

MINISTRY OF HEALTH

THE REPUBLIC OF SURINAME

NO. 1

BASIC DESIGN STUDY REPORT
ON
THE PROJECT FOR THE IMPROVEMENT OF
MEDICAL EQUIPMENT
IN
THE ACADEMIC HOSPITAL OF PARAMARIBO
IN
THE REPUBLIC OF SURINAME

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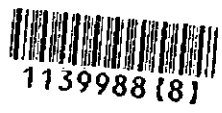
JANUARY 1997

JAPAN INTERNATIONAL COOPERATION AGENCY
International Consultants Corporation

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PREFACE

In response to a request from the Government of the Republic of Suriname, the Government of Japan decided to conduct a basic design study on the Project for the Improvement of Medical Equipment in The Academic Hospital of Paramaribo and entrusted the study to the Japan International Cooperation Agency (JICA).

JICA sent to Suriname a study team from August 7 to September 5, 1996.

The team held discussions with the officials concerned of the Government of Suriname, 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 Suriname in order to discuss a draft basic design, and as this result, the present report was finalized.

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

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

January, 1997



Kimio Fujita

President
Japan International Cooperation Agency

January , 1997

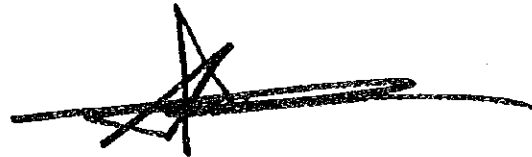
Letter of Transmittal

We are pleased to submit to you the basic design study report on the Project for the Improvement of Medical Equipment in The Academic Hospital of Paramaribo in the Republic of Suriname.

This study was conducted by International Consultants Corporation, under a contract to JICA, during the period from August 2, 1996 to February 24, 1997. In conducting the study, we have examined the feasibility and rationale of the project with the consideration to the present situation of Suriname 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,



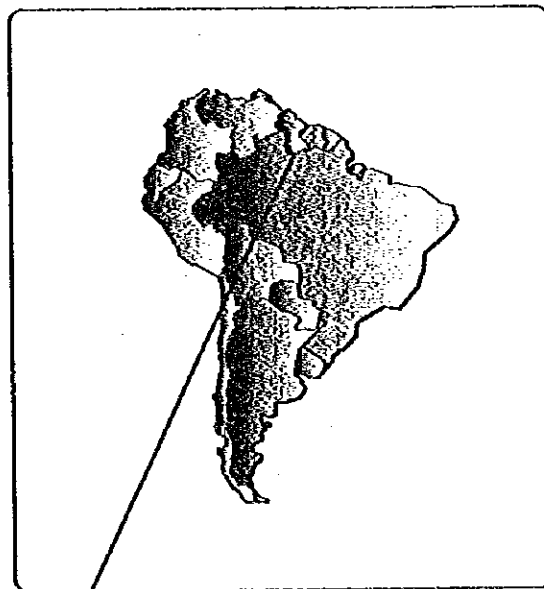
Akira Sato

Project Manager,
Basic Design Study Team on the Project for
the Improvement of Medical Equipment in
The Academic Hospital of Paramaribo in
the Republic of Suriname

