient consideration as well as care must be taken so that the effects of the Ramadan can be minimized such as the interruption of hospital operations because the Ramadan period falls on the time of delivery and installation to the existing facilities.

2-3-2 Basic design

(1) Details of the examination of equipment

The study team discussed the selection of the required equipment with the government of Jordan based on the principle of equipment selection at the time of basic design. The government of Jordan determined the priority of equipment using the alphabet (ABC) during the discussion.

1. Recovery & Anesthesia Unit
2. Radiology Dept.
3. Surgical Dept. Cardiac Surgery, General Surgery
4. OB / GYN Dept.
5. Special Units Dept. ICU-Surgical, PICU, IMCU, GI Unit, Burn Unit
6. Physiotherapy Dept.
7. Internal Medicine Dept. Cardiology
8. Nursing Dept. Ward, CSSD
9. Special Surgery Dept. ENT, Neurosurgery, Ophthalmology, Orthopedics, Urology, Thoracic Surgery
10. Laboratory Dept.

After concluding the minutes of discussion, study and discussions were continued and the detail sub-priority (123) was added to the priority (ABC) on the final list of requested equipment and the necessity and the aptness were examined.

The results of the domestic analyses were indicated and explained to the Jordanian side when this design outline was explained and studied and discussions were held as well as

the equipment which needed reconfirmation was confirmed, then the final equipment plan was agreed.

(2) Method in selection of equipment

A) The confirmed subject in the minutes by both parties for equipment selection is as shown below.

Basic policy for equipment selection

- Replacing or supplementing of the equipment for the clinical education which is necessary for Jordan University Hospital
- Determining the items and quantities attaching importance to appropriateness in medical technique, maintenance, budgetary plan and others
- Designing the project so that it meets the scheme of Japan's Grant

Definition

1. Replacement of equipment

Replacement of equipment, which is used in daily clinical education but aged and in poor condition.

- ex.) over 10 years old equipment
disordered equipment
frequently repaired equipment

2. Supplement of equipment

Supplementing the equipment of which the necessity can be justified by the expansion of the clinical education.

3. Newly-Introduced Equipment

Introducing the equipment, which is essential in the clinical education.

The following conditions should be practically satisfied.

- demand of the clinical education
- technical level
- personnel
- budgetary plan of maintenance, etc.

Examples of equipment to be selected

- Equipment for the clinical education.
- Equipment which is appropriate for technical level of Jordan University Hospital.

- Equipment for which Jordan University Hospital has appropriate budgetary plans for maintenance.

Examples of equipment to be excluded from the Project

- Equipment newly developed, and its reliability, effectiveness and maintenance cost have not been clearly determined.
- Equipment of which maintenance cost is so big that the sustainability would be obstructed.
- Equipment of which consumables, spare parts and maintenance services of manufacturer can not be provided in Jordan.
- Consumables.
- Equipment for departments or room of which renovation plans of Jordan side can not be clearly and practically presented in the basic study phase.
- Equipment which violate the regulation or law of medical disposable and radiographic control.
- Duplication or overlapped equipment (Already existing equipment and so on).

B) Based on the selection concept of the equipment confirmed by both parties in the results of continuous studies with the consultant and the minutes of discussion, the following were determined as the selection conditions of the equipment.

- (1) The equipment used for medical services and clinical education
- (2) The equipment the efficacy of which for medical purposes has been established
- (3) The equipment that can be used by the present staff of JUH
- (4) The equipment the maintenance costs of which can be borne by the budget of JUH
- (5) The equipment having no adverse effect to environment

C) Based on the above mentioned conditions, the domestic analysis was conducted in accordance with the following steps to examine whether the equipment was apt for procurement.

Step 1 Analysis of each equipment

The equipment falling under the following items are deleted. The items to which an "x" is attached in Step 1 are deleted from this project and those items that are not deleted by the said analysis proceed to the succeeding Step and analyzed again.

- a. Equipment needs the construction of facility.
- b. Function of the equipment is incorporated into other equipment.

- c. Equipment can be considered to be purchased by the budget of the hospital.
- d. Deletion of the equipment is agreed by the recipient country.
- e. Equipment can be shared or overlapped.

Step 2 Definition and analysis

The requested equipment is classified into replacement, supplement, and newly added ones by comparing with the existing equipment. The newly added equipment is divided into two types of marks into the one owned by other department of the JUH and the one that is not owned by the hospital and to be added newly.

Replacement equipment.

The year, the state, and the amount of the existing equipment and the contents of request were compared and a conclusion was made.

Supplement equipment.

The amount of the existing equipment and the aptness requiring the supplement were analyzed.

Newly added equipment.

The aptness of the requested equipment was analyzed.

Step 3 Comparison of the budget and the priority of JUH

As the final step, comparison will be made on the priority and the budget in the departments so that the necessity and the aptness could be verified based on the results obtained so far, and the final departments will be determined. Then the necessary equipment will be analyzed and the list will be formulated based on the results of analysis.

The above mentioned details of equipment selection are shown in Table 2-1 according to the preparation procedure of equipment plan explained below.

Table2 - 1 Details of equipment selection

Step 1: a - Equipment needs the facility construction, b - Function of the equipment is incorporated into other requested equipment, c - Equipment can be purchased by the hospital, d - Deletion of the equipment is agreed by each department, e - Equipment can be shared or overlapped Step 2: "*" - newly-introduced equipment that is not existing in IUH OM (Operation & Maintenance) cost: The equipment to which an asterisk (*) is attached is the main equipment requiring maintenance costs.

Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 2		Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e	Replace- ment	Newly Supple- ment					
				Result	Result	Result	Result	Result							
Anesthesiology	ICU - Surgical	1 Bed	3-Crank Couch Bedside, with Invasive BP											renewal for eight (15-years-existing)	
Anesthesiology	ICU - Surgical	2 Monitor	Bedside											renewal for four (12-years-existing)	
Anesthesiology	ICU - Surgical	3 Monitor	Bedside											renewal for three (12-years-existing)	
Anesthesiology	ICU - Surgical	4 ECG	3 Channel						*					renewal for one (12-years-existing)	
Anesthesiology	ICU - Surgical	5 Syringe Pump							*					renewal for one (9-years-existing) and supplement of fourteen, 2 pumps per each bed	
Anesthesiology	ICU - Surgical	6 Laryngoscope				X								deleted (Ventilator has a same function)	
Anesthesiology	ICU - Surgical	7 CPAP System		X										Supplement of one. One existing item is good	*
Anesthesiology	ICU - Surgical	8 Defibrillator	with Trolley and Inner Puddle						*					renewal for two (more-10-years-existing)	
Anesthesiology	ICU - Surgical	9 Doppler	Portable						*					Supplement of six. Ten existing items are good, 2 pumps per each bed for 8 beds	
Anesthesiology	ICU - Surgical	10 Infusion Pump							*					Supplement of two. Two existing items are good	
Anesthesiology	ICU - Surgical	11 Mattress	Heat, Adult / Child											included in Bedside monitor, there are 4 existing.	
Anesthesiology	ICU - Surgical	12 Pulse Oximeter		X										renewal for four (more-10-years-existing)	
Anesthesiology	ICU - Surgical	13 Ventilator	Adult						*						
Anesthesiology	ICU - Surgical	14 Weighing Scale			X										
Anesthesiology	ICU - Surgical	15 Ambu bag			X										
Anesthesiology	ICU - Surgical	16 Trolley			X										
Anesthesiology	ICU - Surgical	17 Calorimetric Machine					X								
Anesthesiology	ICU - Surgical	18 Infusion Warmer							*					Selected for Cardiac surgery and cardiac laboratory, share with CCU	*
Anesthesiology	ICU - Surgical	19 Cardiac Output Machine	Thermodilution Type							*				renewal for one (11-years-existing)	*
Anesthesiology	ICU - Surgical	20 Blood Gas Analyzer							*						
Anesthesiology	ICU - Surgical	21 Bronchoscope	Fiber		X										
Anesthesiology	ICU - Surgical	22 Ice Machine			X										
Anesthesiology	ICU - Surgical	23 Pacemaker	Transmembranous				X								
Anesthesiology	ICU - Surgical	24 Spot Light							*						
Anesthesiology	ICU - Surgical	25 Suction pump	Portable						*					Supplement of two. Quantity of existing is not enough	
Anesthesiology	Operation Theater	26 Blood Warmer	Dry Type						*					renewal for seven (10-years-existing)	
Anesthesiology	Operation Theater	27 Laryngoscope	Fiber-optic						*					renewal for one (9-years-existing)	
Anesthesiology	Operation Theater	28 Tourniquet	Double Cuff						*					Selected as basic item for hemostasis	

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Results	Final Qty	Note	OM cost
				a	b	c	d	e		Replacement	Newly Suppliment						
Anesthesiology	Operation Theater	29	Apnea Alarm						X			X					
Anesthesiology	Operation Theater	30	Monitor							☆		○		4	renewal for four (6-years-existing)		
Anesthesiology	Operation Theater	31	Relaxograph							☆		○			discontinued		
Anesthesiology	Operation Theater	32	Anesthesia Machine with Ventilator, Adult / Pediatric							☆		○		3	renewal for four (more-10-years-existing)		
Anesthesiology	Operation Theater	33	Blood Salvage Machine							☆		○			deleted by newly-introduced equipment		
Anesthesiology	Operation Theater	34	Nerve Stimulator with Syringe							☆		○		5	Selected as basic item for control of anesthesia		
Anesthesiology	Operation Theater	35	Gas analyzer					X				X					
Anesthesiology	Operation Theater	36	Intubating Stylet					X				X					
Anesthesiology	Operation Theater	37	Stethoscope									X					
Anesthesiology	Operation Theater	38	Nerve Stimulator									X					
Anesthesiology	Operation Theater	39	Vaporizer					X				X					
Anesthesiology	Operation Theater	40	Vaporizer					X				X					
Anesthesiology	Operation Theater	41	Evoked potential Machine for Auditory									X					
Anesthesiology	Operation Theater	42	Suiciding System						X			X					
Burn Unit	B-Operation Theater	43	Anesthesia Machine with Ventilator, Adult / Pediatric							☆		○		1	renewal for one (15-years-existing)		
Burn Unit	B-Operation Theater	44	Hand Washing Unit							☆		○		1	renewal for one (20-years-existing.) see Chapter1		
Burn Unit	B-Operation Theater	45	Monitor							☆		○		1	Supplement of one for extension of burn unit *		
Burn Unit	B-Operation Theater	46	Dialtherapy Machine							☆		○		1	renewal for one (10-years-existing)		
Burn Unit	B-Operation Theater	47	Ventilator					X				X					
Burn Unit	B-Operation Theater	48	Dermatome							☆		○		1	Supplement of one. One existing item is good		
Burn Unit	B-Operation Theater	49	Measer, Skin Graft							☆		○		1	Supplement of one. One existing item is good		
Burn Unit	B-Operation Theater	50	Mattress									○		1	Selected as basic item for control of patient's temperature		
Burn Unit	B-Operation Theater	51	Blood Warmer				X					X					
Burn Unit	B-Ward	52	Bed							☆		○		8	renewal for eight (more-10-years-existing)		
Burn Unit	B-Ward	53	Doppler							☆		○		1	renewal for one (10-years-existing)		
Burn Unit	B-Ward	54	ECG							☆		○		1	renewal for one (10-years-existing)		