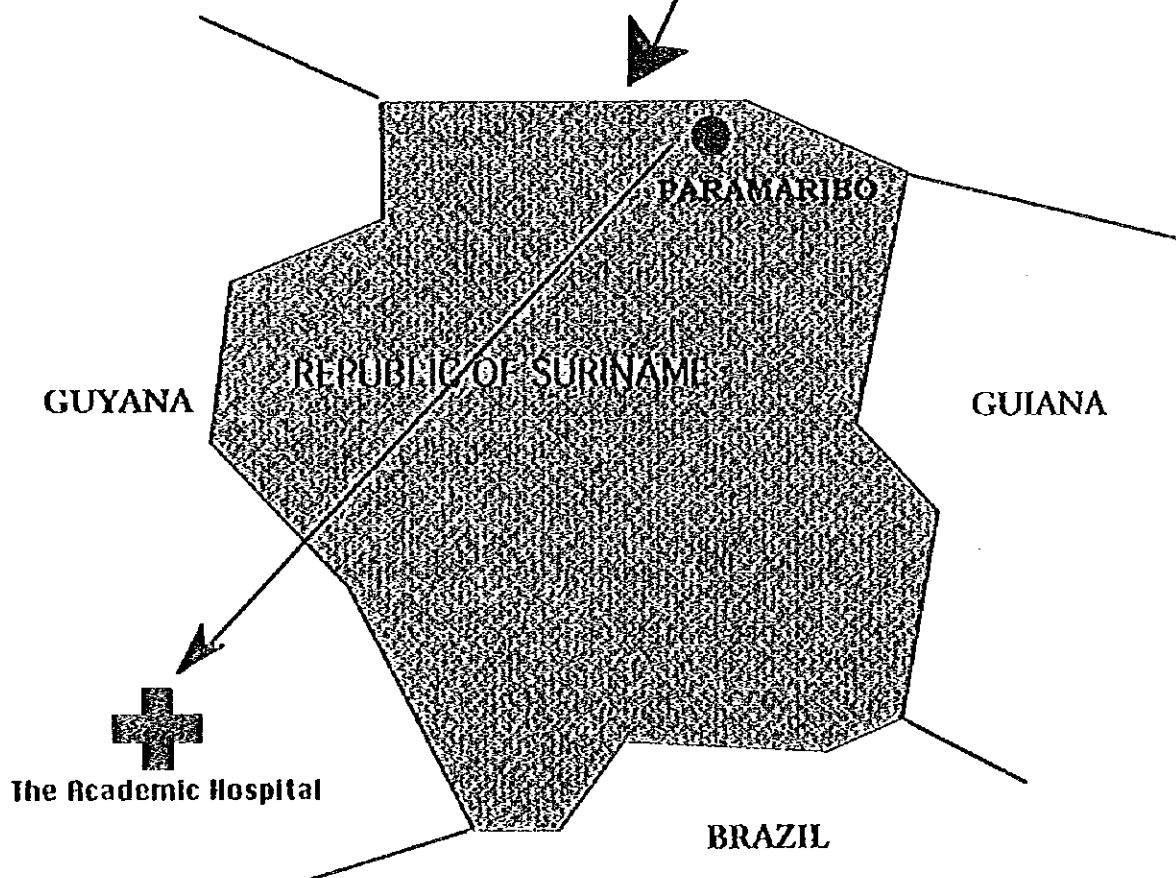
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Project Site

SOUTH AMERICA



ATLANTIC OCEAN



GUYANA

REPUBLIC OF SURINAME

GUIANA

BRAZIL



The Academic Hospital

SUMMARY

The Republic of Suriname (hereinafter referred to as "Suriname") is situated in the north coast of South America, being bordered by the Republic of Guyana, French Guiana and the Federative Republic of Brazil. Suriname is a constitutional republic with a population of 443,000 (in 1994) in its territory of 163,000 square kilometers (about half the area of Japan's territory). Since Suriname's economic development started with bauxite mining (in 1982 Suriname was the fourth largest bauxite exporter in the world), the aluminum industry has become the country's most important industry (the output of alumina and aluminum accounts for about 78% of the total export). Since 1980, Suriname's economy has been in depression due to a decline in international bauxite price, causing a decline in production and international marketing. This resulted in a decrease in income from bauxite export, and Suriname's GNP/C was reduced to as low as 870 dollars in 1994. In order to overcome the lingering economic difficulties, the Government of Suriname has implemented the Structural Adjustment Program, basically with the assistance of the Netherlands. Still, economic conditions remain hard in the country.

The Government of Suriname has set the goal of "Health for All by the Year of 2000" in its policy on health and medical care, based on the Alma-Ata declaration "All the People of the World Should be Benefited by the Policy on Health and Medical Care by 2000" in the international conference on primary health care (PHC) sponsored by WHO/UNICEF in September 1978. Appropriations for health and medical care are, however, restricted by the government's financial policy in implementing the Structural Adjustment Program. Expenditures for health and medical care accounted for only 7.5% of GNP in 1990 and as low as 3.2% in 1994. This shows that the goal will be hardly achieved. In its effort to reform the field of health and medical care, the government has been promoting the strengthening of hospital management and rehabilitation/replacement of superannuated facilities and equipment. It is especially difficult for the government to rehabilitate or replace superannuated equipment and facilities by its own efforts, due to investment shortages and delayed reinvestment.

The Academic Hospital of Paramaribo, which is the target of the project, is the largest (with 396 beds) of five hospitals in Suriname (two of which are private hospitals). The Academic Hospital of Paramaribo is Suriname's top referral hospital and research institution, and medical personnel receive training there after graduating from medical colleges. The hospital is the foundation of Suriname's health and medical care system. The hospital plays an important role as a government-managed hospital in providing health and medical services especially for the low income brackets, but thirty years have passed since the hospital was established in March 1966, with the assistance of the Government of the Netherlands. Its superannuated equipment does not work properly though some pieces of equipment have been repaired or replaced and spare parts have been supplied, with assistance from the Netherlands, Belgium and other countries. A number of pieces of equipment do not work efficiently because of budgetary constraints preventing the replacement of them, as well as due to inadequate maintenance. This becomes a great impediment in everyday medical examination and treatment and produces a condition which does not satisfy the minimum standard for promoting the people's health. In order to cope with the situation, the Government of Suriname has formulated a project for the improvement of medical equipment in The Academic Hospital of Paramaribo and requested grant aid assistance from Japan, with a view to improving health and medical services, which are unsatisfactory due to the superannuated and insufficient equipment of the hospital.

The Government of Japan decided to conduct a basic design study in order to know the background and the contents of the project and ascertain the system of its implementation. The Japan International Cooperation Agency (JICA) dispatched a study team in August 1996, for the purpose of studying the appropriateness of the project's implementation under Japan's grant aid scheme and defining the contents of the project and the scope of cooperation, including the propriety of extending grant aid cooperation. The team had discussions with the officials concerned of the Government of Suriname, collected materials, and studied medical services provided in the country and the actual conditions of The Academic Hospital of Paramaribo, the target of the project. The team, returning to Japan, analyzed the study results, and gave an explanation in November 1996 in Suriname on the outline of the basic design. After that, the team defined the most suitable pieces of equipment to be provided under the project, and prepared the present report.

The Academic Hospital of Paramaribo, which is the target of the project, is Suriname's top referral hospital playing a leading role in not only medical activities including medical examination and treatment but also providing guidance for the medical institutions and training for medical workers of the country.

Among the pieces of equipment in the original request, there were not only basic and indispensable ones but also those which required high technologies and large expenses for operation and maintenance. In studying the reasonableness of the requests, the team gave consideration to the objectives and functions of the hospital and the conditions of the existing equipment being used, and, based on this, defined basic, priority and deletion principles, as mentioned below.

(1) Basic principle

- 1) The requested equipment shall be appropriate in view of hospital's functions and levels of medical services provided there.
- 2) The requested equipment shall be in conformity with the existing equipment.
- 3) The requested equipment can be used/operated in the present system (by the doctors and the technicians) of the hospital.
- 4) The requested equipment shall not include the same units or pieces as the existing ones.
- 5) The cooperation of Japan shall not overlap that of other assisting organizations.

(2) Priority principle

- 1) The requested equipment shall be basic and indispensable for medical examination and treatment.
- 2) The requested equipment shall be a replacement of the existing equipment.
- 3) The requested equipment shall be easier to use with established technologies.
- 4) The requested equipment shall be that which makes it possible to fully identify the needs for medical examination and treatment (e.g., the numbers of patients and examinations).
- 5) The requested equipment shall be more cost-effective.
- 6) The requested equipment shall be that whose maintenance cost can be borne by the recipient country.

(3) Deletion principle

- 1) Those pieces of equipment which have the possibility of violating the laws and the environmental laws and regulations now in force in one or both of Japan and Suriname shall be deleted.
- 2) Those pieces of equipment which need the construction of new facilities or a great deal of remodeling of the existing facilities shall be deleted.