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2			Step 2 Result	Step 3 Final analysis	Final Result	Final QTY	Note	OM cost
				a	b	c	d	e		Replacement	Supplement	Newly						
Bum Unit	B-Ward	55	Trolley			X			X				X					
Bum Unit	B-Ward	56	Ventilator						O	*	*		O			2	renewal for one (10-years-existing) and supplement of one, 2 items for 8 beds	*
Bum Unit	B-Ward	57	Matress, Pressure Sore						O		*		O			2	Selected as basic item for prevention of infection	
Bum Unit	B-Ward	58	Monitor					X	X			X					share with Bedside monitor	
Bum Unit	B-Ward	59	Pulse Oximeter		X				X			X					included in Bedside monitor	
Bum Unit	B-Ward	60	Monitor						O	*	*		O			4	Selected as basic item for intensive care.	*
Bum Unit	B-Ward	61	Lamp, Heat				X		X			X						
Bum Unit	B-Ward	62	Bed Head Unit		X				X			X						
Bum Unit	Hydrotherapy	63	Therapy Tank with Massage						O	*	*		O			1	renewal for one (15-years-existing)	
Bum Unit	Hydrotherapy	64	Showering System						O	*	*		O			1	renewal for one (15-years-existing)	
Bum Unit	Hydrotherapy	65	Scale				X		X			X						
Bum Unit	Hydrotherapy	66	Trolley						O		*		O			1	Selected as basic item for carriage of patient	
Bum Unit	Hydrotherapy	67	Lifter		X				X			X					included in Showering system	
Bum Unit	Hydrotherapy	68	Bed						O		*		O			6	selected for new room	
Cardiac Surgery	CCU Recovery	69	Defibrillator						O		*		O			2	selected for new room	*
Cardiac Surgery	CCU Recovery	69	Defibrillator with Trolley						O		*		O			9	selected for new room	
Cardiac Surgery	CCU Recovery	70	Infusion Pump						O		*		O			6	selected for new room	*
Cardiac Surgery	CCU Recovery	71	Monitor						O		*		O			1	selected for new room	*
Cardiac Surgery	CCU Recovery	72	ECG						O		*		O			1	included in other items (Bedside monitor)	*
Cardiac Surgery	CCU Recovery	73	Pulse Oximeter		X				X			X					share with CCU	
Cardiac Surgery	CCU Recovery	74	Ventilator						O	*	*		O			1	renewal for one (17-years-existing)	*
Cardiac Surgery	Operation Theater	75	Heart Lung Machine						O		*		O			1	selected as beginning of open heart surgery	*
Cardiac Surgery	Operation Theater	76	Defibrillator with Trolley and Iner Peddle						O		*		O			3	selected as beginning of open heart surgery	
Cardiac Surgery	Operation Theater	77	Infusion Pump						O		*		O			1	selected as beginning of open heart surgery	
Cardiac Surgery	Operation Theater	78	Matress						O		*		O			2	selected as beginning of open heart surgery	
Cardiac Surgery	Operation Theater	79	Pacemaker						O		*		O			4	selected as beginning of open heart surgery	
Cardiac Surgery	Operation Theater	80	Syringe Pump						O		*		O			2	selected as beginning of open heart surgery	
Cardiac Surgery	Operation Theater	81	Headlight						O		*		O			2	selected as beginning of open heart surgery	
Cardiology	CCU	82	Defibrillator with Trolley						O	*	*		O			2	renewal for two (10-years-existing)	
Cardiology	CCU	83	Monitor						O	*	*		O			8	renewal for eight (15-years-existing)	

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2 Replacement	Step 2 Supplyment	Step 2 Newly	Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e										
Cardiology	CCU	84	Monitor							☆		○		○	1	renewal for one (15-years-existing)		
Cardiology	CCU	85	ECG							☆		○		○	2	renewal for two (10-years-existing)		
Cardiology	CCU	86	Infusion Pump							☆		○		○	11	renewal for three (15-years-existing) and supplement for eight, supported 2 pumps per each bed		
Cardiology	CCU	87	Bed							☆		○		○	8	renewal for eight (15-years-existing)		
Cardiology	CCU	88	Monitor								☆	○		○	1	selected as basic item for transportation of seriously injured patient	*	
Cardiology	CCU	89	Pulse Oximeter		X							X		X	-	included in Transport cardiac monitor		
Cardiology	CCU	90	Ultrasound Machine									○		○	1	selected as essential equipment for cardiac disease	*	
Cardiology	CCU	91	Ventilator							☆		○		○	3	renewal for four (more-10-years-existing)		
CSSD	CSSD	92	Steam Sterilizer							☆		○		○	2	renewal for two (more-25-year-existing)		
CSSD	CSSD	93	Ethylene Oxide Sterilizer					X				X		X	-	use existing		
CSSD	PICU	94	Nipple Sterilizer Machine					X				X		X	-			
ENT	Audiology Unit	95	Evoked Potential Machine							☆		○		○	1	renewal for one (12-years-existing)		
ENT	Audiology Unit	96	Vestibular System Testing Unit							☆		○		X	-			
ENT	Audiology Unit	97	Calibration Instruments Set for Audiometer								☆	X		X	-	deleted by newly-introduced equipment		
ENT	Audiology Unit	98	Hearing Aid Laboratory								☆	X		X	-	deleted by newly-introduced equipment		
ENT	Audiology Unit	99	Oroacoustic Emission Recording Set								☆	X		X	-	deleted by newly-introduced equipment		
ENT	Audiology Unit	100	Anesthesia Machine					X				X		X	-	share with Anesthesiology Dept.		
ENT	Audiology Unit	101	Audiometer							☆		○		○	1	renewal for one (12-years-existing)		
ENT	ENT Examination	102	Examination Unit for ENT with Headlight							☆		○		○	3	renewal for three (more-12-years-existing)		
ENT	ENT Examination	103	Headlight							☆		○		○	4	renewal for four (15-years-existing)		
ENT	ENT OPD	104	Fiber-optic Scope for Laryngeal, Treatment;							☆		○		○	1	renewal for one (17-years-existing)		
ENT	ENT OPD	105	Fiber-optic Scope for Laryngeal, Adult							☆		○		○	1	renewal for one (17-years-existing)		
ENT	ENT OPD	106	Light Source		X							X		X	-	included in set of Fiber-optic scope		
ENT	ENT OPD	107	Fiber-optic Scope for Laryngeal, Pediatrics		X							X		X	-	included in set of Fiber-optic scope		
ENT	Operation Theater	108	Endoscopic Sinus Surgery Set							☆		○		○	1	renewal for one (more-10-year-existing)		
ENT	Temporal Bone Lab.	109	Burs					X				X		X	-			
ENT	Temporal Bone Lab.	110	Cabinet					X				X		X	-			

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e		Replacement	Newly						
ENT	Temporal Bone Lab.	111	Drill Handles							☆	○	×	-	-	-	-	
ENT	Temporal Bone Lab.	112	Drills							☆	○	×	-	-	-	-	
ENT	Temporal Bone Lab.	113	Operating Microscope							☆	○	×	-	-	-	-	
ENT	Temporal Bone Lab.	114	Operating Stools			×				-	×	-	-	-	-	-	
ENT	Temporal Bone Lab.	115	Suction pump							☆	○	×	-	-	-	-	
ENT	Temporal Bone Lab.	116	Suction Tube		×	×				-	×	-	-	-	-	-	
Gastroenterology	Operation Theater	117	Endoscopy System							*	×	-	-	-	-	-	
General Surgery	Operation Theater	118	Operating Table							☆	○	○	○	3	deleted by newly-introduced equipment renewal for three (12-years-existing)		
General Surgery	Operation Theater	119	Suction pump							☆	○	○	○	4	renewal for four (more-10-years-existing)		
General Surgery	Operation Theater	120	Autoclave							☆	○	○	○	3	renewal for three (12-years-existing)		
General Surgery	Operation Theater	121	Bowel Stand			×				-	×	-	-	-	-	-	
General Surgery	Operation Theater	122	Fumigator							☆	○	○	○	2	renewal for one (more-10-years-existing) and supplement for one		
General Surgery	Operation Theater	123	Hand Washing Unit		×					-	×	-	-	-	-	-	
General Surgery	Operation Theater	124	Instrument Table			×				-	×	-	-	-	-	-	
General Surgery	Operation Theater	125	Mayo Instrument Stand			×				-	×	-	-	-	-	-	
General Surgery	Operation Theater	126	Solution Warmer							☆	○	○	○	3	renewal for three (13-years-existing)		
General Surgery	Operation Theater	127	Stretcher Trolley							☆	○	○	○	4	renewal for four (12-years-existing)		
General Surgery	Operation Theater	128	Electrosurgical Unit							☆	○	○	○	3	renewal for three (20-years-existing)		
General Surgery	Operation Theater	129	Swivel Chair			×				-	×	-	-	-	-	-	
General Surgery	Operation Theater	130	Operating Light							☆	○	○	○	2	renewal for one (more 10-years-existing) and supplement of one		
General Surgery	Operation Theater	131	Kick Bucket			×				-	×	-	-	-	-	-	
General Surgery	Operation Theater	132	Hot Air Oven							-	×	-	-	-	-	-	
Internal Medicine	IMCU	133	Bed							☆	○	○	○	8	use existing selected for new room		
Internal Medicine	IMCU	134	Defibrillator							☆	○	○	○	1	selected for new room		
Internal Medicine	IMCU	135	ECG							☆	○	○	○	1	selected for new room		
Internal Medicine	IMCU	136	Infusion Pump							☆	○	○	○	8	selected for new room		
Internal Medicine	IMCU	137	Monitor							☆	○	○	○	4	selected for new room		
Internal Medicine	IMCU	138	Monitor							☆	○	○	○	1	selected for new room		

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2 Replace-ment	Step 2 Supple-ment	Step 2 Newly	Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e										
Internal Medicine	IMCU	139	Monitor					X				X		X		share with CCU		
Internal Medicine	IMCU	140	Pulse Oximeter								*				1	selected for new room		
Laboratory	Clinical Lab.	141	Centrifuge			X		X				X		X				
Laboratory	Clinical Lab.	142	Centrifuge			X		X				X		X				
Laboratory	Clinical Lab.	143	Centrifuge, Refrigerated			X		X				X		X				
Laboratory	Clinical Lab.	144	Centrifuge, Refrigerated						*						2	renewal for two (20-years-existing)		
Laboratory	Clinical Lab.	145	Coagulometer						*						2	renewal for two (12-years-existing)		
Laboratory	Clinical Lab.	146	Gamma Counter						*						1	renewal for one (14-years-existing)		
Laboratory	Electron Microscope	147	Electron Microscope								*	X		X		deleted by the introduction of new technique		
Laboratory	Electron Microscope	148	Knife Making Machine								*	X		X		deleted by the introduction of new technique		
Laboratory	Electron Microscope	149	Ultra-Microtome								*	X		X		deleted by the introduction of new technique		
Laboratory	Inborn Errors of Metabolism	150	Atomic Absorption Spectrophotometer								*	X		X		deleted by the introduction of new technique		
Laboratory	Inborn Errors of Metabolism	151	Electrophoresis System								*	X		X		deleted by the introduction of new technique		
Laboratory	Inborn Errors of Metabolism	152	Gas Chromatography								*	X		X		deleted by the introduction of new technique		
Laboratory	Metabolism	153	HPLC								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	154	Genetic Work Station								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	155	Dry Heat Block								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	156	Electrophoresis System								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	157	Gel Documentation System								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	158	Lamina Flow								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	159	Luminescence System								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	160	Photography Equipment								*	X		X		deleted by the introduction of new technique		
Laboratory	Molecular Biology	161	Sequencer								*	X		X		deleted by the introduction of new technique		

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			a	b	c	d	e		Replacement	Supply ment	Newly						
Laboratory	162	Thermal Cycler										X				deleted by the introduction of new technique	
Laboratory	163	Cell Harvester			X		X					X					
Laboratory	164	CO2 Incubator			X		X					X					
Laboratory	165	Freezer			X		X					X					
Laboratory	166	Lamina Flow			X		X					X					
Laboratory	167	Safety Cabinet			X		X					X					
Neurosurgery	168	Ultrasound Machine															
		for Intraoperative Use															
Nursing	169	Defibrillator with Trolley															
Nursing	170	Stretcher Trolley															
Nursing	171	ECC															
Nursing	172	Doppler															
Nursing	173	Infusion Pump															
Nursing	174	Defibrillator with Trolley															
Nursing	175	ECC															
Nursing	176	Doppler															
Nursing	177	Infusion Pump															
Nursing	178	Suction pump															
Nursing	179	Defibrillator with Trolley															
Nursing	180	ECC															
Nursing	181	Infusion Pump															
Nursing	182	Defibrillator with Trolley															
Nursing	183	ECC															
Nursing	184	Suction pump															
Nursing	185	Doppler															