- 3) Those pieces of equipment in which radioactive isotopes are used and those pieces of equipment related to them shall be deleted.
- 4) Those pieces of equipment in which substances producing environmental problems, such as chlorofluorocarbons, are used shall be deleted.
- 5) Those pieces of equipment which need the establishment of new departments and the introduction of new technologies shall be deleted.
- 6) Consumable supplies and reagents shall not be provided individually.
- 7) Those locally available pieces of equipment which can be purchased within the range of the hospital's budget shall be deleted.
- 8) Those pieces of equipment whose functions are the same as those of pieces of equipment requested elsewhere shall be deleted.
- 9) Those pieces of equipment which have been purchased after the Government of Suriname made the request for Japan's grant aid or for which a budgetary measure has already been taken shall be deleted.
- 10) Those pieces of equipment whose operation and maintenance are thought to be difficult because of the absence of maintenance and management agencies in the recipient country shall be deleted.

The requested pieces of equipment are used in the departments of The Academic Hospital of Paramaribo, namely, Anesthesiology, Cardiology, Dermatology, Dietetics, Emergency Room, E.N.T., Gynecology, Intensive Care Unit, Internal Medicine, Laboratory, Neurology, Oral & Maxilla Facial Surgery, Operating Room, Ophthalmology, Orthopedics, Pathological Laboratory, Pediatrics, Pharmacy, Physiotherapy, Plastic and Reconstructive Surgery, Radiology, Rehabilitation, Surgery, Urology and Ward.

The agency responsible for the project is the Ministry of Health of Suriname, while The Academic Hospital of Paramaribo is the implementing agency. The implementation of the project requires about 12 months from the conclusion of a consulting contract and the Exchange of Notes (E/N) between Japan and Suriname to the project's completion. As the pieces of equipment to be provided are mostly replacements of existing ones, the Government of Suriname need not bear an especially large sum of construction cost.

The operation budget of the hospital after the project's completion is estimated at 3,275,586 Suriname guilders (approximately 880 million yen) annually, which is covered by the budget of the Ministry of Health and medical examination and treatment fees from patients. Part of this sum is appropriated to the operation and maintenance of the pieces of equipment provided under the project. If this budget is duly executed, the provided pieces of equipment will be operated and maintained satisfactorily by the personnel of Suriname.

The project's implementation expands public medical services, and makes it possible for the hospital to provide more substantial medical examinations and treatment and thereby improve medical services for the residents in the region, including poor people. The population of the region covered by the hospital's medical services accounts for 80% of the total population of Suriname (about 350 thousand people). Education and training for medical workers by using provided pieces of equipment will promote education and training for doctors, nurses and other paramedical workers. This will result in raised medical levels and the strengthening of functions in 95 medical institutions under the control of the Ministry of Health, namely, four referral hospitals, three regional hospitals, 11 health centers, 28 clinics, and 49 health posts. Expected effects are so great, and the project's implementation will contribute to the improvement of the residents' BHN. It can be concluded, therefore, that it is highly appropriate to implement the project under Japan's grant aid scheme. There is no problem in the project's operation and management by the personnel

of Suriname from the viewpoints of both human resources and finances.

It is important to conduct inspections and maintenance work regularly for the pieces of equipment so that they will be operable for a long period of time. It is necessary to provide an equipment register and a regular inspection book for effective operation and maintenance. It is also necessary to prepare operation and maintenance manuals for the proper operation and maintenance of the pieces of equipment in the hospital.