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Requested Dep.	Room No.	Items	Step 1 (Reason of deletion)				Step 1 Result	Step 2			Step 2 Result	Step 3 Final analysis	Final Qty	Final Result	Note	OM cost		
			a	b	c	d		e	Replace ment	Supple ment							Newly	
Nursing	Ward-Pediatric(8/7)	186 Infusion Pump													renewal for three (more-10-years-existing) and supplement for three			
Nursing	Ward-Surgical(4/3/2)	187 Defibrillator with Trolley													renewal for one (more-10-years-existing)			
Nursing	Ward-Surgical(4/3/2)	188 ECG													renewal for one (10-years-existing) and supplement for one. 1 set per each floor	*		
Nursing	Ward-Surgical(4/3/2)	189 Doppler													selected as basic item for ward			
Nursing	Ward-Surgical(4/3/2)	190 Infusion Pump													supplement of six, three existing items are good, three items per each floor (3 floors)			
Nursing	Ward-Surgical(4/3/2)	191 Suction pump																
Nursing	Wards	192 Bed				X												
OB/GYN	Delivery Room	193 Monitor System, Fetal Satlon														renewal for (more-20-years-existing), each 2 beds per floor		
OB/GYN	Delivery Room	194 Operating Light with Satellite Light														renewal for one, consisting of one central monitor and 8 bedside monitors.	*	
OB/GYN	Delivery Room	195 Ultrasound Machine														renewal for four (15-years-existing)		
OB/GYN	Inferility Lab.	196 Ultrasound Machine with Vaginal Probe														share with inferility lab.		
OB/GYN	Inferility Lab.	197 Autoclave														for analyze and diagnose of Inferility, renewal for one (15-years-existing)		
OB/GYN	Inferility Lab.	198 Balance														for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	199 Camera and Video Microscope														deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	200 Centrifuge														for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	201 CO2 Analyzer														for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	202 CO2 Incubator														deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	203 CO2 Incubator														deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	204 Containers for Straws														deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	205 Dish Washer																
OB/GYN	Inferility Lab.	206 Dry Oven															for analyze and diagnose of Inferility.	
OB/GYN	Inferility Lab.	207 Filtering Unit															deleted by the equipment for IVF treatment	
OB/GYN	Inferility Lab.	208 Freezer															deleted by the equipment for IVF treatment	
OB/GYN	Inferility Lab.	209 Lamina Flow															deleted by the equipment for IVF treatment	
OB/GYN	Inferility Lab.	210 Magnetic Steril Recorder															deleted by the equipment for IVF treatment	
OB/GYN	Inferility Lab.	211 Microforge															deleted by the equipment for IVF treatment	

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e		Replace-ment	Supplie-ment						
OB/GYN	Inferility Lab.	212	Micromanipulation Equipment								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	213	Microscope Dissection, Stereo Zoom.								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	214	Microscope Inverted								*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	215	Microscope Research								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	216	Mixer Vortex			X					*		X	-	-		
OB/GYN	Inferility Lab.	217	Monitor to Dissection Microscope	X							*		X	-	included in other items (Camera and video)		
OB/GYN	Inferility Lab.	218	Oscrometer								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	219	PH Merer								*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	220	Sperm Counting Chambers								*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	221	Store Cans Cryo			X					*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	222	Table with Sinks, S.S.	X							*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	223	LN2 Tank for Sample								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	224	Thermos Container Cryo			X					*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	225	Tube Rocks Bench-Top								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	226	Ultrasonic Cleaner								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	227	Video Recorder				X				*		X	-	deleted by overlapping		
OB/GYN	Inferility Lab.	228	Water Bath 56C								*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	229	Water Purification System								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	230	Aspiration Unit								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	231	Examination Couch			X					*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	232	Examination Lamp								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	233	Monitor to Ultrasound			X					*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	234	Table, Examination for OB / GYN								*			1	for analyze and diagnose of Inferility.		
OB/GYN	Inferility Lab.	235	Tabourts Adjustable Heights			X					*		X	-	-		
OB/GYN	Inferility Lab.	236	Video Equipment for Ultrasound Machine			X					*		X	-	including in Ultrasound Machine		
OB/GYN	Inferility Lab.	237	Warming Table Plate Warming Block								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	238	Gas Manifold for 5% CO2 Gas Mixture								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	239	Pipette Puller								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	240	Pipette Grinder								*		X	-	deleted by the equipment for IVF treatment		
OB/GYN	Inferility Lab.	241	LN2 Tank for LN2 Storage								*		X	-	deleted by the equipment for IVF treatment		
Ophthalmology	Operation Theater	242	Surgical Instruments for Ophthalmology								*			1	renewal for one (more-10-years-extending)		

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e		Replacement	Newly						
Ophthalmology	Operation Theater	243	Surgical Microscope with Video							☆		○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	244	Vitreotomy Machine							☆		○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	245	Laser System								☆	○	○	○	1	renewal for one (more-10-years-existing)	*
Ophthalmology	Operation Theater	246	Keratome								☆	○	○	○	1	renewal for one (more-10-years-existing)	*
Ophthalmology	Operation Theater	247	Excimer Laser								☆	○	○	○	1	renewal for one (more-10-years-existing)	*
Ophthalmology	Operation Theater	247	Lasik								☆	○	○	○	1	renewal for one (more-10-years-existing)	*
Ophthalmology	Operation Theater	248	Examination Unit for Ophthalmology								☆	○	○	○	2	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	249	Automatic Refractometer								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	250	Microscope								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	251	Perimeter								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	252	Electro Oculogram (EOG), Electroretinogram(ERG), Evoked Potential Machine(VEP)								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	253	Binocular Indirect Ophthalmoscope								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	254	Minipoint Illumination System								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Ophthalmology	Operation Theater	255	Stereoscopic Diagonal Inverter								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Laboratory	256	Bone Bank System								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	257	Control Dubuase Horizon System for Spinal Surgery								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	258	Electrosurgical Unit								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	259	Micro-Endoscopic System								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	260	Pneumatic Osteotome System with Drills and Saws for Intraoperative Use								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	261	Evoked Potential Machine for Spinal Surgery, Yag								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	262	Image-Guided Surgery System								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	263	Image-Guided Surgery System for Pediatric Orthopedics								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Orthopedics	Operation Theater	264	Ultrasound System for Pediatric Orthopedics								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Pediatrics	X-ray	265	Bone Densitometry								☆	○	○	○	8	renewal for one (more-10-years-existing)	
Pediatrics	PICU	266	Bed								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Pediatrics	PICU	267	Blood Gas Analyzer								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Pediatrics	PICU	268	Defibrillator								☆	○	○	○	1	renewal for one (more-10-years-existing)	
Pediatrics	PICU	269	ECC								☆	○	○	○	1	renewal for one (more-10-years-existing)	

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2 Replacement	Step 2 Supplyment	Step 2 Newly	Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e										
Pediatrics	PICU	270	Fiber-optic Light			X			X			X		X				
Pediatrics	PICU	271	Incubator / Transport for Neonates					X			*	O		O	1	selected as division from ICU	*	
Pediatrics	PICU	272	Incubator for Neonates					X				X		X		share with NJCU and PICU Dept.		
Pediatrics	PICU	273	Infusion Pump								*	O		O	8	selected as division from ICU	*	
Pediatrics	PICU	274	Monitor								*	O		O	4	selected as division from ICU		
Pediatrics	PICU	275	Pulse Oximeter								*	O		O	4	selected as division from ICU		
Pediatrics	PICU	276	Ventilator								*	O		O	1	selected as division from ICU		
Pediatrics	PICU	277	Ventilator								*	O		O	2	selected as division from ICU	*	
Pediatrics	PICU	278	Ventilator; Transport								*	O		O	1	selected as division from ICU	*	
Pediatrics	PICU	279	Ultrasound Machine					X				X		X		share with Radiology Dept.		
Pediatrics	PICU	280	Refrigerator with Freezer			X			X			X		X				
Pediatrics	PICU	281	Resuscitation Bag			X			X			X		X				
Pediatrics	PICU	282	Infant Warmer for Resuscitation					X			*	O		O	2	selected as division from ICU		
Pediatrics	PICU	283	Glucometer with Sticks			X			X			X		X				
Pediatrics	PICU	284	Overhead Warmer			X			X			X		X				
Pediatrics	PICU	285	Trans Cutaneous PO2 and PCO2 Monitoring			X			X			X		X				
Physiotherapy	Hydrotherapy	286	Butterfly Bath								*	O		O	1	supplement of one as division to male room and female room		
Physiotherapy	Hydrotherapy	287	Massage Bath								*	O		O	1	supplement of one as division to male room and female room		
Physiotherapy	Hydrotherapy	288	Four Compartment Bath					X				X		X				
Physiotherapy	Hydrotherapy	289	Jet Sprayer								*	O		O	1	supplement of one as division to male room and female room		
Physiotherapy	Hydrotherapy	290	Balancer and Patient Carrier	X					X			X		X				
Physiotherapy	Hydrotherapy	291	Combination Bath					X				X		X		share with Massage bath		
Physiotherapy	Hydrotherapy	292	Dry Hydrotherapy Machine								*	X		X		deleted by the introduction of new technique		
Physiotherapy	Physiotherapy	293	Exercise Table				X		X			X		X				
Physiotherapy	Physiotherapy	294	Isokinetic Machine for Extremities				X		X			X		X		overlapped with other item		
Physiotherapy	Physiotherapy	295	Treadmill				X		X			X		X		use existing		
Physiotherapy	Physiotherapy	296	Parallel Bars							*		O		O	1	renewal for one (10-years-existing)		
Physiotherapy	Physiotherapy	297	Quadriceps Bench							*		O		O	1	renewal for one (25-years-existing)		
Physiotherapy	Physiotherapy	298	Training Equipment for Full Fitness Program				X		X			X		X				
Physiotherapy	Physiotherapy	299	Combination Therapy				X		X			X		X		overlapped with other item		
Physiotherapy	Physiotherapy		Natural Heat				X		X			X		X				

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e		Replacement	Supplement						
Physiotherapy		300	Cooler Unit with Cold Pack							*							renewal for one (more-10-years-existing)
Physiotherapy		301	Treatment Couch			X				*							renewal for one (8-years-existing)
Physiotherapy		302	Intermittent Compression Unit Portable				X			*							deleted by low priority (C)
Physiotherapy		303	Short-wave Unit							*							renewal for seven (8-years-existing)
Physiotherapy		304	Transcutaneous Electrical Nerve Stimulator (TENS)					X		*							overlapped with other item
Physiotherapy		305	Stimulator Portable							*							renewal for one (8-years-existing)
Physiotherapy		306	Upper Limb Exercise Machine							*							renewal for one (20-years-existing)
Physiotherapy		307	Pulley System							*							deleted by low priority (C)
Physiotherapy		308	Exgonometers			X				*							renewal for one (8-years-existing)
Physiotherapy		309	Stimulator Multichannel							*							supplement of one as division to male room and female room
Physiotherapy		310	Vacuum Unit			X				*							supplement of one as division to male room and female room
Physiotherapy		311	Trolley							*							supplement of one as division to male room and female room
Physiotherapy		312	Ultrasound Therapy Portable							*							supplement of one as division to male room and female room
Physiotherapy		313	Interferential Unit Portable							*							supplement of one as division to male room and female room
Physiotherapy		314	Electrotherapy Unit Portable							*							supplement of one as division to male room and female room
Physiotherapy		315	Combination Unit Ultrasound & Electrotherapy							*							supplement of one as division to male room and female room
Physiotherapy		316	Biofeedback Unit			X				*							deleted by low priority (C)
Physiotherapy		317	Ultrasound Therapy			X				*							deleted by low priority (C)
Physiotherapy		318	Infra-Red Laser Unit			X				*							deleted by low priority (C)
Physiotherapy		319	Interferential Unit			X				*							deleted by low priority (C)
Physiotherapy		320	Microwave Unit			X				*							deleted by the introduction of new technique
Physiotherapy		321	Air Splints for Amputee							*							deleted by the introduction of new technique
Physiotherapy		322	Isokinetic Back Machine							*							deleted by the introduction of new technique
Physiotherapy		323	Force Platform and EMG for an Existing Gait Analysis System							*							deleted by the introduction of new technique
Physiotherapy		324	Work-Set Station Computerized							*							deleted by the introduction of new technique
Physiotherapy		325	Magnetic Therapy							*							deleted by the introduction of new technique
Physiotherapy		326	Intermittent Compression Unit					X		*							overlapped with other item