CONTENTS

preface	
Letter of Transmittal	
Location Map / Perspective	
Abbreviations	
Chapter 1 Background of the Project	..... 1
Chapter 2 Contents of the project	..... 3
2-1 Objectives of the Project	..... 3
2-2 Basic Concept of the Project	..... 3
2-3 Basic Design	..... 69
1-3-1 Design Concept	..... 69
1-3-2 Basic Design	..... 71
Chapter 3 Implementation Plan	..... 109
3-1 Implementation Plan	..... 109
3-1-1 Implementation Concept	..... 109
3-1-2 Implementation Plan	..... 110
3-1-3 Scope of Works	..... 111
3-1-4 Consultant Supervision	..... 112
3-1-5 Procurement Plan	..... 114
3-1-6 Implementation Schedule	..... 114
3-1-7 Obligations of recipient country	..... 116
3-2 Project Cost Estimation	..... 117
3-3 Operation and Maintenance Costs	..... 118
Chapter 4 Project Evaluation and Recommendation	..... 127
4-1 Project Effect	..... 127
4-2 Recommendation	..... 128

(Appendices)

- 1. Member List of the Survey Team**
- 2. Survey Schedule**
- 3. List of Party Concerned in the Recipient Country**
- 4. Minutes of Discussion**

Chapter 1
Background of the Project

Chapter 1 Background of the Project

Economic development in Suriname began mainly with bauxite mining. The aluminum industry has been increasing its importance in the economy of Suriname, with the output of alumina and aluminum accounting for about 78% of the total export. Domestic economy has been in depression since 1980 due to a decline in international bauxite price, and deficit finance has persisted since 1981. Economic difficulties have been aggravated rapidly as a result of the suspension of assistance from the Netherlands since the military regime was established in 1983. Since then, economy has not take a turn for the better at all, and economic difficulties have caused repeated Cabinet changes. Since 1981 the brakes have been lifted from ordinary government expenditures, which have been expanded rapidly. Moreover, a sharp decline in revenue from the aluminum industry further aggravated economic difficulties, increasing the budget deficit up to nearly 30% of GDP in 1983.

After that, income from aluminum-related exports continued to decrease, and GNP/C declined to 870 dollars in 1994. In order to over-come these lingering economic difficulties, the Government of Suriname has been implementing the "Structural Adjustment Program," being assisted by the Government of the Netherlands. Still, economic conditions remain severe in Suriname.

This situation resulted in the deterioration of medical equipment and shortages of medical supplies, making it impossible to provide necessary minimum health and medical services for the people including the poor.

As of 1996, Suriname had nine hospitals, among which seven were national hospitals and two were private hospitals. Three of the seven national hospitals are located inland and of a small scale. The national hospitals cover about 80% of the country's population.

Suriname has a national health network system composed of nine health centers, 29 clinics and 45 auxiliary health posts, under the control of the Ministry of Health. According to statistical data of the ministry, all the hospitals under its control, except for New Nickerie Hospital totally remodeled with a loan from IDB (Inter-American Development Bank), were constructed and equipped more than 30 years ago. The ministry announced a program for improving health and medical services in 1992, as an urgent measure in the field of health and medical care. The program contained the "strengthening of hospital management" in accordance with the Structural Adjustment Program, the "rehabilitation and replacement of superannuated facilities and equipment," and a "basic plan for improving health and medical technologies" for developing human resources. The ministry especially proposed that the rehabilitation and replacement of facilities and equipment be carried out immediately for The Academic Hospital of Paramaribo.