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Requested Dep.	Room	No.	Items	Step 1 (Reason of deletion)					Step 1 Result	Step 2		Step 2 Result	Step 3 Final analysis	Final Result	Final Qty	Note	OM cost
				a	b	c	d	e		Replace-ment	Supple-ment						
Radiology	Echography	327	Ultrasound Machine							☆		○	○	○	1	renewal for one (more-10-years-existing), share with Orthopedics Dept., PICU and Urology Dept.	
Radiology	Nuclear Medicine	328	Gamma Camera							☆		○	○	○	-	deleted by high technical and costly item	
Radiology	X-ray	329	Angiography							☆		○	○	○	-	deleted by high technical and costly item	
Radiology	X-ray	330	CT Scanner							☆		○	○	○	1	renewal for one (10-years-existing)	
Radiology	X-ray	331	X-ray Machine, Fluoroscopy					X		-		○	○	○	-	overlapped with the World Bank donation	
Radiology	X-ray	332	X-ray Machine, General							☆		○	○	○	1	renewal for one (10-years-existing)	
Radiology	X-ray	333	X-ray Machine, IVP							☆		○	○	○	1	see Chapter 1	
Radiology	X-ray	334	X-ray Machine, Mammogram							☆		○	○	○	1	renewal for one (10-years-existing)	
Radiology	X-ray	335	Film Developer							☆		○	○	○	3	renewal for three (12-years-existing)	
Radiology	X-ray	336	X-ray Machine, Mobile							☆		○	○	○	4	renewal for five (10-years-existing)	
Radiology	X-ray	337	Film Developer					X		-		○	○	○	-	deleted by acceptance of darkroom type	
Thoracic Surgery	Operation Theater	338	Video Bronchoscope Set							☆		○	○	○	1	renewal for one (12-years-existing)	
Thoracic Surgery	Operation Theater	339	Video Thoracoscopy Set							☆		○	○	○	-	deleted by newly-introduced equipment	*
Thoracic Surgery	Operation Theater	340	Laser System					X		-		○	○	○	-	share with Orthopedics	*
Thoracic Surgery	Operation Theater	341	Video Mediastinoscopy System							☆		○	○	○	-	deleted by the introduction of new technique	
Urology	Urology-OPD	342	Urodynamics System							☆		○	○	○	1	renewal for one (25-years-existing)	
Urology	Urology-OPD	343	Endoscopic set, Urologic							☆		○	○	○	1	selected by used at operation theater	
Urology	Urology-OPD	344	Ultrasound Machine					X		-		○	○	○	-	share with Radiology	

(2) Equipment plan

From Table 1-1, the aptness will be verified on 170 items among the total of initially requested 344 items according to the analysis of the above mentioned examination table.

Equipment to be replaced	: 93 items
Equipment to be supplemented	: 21 items
Equipment to be newly added (existing in the hospital)	: 52 items
Equipment to be newly added (not existing in the hospital)	: 4 items

The contents of the equipment plan for each department are as follows.

Anesthesiology

1. ICU-Surgical

Among the twenty-five (25) requested items, thirteen (13) items are determined apt for procurement. The items essential for the intensive care unit (ICU) and those having been used for more than ten years (ICU Bed, Bedside monitor, ECG, Blood flow meter.) The number of the operations conducted last year was 10,200 and that of the patients hospitalized at the anesthesiology department was 590 in a year. The details of twelve (12) deleted equipment that were deleted from the reasons mentioned in Steps 1, most of which are determined to be able to be purchased by the JUH and function of the equipment is incorporated into other equipment.

2. Operation theater

Among the seventeen (17) requested items, six (6) items are determined apt for procurement. The number of operations conducted last year was 10,200 in which the number of operations conducted at general surgery, ophthalmology, orthopedic surgery, obstetrics and gynecology departments accounts for approximately 70%. The items having been used for more than ten years and need replacement are determined to be procured including part of the existing equipment having been there for more than six years and often causing trouble such as the anesthesia machine managed by the above mentioned department, blood warmer, and nerve stimulator. Among the deleted eleven (11) items, main items include the one whose function can be incorporated to other equipment to be procured such as the vaporizer, or the scavenging system that needs the construction work exceeding the range of normal installation work, or the newly added equipment.

Burn unit

1. Burn unit / operation theater

Among the requested nine (9) items, seven (7) items are determined apt for

procurement. The number of the patients treated there last year was about sixty (60) and the average duration of hospitalization was relatively long of 24.2 days. The number of the cases treated with skin washing exceeded 900 a year. About 60% of the patients hospitalized in these department are sixteen years old or under. Considering the facts that the treatment of burn must eliminate miscellaneous germs as a rule, sharing of equipment with other departments is difficult, and the equipment must be kept independently at the burn unit, the replacement items (anesthesia machine and hand washing unit) and the supplement items accompanying the expansion of the department (Dermatome and skin graft) are determined to be procured. The deleted two (2) items are the ventilator that can be incorporated into the anesthesia machine to be procured and the blood warmer that can be purchased by the hospital budget.

2. Burn unit / ward

Among the eleven (11) requested items, six(6) items are determined to be procured. As mentioned in the previous section, the burn ward also functions as the ICU due to its characteristics, the monitor and the ventilator are determined to be procured and those need replacement are mainly included in the procurement plan. The deleted five (5) items are those that can be incorporated to the equipment to be procured and those that can be purchased by the hospital budget.

3. Burn unit / hydrotherapy

Among the five (5) requested items, three (3) items are determined to be procured. The items to be procured include the therapy tank most necessary for the hydrotherapy of burn and the shower system. The deleted two (2) items are the lift that can be incorporated into the equipment to be procured and the scale that can be purchased by the hospital budget.

Cardiac surgery

This department will be opened after six years absence since 1992. According to the statistics of the CCU in 1996, the total number of patients treated by this department was 794, the average number of days the patients were hospitalized was 2.4, and the mortality was 5.66%. According to the statistic on disease type, the patients assumed to have ischemic hear diseases account for more than 50% including 31.7% of angina pectoris, 19.3% of myocardial infarction, 18.6% of arrhythmias, and 7.2% of chest pain. Many of these patients need the examinations and treatments by cardiac catheterization, but they are not conducted at JUH at present. With the start of the cardiac catheterization examination scheduled for this year, the number of patients to visit JUH is considered to increase. All these facilities needed before open heart surgery will be prepared by this project.

In the surgical departments, two cardiac surgeons will return to JUH from Royal

Medical Service Hospital (army hospital) and two other surgeons will be coming back from the U.S.A. Therefore, among the seven requested items, all items are essential for the open heart surgery including the transmembranous pacemaker that can be also used at emergency and supplemental equipment for heart beat. For some items such as the defibrillator and the mattress with heat, the number to be procured is reduced by considering the frequency to use.

Cardiology

1. CCU

Among the ten (10) requested items, nine (9) items are determined apt for procurement. These items will replace those being used for treatment and diagnosis at present and those having been used for more than ten years. However with the start of the cardiac catheterization examination and the open heart surgery, the number of patients visiting this department will increase and the emergency cases must be handled. Thus although requested as new addition of equipment, the battery type transport monitor and the ultrasound machine are deleted from the procurement plan. The pulse oximeter, one of the excluded items, is requested for transporting the patients, thus can be incorporated to the item to be procured.

2. CCU recovery

Among the seven (7) requested items, five (5) items are determined apt for procurement. This room will be newly opened with the start of the open heart surgery. Thus five (5) items considered necessary for the progress observation such as the emergence from anesthesia after surgery or procedure or the presence of rehemorrhage are determined to be procured. Although the equipment will be procured because this is the new department, all items exist in the hospital at present. Therefore there should be no technical problem. The ventilator requested from this department is deleted because it can be shared with the CCU when the postoperative patients are transferred to the CCU after staying short period of time at the CCU recovery room for one day or so. The pulse oximeter, another deleted item, could be incorporated to the equipment to be procured.

CSSD

Among the requested three (3) items, one (1) equipment was determined apt for procurement. The steam sterilizer will replace the existing one which have been use for more than ten years. This equipment has been sterilizing more than three hundred packages for surgical sets, treatment sets, clothing and gauze sets. Thus replacement of decrepit equipment is considered apt. Among the two (2) deleted items, the ethylene oxide sterilizer is requested for replacement. However, considering the low frequency to use, the operating state of the present equipment, and the environmental effect, it is deleted from the procurement plan. The nipple sterilizer can be purchased with the hospital budget.

ENT

1. ENT / Audiology unit

Among the seven (7) requested items two (2) items are determined apt for procurement. In Jordan, there are many cases of intermarriage between close relatives, causing many children with disabled hearing compared with other countries. The number of outpatients is large and increasing. Thus the two (2) replacement items are determined to be procured. The deleted five (5) items are newly requested items that need new technique and the ones requested being overlapped with other department.

2. ENT / examination

Both the two (2) requested items are determined apt for procurement. The requested items are the basic equipment necessary for the ENT examination, and both are items replacing the existing ones that have been used for more than ten years. By considering the number of the existing equipment and its operating state, the number of head lights is reduced, but these are considered apt for procurement.

3. ENT / OPD

Among the four (4) requested items, two (2) items are determined apt for procurement. The items having been used for more than ten years and need replacement are determined to be procured. However, all the initially requested four (4) items are components of the fiberscope for nostril and larynx which are necessary to be replaced, they are changed to two sets of examination sets and procedure sets. Because in the endoscopic examination, the pain of patient is reduced when the diameter of the endoscope is smaller, it is considered apt to generally differentiate the one for examination and the one for procedure. The two (2) deleted items as the procurement item, the light source and the pharyngeal fiberscope, are included in the two items to be procured.

4. ENT / operation theater

Because only one (1) item was requested and replacement is considered necessary, it is determined apt for procurement. This item is a hard mirror used for nostril and sinus surgeries and used in the operation theater.

5. ENT / temporal bone lab.

Eight (8) items are requested, but all of them are deleted from final result. The requested items are those used at the temporal bone laboratory planned to be added for the training of students such as operating microscope, drill, and suction pump, but they are all deleted from the procurement plan because this is the laboratory to be newly introduced.

Gastroenterology

Only one (1) item was requested but it is deleted from the procurement plan because it is a newly procured equipment that requires new technique.

General surgery

Among the fifteen (15) requested items, eight (8) items are determined apt for procurement. The JUII has twelve (12) operation theaters including 2 day care operation theaters, one burn unit operation theater, and two OBGY operation theaters and conducts more than 9,000 operations a year. The general surgery department operates 3,000 cases a year, which accounts for one third (1/3) of the entire number of operations. The central operation room is the facility included in this project and the items that need replacement and supplement and insufficient in number are considered for procurement. The six (6) deleted items are those that could be purchased by the hospital budget.

IMCU

Among the eight (8) requested items, seven (7) items are considered apt for procurement. The IMCU is separated from the ICU and to be newly added at the corner of the internal medicine ward on the 6th floor. The recovering patients in the ICU and the patients in the general ward with poor prognosis are accommodated in the IMCU, which is located between the ICU and the general ward. The patients in the CCU and the burn unit will be also accommodated in the IMCU. Because the IMCU is newly added to the hospital, the equipment is new. However except for one (1) item, others are basic equipment owned in the hospital, and therefore deleted from the procurement plan. The battery type transport monitor, the deleted item, is considered to be able to be purchased with the hospital budget.