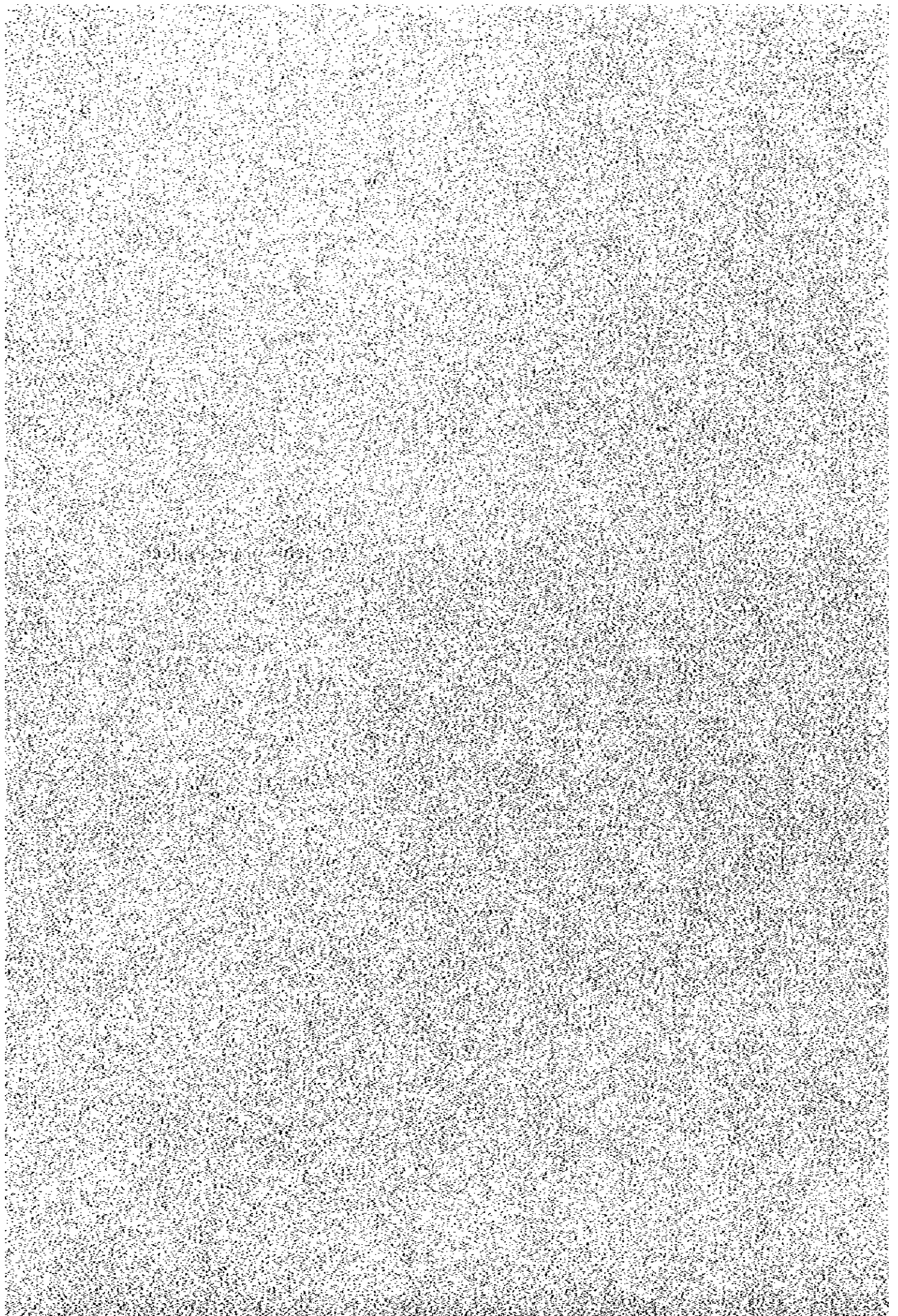
The Government of Suriname, placing importance on economic stabilization and antipoverty policy in its Structural Adjustment Program, has been making efforts to improve health and sanitation. The government, however, has to promote economic stabilization mainly by reducing accumulated external debts and budget deficits, and consequently the rate of national budget appropriated to the field of health and medical care is kept low. This impedes the sufficient replacement and operation of superannuated medical facilities and equipment, making it difficult, as a result, to maintain basic medical activities.

In the health and medical care system, The Academic Hospital of Paramaribo plays a leading role among the medical institutions in Suriname, as the country's top referral hospital. Doctors of these hospitals have certain levels of technologies acquired from academic and clinical experience in the Netherlands, but they cannot perform satisfactory medical activities because of the considerable superannuation and shortages of medical equipment.

Medical examinations are carried out for finding hypertension, diseases in cerebral blood vessels, malignant tumors, perinatal diseases, diseases in digestive organs, pneumonia, cold, etc. Examinations are also conducted for victims of accidents and homicide. Victims of traffic accidents are rapidly increasing in the Paramaribo metropolitan area due to unsatisfactory infrastructure. According to data of the hospital, 2,626 emergency patients (victims of traffic accidents) were accepted in the hospital in 1994 and about 3,000 in 1995. It is urgently necessary for the hospital to provide sufficient medical examination and treatment for thus increasing patients, by totally improving the present equipment. Although repairs are made on superannuated facilities and equipment, economic difficulties as mentioned above prevent the Ministry of Health from replacing medical equipment by its own efforts.