Laboratory

This department is an extremely large clinical examination department that examines approximately 1.3 million samples and has a total of eighty-two staffs including doctors, technicians, and assistants.

1. Clinical laboratory

Among the six (6) requested items, three (3) items are determined apt for procurement. The equipment having been used for more than ten years and needs replacement was determined to be procured. The deleted three (3) items are the centrifuges generally used at the laboratory must be procured imminently. These are to be purchased by the hospital budget and thus deleted from the procurement plan.

2. Electron microscopy

Three (3) items were requested, but deleted from the procurement plan because they are the equipment to be newly introduced.

3. Inborn errors of metabolism

Four (4) items were requested but deleted from the procurement plan because they are the newly introduced equipment requiring the analysis of department in Step 1.

4. Molecular biology

Nine (9) items were requested but deleted from the procurement plan due to the analysis of department mentioned in Step 1.

5. Tissue culture

Five (5) items were requested, but deleted from the procurement plan because they are the newly introduced equipment that require the analysis of equipment mentioned in Step 1.

Neurosurgery

Only one (1) item was requested and determined apt for procurement. This equipment is the ultrasound machine for neurosurgery and a newly added item, but determined quite effective because the existence of intracranial lesion after craniotomy or confirmation of the location of lesion can be conducted under the ultrasonic guide. The reasons for determining this equipment to be included in the procurement plan are that in the last year, 395 operations are conducted at the neurosurgical department, the number of patients to be treated with this machine is great, and the doctors' technique has been established by the education and training they received in overseas countries. This equipment could be shared with the entire operation theater and can be used for the emergency diagnosis or the auxiliary diagnosis at operation.

Nursing

1. Emergency Room

Among the requested five (5) items, four (4) items are determined apt for procurement. The emergency room has 20 beds and provides diagnosis and procedure under the 24-hour system. Four (4) items of supplement equipment that need replacement and insufficient in number are included in the procurement plan. The deleted one (1) item could be purchased by the hospital budget.

2. Ward-medical (5F/6F)

All the requested five (5) items are determined apt for procurement. The internal

medicine ward extends to the 5th and the 6th floors and has 109 beds. The requested item is a basic one used frequently in the ward. By comparing the existing number of equipment at each floor and the number of beds, the equipment insufficient in number and the one that need replacement are determined to be procured. The newly requested Doppler flow meter is determined to be included in the procurement plan because it is often used to confirm the peripheral blood vessels when inserting the intravenous or catheter tubes. In addition, with the use of this equipment, the operation becomes easy and gives no burden to the patients .

3. Ward-OB/GYN

The equipment determined apt for procurement was all requested three (3) items. The OBGY ward is located between the ground floor and the first floor and has 99 beds (39 beds for obstetrics, 30 beds for gynecology, and 30 beds for early pregnancy). The requested three (3) items are defibrillator, ECG, and infusion pump, which are determined to be procured because they have been used more than ten years and the existing ones need replacement.

4. Ward-pediatric (F7/F8)

All the requested five (5) items are determined apt for procurement. The pediatrics ward extends to the 7th and the 8th floors and has 58 beds. The requested item is the basic equipment frequently used at the ward. A part of the 8th floor is under construction at present and an addition of floor is being considered. By comparing the existing number of equipment at each floor and the number of beds, the equipment insufficient in number and the one that need replacement are determined to be procured. The newly requested Doppler flow meter is determined to be included in the procurement plan because it is often used to confirm the peripheral blood vessels when inserting the intravenous or catheter tubes. In addition, it is highly required in the pediatrics department because the blood vessels of the patients are fine.

5. Ward-surgical (F2/F3/F4)

Among the requested five (5) items, four (4) items are determined apt for procurement. The surgical ward extends to the 2nd, the 3rd, and the 4th floors and has 191 beds (91 beds for general surgery, 21 beds for neurosurgery, 17 beds for urology, 32 beds for orthopedic surgery, 16 beds for ophthalmology, 14 beds for ENT) where all kinds of patients are hospitalized. By comparing the existing number of equipment at each floor and the number of beds, the equipment considered insufficient in number and the one that needs replacement are determined to be procured. The newly requested Doppler flow meter is determined to be included in the procurement plan because it is often used to confirm the peripheral blood vessels. In addition, it is highly needed for observing the postoperative patients.

6. Wards

Only one (1) item was requested and determined apt for procurement. The beds in the wards have been used for more than fifteen years and are decrepit. Although the number of beds to be procured is small compared with the number of beds in the wards, two beds in each ward (from the 2nd to the 8th floors) are to be procured because they will be used by the patients hospitalized for a long period of time that need raising and lowering of the head and the legs of beds.

OB/GYN

1. Delivery room

Among the requested three (3) items, two (2) items are determined apt for procurement. The delivery room has two Caesarean operation rooms and two delivery rooms where 60 cases of C-section and 240 cases of delivery are conducted in a month. The equipment having been used for more than ten years and the supplement equipment of fetal monitor insufficient in number are determined to be procured. The deleted ultrasound machine is an equipment to be newly added, but because it is requested from many departments by being overlapped, it is determined to be shared.

2. Infertility laboratory

Among the requested forty-six (46) items, twelve (12) items are determined apt for procurement. This laboratory will be added newly as the IVF laboratory for extracorporal fertilization. However extracorporal fertilization entails many problems such as multiple pregnancy, teras, or ethical problem, these items are deleted from the procurement plan. However, in Jordan where polygamy or male chauvinism still exists and the adoption is not usual, infertility is a big problem and the examination and diagnosis of infertility are important. Therefore, for the purpose of implementing the diagnosis and examination whether natural pregnancy is possible or not, an ultrasound machine effective for the diagnosis of female infertility and the examination equipment related to the sperm test indispensable for the examination of male infertility are determined to be procured. The deleted thirty-six (36) items include those related to the treatment of infertility, those that can be incorporated into other equipment, and those that can be purchased by the hospital budget.

Ophthalmology

1. Ophthalmology / operation theater

Among the requested six (6) items, four (4) items are determined apt for procurement. The number of operated cases in the ophthalmology department was 1,560 last year. At present, the patients had to wait for six months until they could undergo operation.

Especially the number of patients with diabetics is large, and the number of outpatients as well as that of the cases undergoing operation are increasing. The equipment having been used for more than ten years and the one insufficient in number are determined to be included in the procurement plan. The deleted two (2) items are the items to be newly added and require new techniques.

2. Ophthalmology / OPD

Among the requested five (5) items, four (4) items are determined apt for procurement. The number of outpatients visiting the ophthalmology department was about 28,000 last year, among which about 10,000 cases were suffering diabetics. The equipment having been used for more than ten years and needs replacement is determined to be procured. The deleted one is the equipment that can be shared with the ENT.

3. Ophthalmology / examination

Among the requested three (3) items, two (2) items are determined apt for procurement. Because the requested three (3) items are the components to be connected to the operating microscope and the supplement equipment to do procedure and examination to enlarge the visual field or increase or decrease the luminance, they are greatly related to the operation theater. Especially the equipment effective for vitreomy and the replacement of existing equipment are determined to be procured. The number of surgical cases using the vitreomy is about 250 a year, but the number of cases with diabetics is large and there is a great demand for this equipment.

Orthopedic

1. Orthopedic / operation theater

Among the requested seven (7) items, four (4) items are determined apt for procurement. The number of cases undergoing orthopedic operation was 1,380 last year, among which about one third (1/3) underwent the spinal surgeries. The equipment having been used for more than ten years and effectively used for present surgeries as well as improving the safety of patients are determined to be procured. The deleted three (3) items are the item that need new techniques and the one requested being overlapped with other department.

2. Orthopedic / OPD

The requested two (2) items are determined not to be procured because they are the newly introduced equipment that need new technique.

PICU

Among the requested twenty (20) items, eleven (11) items are determined apt for procurement. This unit is going to be a newly added room to be separated from the ICU and the NICU so that it can be operated independently. The main patients are infants of six months or older and children and this unit accepts emergency cases also. In this procurement plan, basic equipment necessary for the ICU and not requiring new technique was determined to be procured. The deleted nine (9) items are the items that can be shared with other departments or that can be purchased with the hospital budget.

Physiotherapy

1. Hydrotherapy

Among the requested seven (7) items, three (3) items are determined apt for procurement. This department will be divided into two units with the construction of additional room so that one can be used for male and the other for female. The number of cases undergoing hydrotherapy is about 200 to 300 a month. From the religious reason, it is difficult to do hydrotherapy for male and female patients together. Thus the number of patients is limited at present. The equipment to be supplemented accompanying the division of rooms for male and female therapies and that cannot be shared by other equipment are determined to be procured. The deleted four (4) items are the ones that can be shared with other departments, that can be incorporated into the function of other equipment, and the one to be newly added and needs new technique.

2. Physiotherapy

Among the requested thirty-four (34) items, fourteen (13) items are determined apt for procurement. The physiotherapy room provides electrotherapy, therapeutic exercises, and function evaluation. Especially the room for electrotherapy will be divided into two rooms with the addition of one room so that they can be used separately for male and female patients. The items to be procured are those that need replacement or supplement accompanying the addition of room and yet that cannot be shared with other equipment. The deleted twenty-one (21) items are those that can be purchased with the hospital budget, the one related to the evaluation of function, that can be shared with other equipment, and the one with low priority.

Radiology

1. Echography

The requested one (1) item is determined apt for procurement. The number of cases undergoing ultrasound examination in this room was about 6,330 last year not including the examination conducted for the patients with heart diseases or at the ICU. In this plan, the equipment having been used for more than ten years is determined to be procured. The

orthopedic surgery and urology departments and PICU requested the same equipment, but they are deleted from the procurement plan.

2. Nuclear medicine

One (1) item was requested, but deleted from the procurement plan according to the final result.

3. Radiology

Among the requested nine (9) items, six (6) items are determined apt for procurement. The radiology department conducts all the x-ray related examinations and the number of cases examined in this room was 79,200 last year (67,000 by general radiography, 8,740 by CT scan, 100 by angiography, 1,520 by fluoroscopy, 1,100 by IVP, 530 by mammography, and 480 by others). In this procurement plan, the depicted equipment not overlapping with other donor is determined to be procured. The deleted three (3) items are the fluoroscopy machine overlapped with the aid from World Bank and the daylight film developer for lightening daylight for bright room which is difficult to be maintained.

Thoracic surgery

Among the requested four (4) items, one (1) item is determined apt for procurement. The number of operations conducted in the thoracic surgery department was 600 last year mainly consisting of pneumonectomy and bronchoscopy. In this plan, the equipment having been used for more than ten years is determined to be procured. The deleted three (3) items are the ones that can be shared with other departments and the one to be newly added.

Urology

Among the requested three (3) items, two (2) items are determined apt for procurement. The number of outpatients to this department was 8,120 last year and the number of surgical operations conducted last year was 685. The replacement equipment and the endoscopic set that is newly requested but existing in the operation theater at present and needs no new technology are to be procured. The deleted one (1) item is the equipment that could be shared by the requested item from the radiology department.

The equipment list prepared based on the above mentioned analysis is shown in Table 2-2.