The Government of Suriname formulated, in its program made public in 1992 for improving health and medical care, a plan for the rehabilitation of medical equipment in The Academic Hospital of Paramaribo, the country's top referral hospital, giving priority to the raising of the qualitative and quantitative standards of medical services. In February 1995, the government formulated a project for the improvement of medical equipment in the hospital, and requested grant aid cooperation from Japan for the project's implementation.

Chapter 2
Contents of the Project



Chapter 2 Contents of the Project

2-1 Objectives of the Project

The Government of the Republic of Suriname has been making efforts to promote incentive for medical workers and improve medical services, with a view to providing equal medical services for the people both urban and rural. These efforts have been promoted in its national plan, under WHO's slogan of "Health for All by the Year of 2000." The government plans to improve health and medical services, by giving priority to the strengthening of participatory health systems in rural regions, the formulation of cost reduction plans, the formulation of a program for poor people and displaced people, improvement of medical workers' skill, the adjustment of budgetary procedures, and the strengthening of the health and medical information system.

The Ministry of Health has formulated a plan to improve health and medical services, based on the national plan, as an urgent measure in this field. The ministry has been promoting the strengthening of hospital management, repairs on and replacement of superannuated facilities and equipment, and the establishment of a foundation for health and medical technologies.

In Paramaribo Academic Hospital, which was established in 1966, many of its equipment have been superannuated because of not only an insufficient appropriation for rehabilitating/replacing them but also inadequate management of them. These equipment, whose working has been greatly lowered, impede satisfactory medical examination and treatment. The ministry places the highest priority on the project for providing facilities and equipment for Paramaribo Academic Hospital, which plays the role of the leading referral and educational hospital in the health and medical service system of the Republic of Suriname, with a view to raising the overall level of medical services in the country. Health and medical appropriations are, however, not an exception in that they are subjected to the government's structural adjustment policy. In the circumstances, it is difficult for the government to rehabilitate and replace superannuated medical equipment of Paramaribo Academic Hospital.

The Project is aimed at improving medical services for rural people and people in the lower brackets of income and strengthening the public medical service system, through replacing superannuated equipment in Paramaribo Academic Hospital and thereby improving its diagnostic functions, with a view to raising levels of medical services for rural people.

The Project is aimed at the recovery and restrengthening of the hospital functions, through Japan's cooperation in the provision of equipment in response to the request from the Government of the Republic of Suriname. The Project aims at the repairing and replacement of superannuated facilities and equipment in Paramaribo Academic Hospital, in line with the Structural Adjustment Plan promoted by the Surinamese government. The Project can become a support for the government to achieve goals of its policy on health and medical services. It is concluded that all the requested equipment are minimum ones necessary for Paramaribo Academic Hospital, as a general and educational hospital, in providing effective medical services.

2-2 Basic Concept of the Project

[1] Cooperation Policy

The requested pieces of equipment are indispensable ones for improved medical services provided by The Academic Hospital of Paramaribo, the target of the project. Most of them are those pieces of equipment which are necessary for providing satisfactory medical services for the people in the region, those which are supplies for deficiencies, and those which are replacements of superannuated or disabled ones. The requested pieces of equipment include medical equipment indispensable in medical examination and treatment, an oxygen plant for supporting medical

examinations and treatment, electricity generators for an emergency, and an incinerator. The provision of these is reasonable, because they are suitable in the present conditions, and for the technical levels, in the target hospital. It is, however, necessary to adjust the numbers of pieces of equipment to be provided, as the same pieces of equipment are sometimes requested for one and the same department and some pieces of equipment are not suitable in view of the present conditions of medical examination and treatment in the hospital.

The Government of Japan, recognizing the urgency and priority of the project's implementation, has decided to answer the request for those pieces of equipment for which the Government of Suriname is able to bear operation and maintenance costs.