Table 2-2 Equipment List

Requested Dep.	Room	Items	Qty	
Anesthesiology	ICU - Surgical	Bed	3-Crank Gatch	8
Anesthesiology	ICU - Surgical	Monitor	Bedside, with Invasive BP	4
Anesthesiology	ICU - Surgical	Monitor	Bedside	3
Anesthesiology	ICU - Surgical	ECG	3 Channel	1
Anesthesiology	ICU - Surgical	Syringe Pump		15
Anesthesiology	ICU - Surgical	Defibrillator	with Trolley and Inner Paddle	1
Anesthesiology	ICU - Surgical	Doppler	Portable	2
Anesthesiology	ICU - Surgical	Infusion Pump		6
Anesthesiology	ICU - Surgical	Mattress	Heat, Adult / Child	2
Anesthesiology	ICU - Surgical	Ventilator	Adult	3
Anesthesiology	ICU - Surgical	Cardiac Output Machine	Thermodilution Type	1
Anesthesiology	ICU - Surgical	Blood Gas Analyzer		1
Anesthesiology	ICU - Surgical	Suction pump	Portable	2
Anesthesiology	Operation Theater	Blood Warmer	Dry Type	7
Anesthesiology	Operation Theater	Laryngoscope	Fiber-optic	1
Anesthesiology	Operation Theater	Tourniquet	Double cuff	2
Anesthesiology	Operation Theater	Monitor	Bedside, with Invasive BP	4
Anesthesiology	Operation Theater	Anesthesia Machine	with Ventilator, Adult / Pediatric	3
Anesthesiology	Operation Theater	Nerve Stimulator	with Syringe	5
Burn Unit	B-Operation Theater	Anesthesia Machine	with Ventilator, Adult / Pediatric	1
Burn Unit	B-Operation Theater	Hand Washing Unit		1
Burn Unit	B-Operation Theater	Monitor	Bedside	1
Burn Unit	B-Operation Theater	Diathermy Machine	Bipolar	1
Burn Unit	B-Operation Theater	Dermatome	Electric	1
Burn Unit	B-Operation Theater	Meshes, Skin Graft		1
Burn Unit	B-Operation Theater	Mattress	Heat, Adult / Child	1
Burn Unit	B-Ward	Bed	3-Crank Gatch	8
Burn Unit	B-Ward	Doppler	Portable	1
Burn Unit	B-Ward	ECG	3 Channel	1
Burn Unit	B-Ward	Ventilator	Adult / Pediatric	2
Burn Unit	B-Ward	Mattress, Pressure Sore		2
Burn Unit	B-Ward	Monitor	Bedside	4
Burn Unit	Hydrotherapy	Therapy Tank		1
Burn Unit	Hydrotherapy	Showering System		1
Burn Unit	Hydrotherapy	Trolley	Lift Bath	1
Cardiac Surgery	CCU Recovery	Bed	3-Crank Gatch	6
Cardiac Surgery	CCU Recovery	Defibrillator	with Trolley	1
Cardiac Surgery	CCU Recovery	Defibrillator	with Trolley and Inner Paddle	1

Table 2-2 Equipment List

Requested Dep.	Room	Items		Qty
Cardiac Surgery	CCU Recovery	Infusion Pump		9
Cardiac Surgery	CCU Recovery	Monitor	Bedside, with Invasive BP	6
Cardiac Surgery	CCU Recovery	ECG	3 Channel	1
Cardiac Surgery	Operation Theater	Heart Lung Machine	4 Pumps	1
Cardiac Surgery	Operation Theater	Defibrillator	with Trolley and Inner Paddle	1
Cardiac Surgery	Operation Theater	Infusion Pump		3
Cardiac Surgery	Operation Theater	Mattress	Heat, Adult / Child	1
Cardiac Surgery	Operation Theater	Pacemaker	Transmembranous	2
Cardiac Surgery	Operation Theater	Syringe Pump		4
Cardiac Surgery	Operation Theater	Headlight	Fiber-optic	2
Cardiology	CCU	Defibrillator	with Trolley	2
Cardiology	CCU	Monitor	Bedside, with Invasive BP	8
Cardiology	CCU	Monitor	Central	1
Cardiology	CCU	ECG	3 Channel	2
Cardiology	CCU	Infusion Pump		11
Cardiology	CCU	Bed	3-Crank Gatch	8
Cardiology	CCU	Monitor	Portable, Battery Type, with SpO2	1
Cardiology	CCU	Ultrasound Machine	Cardiac, Portable	1
Cardiology	CCU	Ventilator	Adult	3
CSSD	CSSD	Steam Sterilizer		2
ENT	Audiology Unit	Evoked Potential Machine	Acoustic	1
ENT	Audiology Unit	Audiometer	Pediatric	1
ENT	ENT Examination	Examination Unit for ENT	with Headlight	3
ENT	ENT Examination	Headlight	Fiber-optic	4
ENT	ENT OPD	Fiber-optic Scope	Laryngeal, Treatment	1
ENT	ENT OPD	Fiber-optic Scope	Laryngeal, Adult / Child	1
ENT	Operation Theater	Endoscopic Sinus Surgery Set		1
General Surgery	Operation Theater	Operating Table	General 1, Cardiac 1, Orthopedic 1	3
General Surgery	Operation Theater	Suction Pump	Surgical, 2 Bottles	4
General Surgery	Operation Theater	Autoclave	Bench-Top	3
General Surgery	Operation Theater	Fumigator		2
General Surgery	Operation Theater	Solution Warmer		3
General Surgery	Operation Theater	Stretcher Trolley		4
General Surgery	Operation Theater	Electrosurgical Unit	Bipolar	3
General Surgery	Operation Theater	Operating Light	with Satellite Light	2
Internal Medicine	IMCU	Bed	3-Crank Gatch	8
Internal Medicine	IMCU	Defibrillator	with Trolley	1
Internal Medicine	IMCU	ECG	3 Channel	1

Table 2-2 Equipment List

Requested Dep.	Room	Items		Qty
Internal Medicine	IMCU	Infusion Pump		8
Internal Medicine	IMCU	Monitor	Bedside	4
Internal Medicine	IMCU	Monitor	Central	1
Internal Medicine	IMCU	Pulse Oxymeter		1
Laboratory	Clinical Lab.	Centrifuge, Refrigerated	Free Stand Type, for Blood Bank	2
Laboratory	Clinical Lab.	Coagulometer		2
Laboratory	Clinical Lab.	Gamma Counter		1
Neurosurgery	Operation Theater	Ultrasound Machine	for Intraoperative Use	1
Nursing	Emergency Room	Defibrillator	with Trolley	1
Nursing	Emergency Room	Stretcher Trolley		10
Nursing	Emergency Room	ECG	3 Channel	1
Nursing	Emergency Room	Doppler	Portable	1
Nursing	Ward-Medical (5/6)	Defibrillator	with Trolley	2
Nursing	Ward-Medical (5/6)	ECG	3 Channel	1
Nursing	Ward-Medical (5/6)	Doppler	Portable	1
Nursing	Ward-Medical (5/6)	Infusion Pump		6
Nursing	Ward-Medical (5/6)	Suction Pump	Portable	2
Nursing	Ward-OB/GYN	Defibrillator	with Trolley	1
Nursing	Ward-OB/GYN	ECG	3 Channel	1
Nursing	Ward-OB/GYN	Infusion Pump		2
Nursing	Ward-Pediatric(8/7)	Defibrillator	with Trolley	1
Nursing	Ward-Pediatric(8/7)	ECG	3 Channel	2
Nursing	Ward-Pediatric(8/7)	Suction Pump	Portable	1
Nursing	Ward-Pediatric(8/7)	Doppler	Portable	1
Nursing	Ward-Pediatric(8/7)	Infusion Pump		6
Nursing	Ward-Surgical(4/3/2)	Defibrillator	with Trolley	1
Nursing	Ward-Surgical(4/3/2)	ECG	3 Channel	2
Nursing	Ward-Surgical(4/3/2)	Doppler	Portable	1
Nursing	Ward-Surgical(4/3/2)	Infusion Pump		6
Nursing	Wards	Bed	3-Crank Type	14
OB/GYN	Delivery Room	Monitor System, Fetal	Connected to Nurse Station	1
OB/GYN	Delivery Room	Operating Light	with Satellite Light	4
OB/GYN	Infertility Lab.	Ultrasound Machine	with Vaginal Probe	1
OB/GYN	Infertility Lab.	Autoclave	Bench-Top	1
OB/GYN	Infertility Lab.	Camera and Video	Connected to Inverted Microscope	1
OB/GYN	Infertility Lab.	Centrifuge	Bench-Top	1
OB/GYN	Infertility Lab.	CO ₂ Incubator		1
OB/GYN	Infertility Lab.	Dry Oven		1

Table 2-2 Equipment List

Requested Dep.	Room	Items		Qty
OB/GYN	Infertility Lab.	Microscope	Inverted	1
OB/GYN	Infertility Lab.	PH Meter		1
OB/GYN	Infertility Lab.	Sperm Counting Chamber		1
OB/GYN	Infertility Lab.	Water Bath	56°C	1
OB/GYN	Infertility Lab.	Examination Lamp		1
OB/GYN	Infertility Lab.	Table, Examination	for OB / GYN	1
Ophthalmology	Operation Theater	Surgical Instruments	for Ophthalmology	1
Ophthalmology	Operation Theater	Surgical Microscope	with Video	1
Ophthalmology	Operation Theater	Vitrectomy Machine		1
Ophthalmology	Operation Theater	Laser System	Argon	1
Ophthalmology	Ophthal. OPD	Examination Unit for Ophthalmology		2
Ophthalmology	Ophthal. OPD	Refractometer	Automatic	1
Ophthalmology	Ophthal. OPD	Microscope	Specular	1
Ophthalmology	Ophthal. OPD	Perimeter	Automatic	1
Ophthalmology	Ophthalmology	Binocular Indirect Ophthalmomicroscope	BIOM	1
Ophthalmology	Ophthalmology	Stereoscopic Diagonal Inverter	SDI	1
Orthopedics	Operation Theater	Micro-Endoscopic System		1
Orthopedics	Operation Theater	Pneumatic Osteotome System	with Drills and Saws	1
Orthopedics	Operation Theater	Evoked Potential Machine	for Intraoperative Use	1
Orthopedics	Operation Theater	Laser System	for Spinal Surgery, Yag	1
Pediatrics	PICU	Bed	3-Crank Gatch	8
Pediatrics	PICU	Defibrillator	with Trolley	1
Pediatrics	PICU	EKG	3 Channel	1
Pediatrics	PICU	Incubator, Transport	for Neonates	1
Pediatrics	PICU	Infusion Pump		8
Pediatrics	PICU	Monitor	Bedside	4
Pediatrics	PICU	Pulse Oximeter		4
Pediatrics	PICU	Ventilator	Adult	1
Pediatrics	PICU	Ventilator	Infant	2
Pediatrics	PICU	Ventilator, Transport	Child	1
Pediatrics	PICU	Infant Warmer	for Resuscitation	2
Physiotherapy	Hydrotherapy	Butterfly Bath		1
Physiotherapy	Hydrotherapy	Massage Bath		1
Physiotherapy	Hydrotherapy	Jet Sprayer	Mobile	1
Physiotherapy	Physiotherapy	Parallel Bars	Adjustable	1
Physiotherapy	Physiotherapy	Quadriceps Bench		1
Physiotherapy	Physiotherapy	Cooler Unit	with Cold Packs	1
Physiotherapy	Physiotherapy	Intermittent Compression Unit	Portable	1

Table 2-2 Equipment List

Requested Dep.	Room	Items	Qty
Physiotherapy	Physiotherapy	Transcutaneous Electrical Nerve Stimulator (TENS)	7
Physiotherapy	Physiotherapy	Upper Limb Exercise Machine	1
Physiotherapy	Physiotherapy	Pulley System	1
Physiotherapy	Physiotherapy	Stimulator Multichannel	1
Physiotherapy	Physiotherapy	Vacuum Unit	1
Physiotherapy	Physiotherapy	Ultrasound Therapy Portable	1
Physiotherapy	Physiotherapy	Interferential Unit Portable	1
Physiotherapy	Physiotherapy	Electrotherapy Unit Portable	1
Physiotherapy	Physiotherapy	Combination Unit Ultrasound & Electrotherapy	1
Radiology	Echography	Ultrasound Machine Color Doppler	1
Radiology	X-ray	CT Scanner	1
Radiology	X-ray	X-ray Machine, General	1
Radiology	X-ray	X-ray Machine, IVP Intra-venous pyelogram	1
Radiology	X-ray	X-ray Machine, Mammogram	1
Radiology	X-ray	Film Developer Darkroom	3
Radiology	X-ray	X-ray Machine, Mobile	4
Thoracic Surgery	Operation Theater	Video Bronchoscope Set	1
Urology	Urology-OPD	Urodynamics System	1
Urology	Urology-OPD	Endoscopic Set, Urologic	1

CHAPTER 3 IMPLEMENTATION PLAN

Chapter 3 Implementation Plan

3-1 Implementation plan

3-1-1 Implementation concept

In this Chapter, the basic items for implementing the project as the grant aid cooperation are summarized and the items that need special care are clarified. The fields and the method for using the local consultant as well as the necessity for dispatching the engineers and the fields of engineers are specified. The agency and the departments responsible for each implementation stage are explained by clarifying the implementation system of the recipient country.

(1) Implementation system

1. Implementation agency

The Jordan University Hospital (to be referenced as "JUH" hereafter) in the Hashemite Kingdom of Jordan (to be reference as "Jordan" hereafter) will manage and implement this project as the responsible and operating agency. The Director General of JUH, who is the representative of the government of Jordan for the basic design study, will be in charge of general matters extending over this project as well as the implementation of this project.

2. Consultant

After the Exchange of Notes (to be referenced as "E/N" hereafter) is concluded between the governments of Japan and Jordan, the consultant of Japan will immediately conclude the consultant contract with the JUH representing the government of Jordan according to the procedure of the grant aid project of Japan. This contract becomes valid after verified by the Japanese government, based on which the consultant will implement the following operations.

- i) Detail design stage: Formulation of detail design specifications and other technical materials
- ii) Tender stage: Cooperation for the operations related to the selection of the supplier of equipment and materials as well as the procurement contract
- iii) Procurement stage: Management of the procurement of equipment and materials as well as pre-shipment inspection
- iv) Installation stage: Supervision of instruction on installation, operation, and maintenance

The consult will organize a team consisting of four engineers, namely, the project manager, the equipment planner, the facilities and utilities planner, and the cost and procurement planner to conduct the implementation design and supervise the implementation.

Project manager :

Manages the discussions between the governments of Japan and Jordan as the person responsible for the operations from designing to completion.

Equipment planner :

Confirms the equipment specifications with the Director General of JUH, and the manufacturers during the detail design, and collects the materials for cost estimation. After that, he prepares the necessary documents to submit to the governments of Japan and Jordan including the detail design specifications. He also conducts the shipping inspection.

Facilities and utilities planner :

Confirms the equipment specifications with the Director General of JUH, and the manufacturers at the time of detail design, and collects the materials on the state of equipment for installing the equipment and cost estimation. After that, he prepares the necessary documents to submit to the governments of Japan and Jordan including the detail design specifications.

Cost and procurement planner :

Reviews the cost estimation changed by the detail design in Japan and prepares the related materials. He also collects the materials for cost estimation again.

3. Supplier

The supplier is selected by the tender and concludes the contract with the JUH. This contract will become valid after verified by the government of Japan, and the said supplier procures and delivers the necessary equipment in accordance with the said contract as well as provides the technical instruction related to installation, operation, and maintenance of the said equipment. The supplier also supplies supplemental parts and consumables after delivery of the equipment, and constructs the maintenance system including the technical instruction. The supplier prepares the technical materials necessary for the maintenance after procurement such as manuals and formulates the list of the agents of manufacturers. Because the equipment to be procured includes the products of the third country, it is anticipated that the procurement would take more time than that for procuring the Japanese products. Therefore, the supplier must make sufficient adjustment with the implementation agency on the timings of

delivery and installation for the smooth implementation of the project.

(2) Implementation concept

1. After the conclusion of the F/N, the consultant must conduct sufficient meetings and take necessary procedures with the governmental agencies of Jordan and Japan, the supplier, and other necessary agencies for the smooth implementation of the project including the tender, selection of contractors, confirmation of manufacturing schedule, pre-shipment inspection , and the payment of project expenses.
2. Since the subject facility of the project is a hospital, it is difficult to conduct the delivery and installation of the equipment by interrupting the daily operations of the hospital. Therefore the consultant and the related parties of the hospital of the recipient country must closely discuss the work schedule in advance so that there would be no trouble in proceeding the project. In addition, when conducting the installation work, strict attention must be paid to the noise and the sanitary management when implementing the installation work and special attention must be paid to the safety management when delivering the medical equipment.
3. The equipment to be procured in Japan must undergo sufficient quality control, manufacturing inspection, and pre-shipment inspection in Japan in advance. The equipment to be procured in the third country must undergo pre-shipment inspection as a rule and the installation period must be observed.
4. As for the equipment that needs installation work, the supplier must dispatch the engineer(s) from the manufacturer to install the equipment. With regard to the equipment to which the dispatch of the engineer(s) from the manufacturer is difficult, the consultant must instruct the measures to the supplier so that the engineer(s) at the local agent of the manufacturer can substitute the installation work.
5. When delivering the equipment, the consultant must inspect the equipment at site, properly understand the results of the arrangement of equipment in each department, and confirm the completion of the delivery of equipment in this project.
6. In order to thoroughly inform the knowledge on the operation method and the maintenance of the procured equipment, the supplier must implement training and orientation by collecting the staff(s) in charge of each department and preparing the curriculum in advance. Training will not be implemented for the equipment if the knowledge on that equipment can be obtained through the operation and maintenance manual and confirmed by the manual. In addition, the method of regular inspection by the staff(s) in charge of the maintenance

department must be confirmed for the purpose of strengthening the training. This item must be thoroughly informed based on the results of the "Project for Medical Equipment Supply" implemented in 1994.

3-1-2 Implementation conditions

(1) Japanese side

In this project, the equipment will be transported to the city of Amman, which is the capital of Jordan. However Aqaba where the equipment will be unloaded is located about 335 km from Amman, it is necessary to prepare an effective transportation method. After the equipment is transported, the related party of the JUH will conduct the acceptance inspection after opening the packages, installing and adjusting the equipment, and instructing the operating method.

(2) Jordanian side

The JUH has conducted renovation in the Hospital with the loan from World Bank. When the detail arrangement of equipment is determined in the design stage, the primary construction of electric as well as water supply and drainage facilities must be completed before the installation work is started.

3-1-3 Scope of works

The outline of the scope of works of this project borne by the Japanese and the Jordanian parties is as follows.

(1) The scope of works borne by the Japanese party

- i) To procure the equipment
- ii) To bear the marine transportation expenses and provide the inland transportation to the medical facilities
- iii) To install the equipment
- iv) To provide the technical instruction on the test run, operation, periodical inspection, and maintenance of the procured equipment

(2) The scope of works borne by the Jordanian party

- i) To provide the information and materials necessary for installation
- ii) To provide a place to be used as a temporary office in the hospital during the implementation period
- iii) To provide the facility and the place necessary for the installation of procured equipment
- iv) To prepare and provide the primary appurtenant construction of peripheral foundations such as electricity, water supply and drainage, and other facilities necessary for the

installation of equipment before installing the equipment, and remove the existing equipment located in the place where the new equipment is to be installed (X-ray machine, CT-scanner, Steam sterilizer, Bath, etc.)

- v) To provide the storage place of the equipment after the equipment is delivered until the installation work is started
- vi) To facilitate the smooth unloading, customs clearance, and domestic transportation of the equipment to be imported
- vii) To exempt the payment of taxes and customs from the Japanese people staying in Jordan for the implementation of this project
- viii) To provide facilities and pay sufficient consideration to the security of safety of the Japanese people incoming to and staying in Jordan for delivering of equipment and providing services necessary for the implementation of this project
- ix) To bear the necessary expenses for the procedures of banking arrangement (B/A) and the authorization to pay (A/P)
- x) To arrange the budget and the personnel necessary for the effective implementation of this project including the O/M cost of the equipment to be procured by the grant aid
- xi) To prepare the plan to use the main equipment procured by the grant aid and report the state of using the equipment to the JICA office and the Japanese embassy in Jordan for the period of five years on regular basis
- xii) To provide the operations and bear the expenses for proper and effective maintenance of the equipment procured by the grant aid
- xiii) To obtain permissions and licenses and provide and obtain authorizations necessary for the implementation of grant aid project
- xiv) To bear the expenses accompanying the tax exempt procedures
- xv) To bear the expenses necessary for the implementation of this project and not included in the above mentioned scope of works to be borne by both the Japanese and the Jordanian parties

3-1-4 Consultant supervision

The consultant of Japanese corporation must conclude the consultant contract with the JUH, which is the implementation agency of Jordan, and conduct detail design and consultation of the project according to the grant aid system of Japan. The purpose of consultation is to confirm whether the work processes and contents are implemented in accordance with the design documents, to instruct, advise, and adjust the construction period on the fair standpoint for securing proper implementation of the contents of equipment procurement contract, and improve the quality. The consultation consists of the following works.

(1) Tender and supplier contract work

The consultant must prepare the tender documents necessary for the tender for selecting the Japanese contractor for the procurement and installation of the equipment, conduct the tender related works such as publishing the tender, accepting the application for the participation to tender, examining the qualification for tender, delivering the tender documents, accepting the bidding documents, and evaluating the tender results, as well as provide advice to the procurement of equipment and the conclusion of equipment procurement contract and supplier contract between the JUH and the contractor.

(2) Provision of instruction, advice, and adjustment

The consultant must examine the implementation schedule, implementation plan, procurement plan of equipment and materials, and procurement and installation plan of medical equipment, and provide instruction, advice and adjustment to the supplier.

(3) Inspection and approval of shop drawings and as-built drawings

The consultant must inspect, instruct, and approve shop drawings and as-built drawings and documents submitted from the supplier.

(4) Confirmation and approval of the procured equipment

The consultant must confirm whether the medical equipment procured by the supplier matches to the contract document, and approve the use of the equipment.

(5) Pre-shipment inspection

The consultant must witness the inspection of the medical equipment at the manufacturing factory as necessary to secure the quality and the performance.

(6) Report of progress state of work schedule

The consultant must understand the state of implementation schedule and the implementation site, and report the progress state of the works to the related agencies of both countries.

(7) Completion inspection and test run

The consultant must conduct the completion inspection and the test run of the medical equipment, confirm that the equipment conforms to the contents of the contract document, and submit the certificate of completion of inspection to the government of Jordan.

(8) Instruction for the technical training on operation and maintenance

Because some items of equipment need technical knowledge on the operation and

maintenance, it is necessary to conduct the training to the person(s) in charge of each equipment to understand the operation method, inspection method, and repair technique during the periods of installation, adjustment, and test run according to the curriculum. The consultant must provide the instruction and advice for the training.

Judging from the scale of this project, in implementing the above mentioned works, the consultant does not need to dispatch engineers throughout the entire project period. Therefore, the consultant must arrange the necessary engineers at site according to the progress state of the project to have them inspect, instruct, and adjust the equipment, arrange the engineers in charge in Japan, as well as establish a liaison and support system with the project site. In addition, the consultant must report necessary matters on the progress state of this project, the payment procedure, and the delivery to the related government agencies of Japan.

There is no special matter to mention on the related laws and regulations and the labor state.

3-1-5 Procurement plan

Based on the difficulty in obtaining materials, the future repair, and the difficulty of maintenance service in Jordan, the consultant must summarize the concept of procurement of equipment and materials, and describe the actual reasons for procuring the equipment from Japan or the third country and the shipping route from these countries.

(1) Local procurement

As a result of considering the distribution state of equipment and consumables and the repair and maintenance services after they are procured in Jordan, the local procurement of equipment for this project is determined basically difficult. Medical equipment is not manufactured in Jordan except for the stainless steel goods and the beds and furniture for medical purposes.

(2) Possibility of procuring the equipment manufactured in the third country

In Jordan, the maintenance system of the medical equipment manufactured in Japan is being prepared and the after-sales services of the equipment after delivery are considered to have no problem. However judging from the state of the manufacturers of the existing equipment in the hospital of this project, it is necessary to consider the procurement of equipment from the third country.

In procuring the equipment, the equipment must be selected from the one made by the manufacturers having local branch office or agent, the installation of which can be conducted

securely, and the established after-sales care of which can be conducted after delivery.

When selecting the equipment from the one manufactured other than in Japan, selection must not be made only by the reason that the price is reasonable, but by considering the future maintenance and the technical ability of Jordan. The difficulty of procurement, the repair and after-sales care system including the availability of repair parts and consumables, and the degree of popularity in Jordan constitute the main elements for procuring the equipment not manufactured in Japan.

(3) Unit price of each equipment and the maintenance system of local agent

After comparing the unit price of each equipment procured in Japan and the third country including the packaging, transportation, and insurance fees, if the equipment procured from the third country is determined to have cheaper unit price and the local agent has the necessary sufficient maintenance system, priority is given to the equipment procured from the third country on the premises that the quality required for this project can be secured,

The equipment determined to have favorable conditions if procured from the third country includes the laser device and the equipment for ophthalmology department. These items have been extensively used in Jordan and confirmed that the maintenance system of local agent had no problem.

(4) Transportation period

As for the equipment to be procured from Japan and some of the third countries (U.S.A.), a total of about forty to fifty days are necessary for transportation including thirty to forty days for marine transportation, about fifteen days for the procurement from other third country (mainly from European countries), about ten days for customs clearance, and about one days for the domestic transportation in Jordan from Aqaba Harbor to the hospital. By considering the unloading and the customs clearance, a procurement plan having sufficient allowance for time must be formulated.

3-1-6 Implementation schedule

If the Exchange of Notes (N/E) on the implementation of this project is concluded between Japan and Jordan, the succeeding implementation schedule is divided into the following three stages, that is, detailed design work, tender work, and equipment procurement.

(1) Detailed design work

After the consultant contract is concluded between the JUH and the consultant of Japanese corporation, the consultant will start the detailed design work when the contract is verified by the government of Japan. In the detailed design work, a set of tender and design documents including detailed design drawings, specifications, and the guideline for tender are

formulated. In the meanwhile, the consultant will have discussions with the Jordanian party with regard to the facilities and the contents of equipment, and obtain the final approval for a set of tender and design documents. The period needed for the design work is expected to be about two months including detailed design, domestic work in Japan, and the approval of documents.

(2) Tender work

The contractor for procuring the equipment is selected by the tender. The tender proceeds in the order of publishing of tender, acceptance of tender application, examination of qualification, delivery of tender documents, tendering, report of the results of tender, appointment of the contractor for the procurement of equipment, and the contract for procurement of equipment, which takes about two months.

(3) Equipment procurement

After the contractor contract is concluded, the contract work is started through the verification of the contract by the government of Japan. As a result of estimating the project period by considering the contents and the size of the facility, contents of the contract, and the weather conditions, the project period will need approximately 7.9 months.

The entire project period until the conclusion of E/N and the completion will need approximately 11.9 months which includes the following.

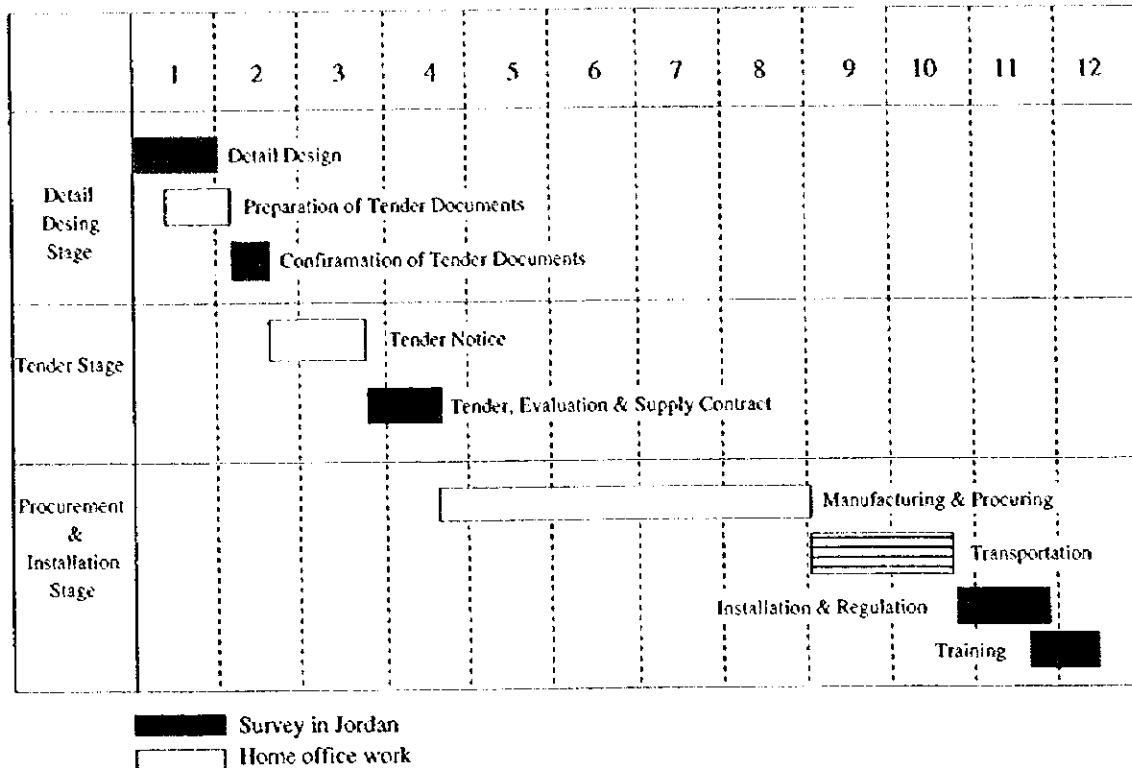


Figure 3-1 Implementation Schedule

3-1-7 Obligations of the recipient country

The obligations of Jordan in relation to the implementation of this project are indicated in Section 2-1-3, and the following items must be properly implemented.

- i) To prepare and provide the primary appurtenant construction of peripheral foundations such as electricity, water supply and drainage, and other facilities necessary for the installation of equipment before installing the equipment, and remove the existing equipment located in the place where the new equipment is to be installed
- ii) To provide the storage place of the equipment after the equipment is delivered until the installation work is started
- iii) To facilitate the smooth unloading, customs clearance, and domestic transportation of the equipment to be imported
- iv) To exempt the payment of taxes and customs from the Japanese people staying in Jordan for the implementation of this project
- v) To provide facilities and pay sufficient consideration to the security of safety of the Japanese people incoming to and staying in Jordan for delivering of equipment and providing services necessary for the implementation of this project

- vi) To bear the necessary expenses for the procedures of banking arrangement (B/A) and the authorization to pay (A/P)
- vii) To obtain permissions and licenses and provide and obtain authorizations necessary for the implementation of grant aid project
- viii) To bear the expenses accompanying the tax exempt procedures

3-2 Operation and Maintenance Plan

3-2-1 Approximate Project cost

The cost for implementing this project is shared by the Government of Jordan and the Government of Japan as follows.

(1) Japanese party

Cost for designing and procuring the equipment.

(2) Expenses borne by Jordan

The departments that need rehabilitation using the equipment to be procured by this Project are as follows, all of which are expected to start constructions under the budget of Jordan (approximately 1 million JD/about 170 million yen). The rehabilitation will be completed in May 1998.

Surgical Dept.	Operation Theater for Cardiac Surgery
Special Units Dept.	CCU, CCU Recovery, IMCU, Burn Unit, PICU
Physiotherapy Dept.	Physiotherapy Room

(3) Cost estimation condition

1. Estimated in : January 1998
2. Exchange rate : US\$ 1.00 = 125 yen , J.D. 1.00 = 176.55 yen
3. Period for implementation : 11.9 months
4. Ordering method : bundled in a lot
5. Others : This project shall be implemented in compliance with the system of grant assistance of the Government of Japan. The cost estimation is made on the premises that the import duties on the equipment and materials, the business tax to the Japanese corporation, and the domestic tax in Jordan are to be exempted or to be paid by the government of Jordan.

The government of Jordan must expect to pay the following expenses as the commissions and the taxes.

- i) Expenses for public procedures necessary for the delivery of equipment
- ii) Duties on the importation of equipment and materials
- iii) Commissions for banking arrangements and for issuance of authorization to pay
- iv) Expenses necessary for the tax exempt procedures for domestic tax and other financial surcharges and the payment of value added taxes

For the smooth implementation of this project and the effective use of the equipment immediately after installation, the government of Jordan must make the budgetary measures for these items on proper timing.

3-2-2 Operation and maintenance Costs

(1) Maintenance system at the JUH

The medical equipment in the JUH is maintained by the maintenance department of the JUH as a rule. However, the main expensive equipment such as the CT scanner is maintained by concluding a maintenance contract with the local agent.

The maintenance department of JUH conducts the maintenance on the three-shift system (7:00 a.m. to 3:00 p.m., 2:30 p.m. to 9:30 p.m., and 9:00 p.m. to 7:00 a.m.) with a total of fifty-nine staffs including four engineers and fifty-five technicians at present. The maintenance department is lead by the chief engineer and divided into three sections of medical equipment, equipment, and facility sections.

The medical equipment and facility maintained under the maintenance contract by the local agent are as follows. The maintenance contract fee that the JUH pays is a total of 189,000 JD (approximately 32 million yen in 1996).

- * CT scan
- * X-ray fluoroscopy machine
- * Peritoneal dialysis machine
- * Paging system
- * Elevator
- * Computer system

The equipment to be procured in this project include the above mentioned equipment and the maintenance contract will be concluded.

(2) Operation and maintenance costs of this project

About half of the equipment to be procured in this project is the replacement of the existing equipment. By replacing the equipment often causing trouble at present, the maintenance expenses for the repair the JUH pays at present is considered to be basically

reduced.

In addition, among the supplement and replacement equipment to be procured, the following nineteen types of equipment (forty-six items) need consumables, most of which are recording papers and so on. Thus they will be maintained without any trouble considering the maintenance budget of the JUH. Detail annual maintenance expenses for each equipment are shown in Tables 3-1.

Table 3-1 : Annual running cost for main equipment

Description	Q'ty	Cost per unit (,000yen)	Total (,000yen)	Total (J.D.)
Defibrillator	6	96	576	3,429
ECG	6	164	984	5,857
Evoked Potential Machine	1	256	256	1,524
Heart Lung Machine	1	5,752	5,752	34,238
Incubator for Transport	1	49	49	292
Laser System, argon	1	1,020	1,020	6,071
Laser System, Yag	1	1,380	1,380	8,214
Bedside Monitor with NIBP	13	90	1,170	6,964
Bedside Monitor with IBP, NIBP	6	336	2,016	12,000
Transport Cardiac Monitor	1	84	84	500
Cardiac Output Machine	1	2,041	2,041	12,149
Central Monitor	1	154	154	917
Fetal Monitor Central System	1	1,689	1,689	10,054
Ultrasound Machine for CCU	1	1,162	1,162	6,917
Ultrasound Machine for Intraoperative	1	1,621	1,621	9,649
Ventilator for Adult, Pediatric	2	714	1,428	8,500
Ventilator for Infant	2	714	1,428	8,500
Transport Ventilator for Child	1	714	714	4,250
Blood Gas Analyzer	1	1,333	1,333	7,935
Amount	48	19,369	24,857	147,960

The annual budget of about 1.8 million JD (approximately 170 million yen) in 1996 necessary for maintaining the equipment at the JUH includes the total amount of the expenses for disposables, laboratory supplies, X-ray supplies, and drugs which fall under the expenses for drugs and materials, and the expenses for maintenance contract fee and spare parts

appropriated as the general expenses. On the other hand, the maintenance cost necessary for the equipment procured by this project according to Table 2-1 is about 147,000 JD (approximately 24 million yen), thus the amount to increase accounts for approximately 14% of the total expenses. As mentioned before, because the reduction of the maintenance cost could be expected from the replacement of equipment, addition of budget is considered not specially necessary.