The study results show that the basic concept of the project is the provision of medical services for the people in the region, by providing medical equipment suitable for the present technical levels of The Academic Hospital of Paramaribo in the Republic of Suriname.

The cooperation policy is, therefore, the choice of pieces of equipment more effective in medical examination and treatment in The Academic Hospital of Paramaribo, with the natural environment and social conditions in the country and the present conditions in the hospital being taken into consideration.

Based on the above-mentioned considerations, a basic policy has been formulated as follows. 1. The Project shall be closely connected with, and complement, improvement plans being promoted in the health and medical services sector of the Republic of Suriname. 2. The Project does not aim at advanced medical services but those of a basic level needed in the country. 3. equipment to be provided should be those which can be operated and managed by Surinamese own funds, human resources and technologies. 4. Beneficiaries shall be common people including the lower brackets of income, and the number of beneficiaries shall be large. 5. Priority is given to the provision of diagnostic equipment which are necessary and effective for medical services. 6. Places for installation should be secured and equipped with necessary facilities. 7. equipment whose provision has been finished, or is planned, by other donors or international organizations shall be excluded. 8. The Project shall be that which can be implemented in Japan's grant aid cooperation system.

[2] Confirmation of the Contents of the Request

The equipment requested by the Government of the Republic of Suriname are necessary ones for medical services provided by Paramaribo Academic Hospital, which is the leading referral hospital playing an important role in the health and medical service system of the country. Details of these requested equipment are described below for each department, together with conditions of existing ones, based on the field survey results.

1. Anesthesiology

The Anesthesiology Department is in charge of six operating rooms and one recovery room. The requested equipment are used in these rooms. Most of the existing pieces of equipment, whose superannuation is considerable, do not work satisfactorily. The requested pieces of equipment are indispensable in the administration of anesthesia by anesthetists and assistant anesthetists (usually well-trained nurses), the management of patients during surgical operations, and postoperative care in the recovery room.

Main pieces of equipment are rhino-laryngofiberscopes, patient monitors, a defibrillator,

general anesthesia apparatuses with ventilators, and ventilators.

2. Cardiology

Equipment requested for The Intensive Care Unit (ICU) the Cardiology Department, and the ward include those which are necessary in diagnosis of heart cases and monitoring patients' conditions. The ICU with nine beds is newly established next to the examination division of the department.

Main equipment include a central monitoring system, bedside monitors (for nine beds) and a cardiovascular application version color Doppler echocardiography.

3. Dermatology

Equipment requested for the Dermatology Department include those which are used in examination and treatment of skin diseases and venereal diseases in three diagnosis and treatment rooms which outpatients visit and the department's small pathological laboratory.

Main equipment include small steel instruments such as Metzenbaum scissors, needle holders and rectal specula, an examining table for gynecology, a microscope for finding venereal diseases, a solid-state electrosurgical unit, and a cryosurgery system.

4. Dietetics

A common weighing scale is provided, for health management for the inpatients.

5. Emergency Room

The hospital's Emergency Department is the only facilities that provide medical services on a 24-hour basis in the country. The department now has only three ambulances for first aid and lifesaving. The facilities include five diagnosis and treatment rooms, one gypsum room, two operating rooms and one monitoring room (with ten beds) for emergency patients. Insufficient equipment makes it difficult to meet the needs of emergency patients. Especially the oxygen supply system is inadequate for saving the lives of patients hovering between life and death, and there is not a piece of equipment in the two operating rooms. This makes surgical operations impossible in an emergency during the nighttime, sometimes resulting in the loss of precious lives.

Main equipment requested for the department include sphygmomanometers, electroencephalographs, fetal monitors, an instrument sterilizer and treatment tables. It will be necessary to provide each of the operating rooms with sufficient equipment.

6. E.N.T.

Equipment requested for this department are very basic ones necessary in the examination and treatment of the ear, nose and throat. They are classified into those equipment which are used for examinations for outpatients and those which are used in the operating room.

Main equipment include Lempert head mirrors, a Zollner tympanoplasty instrument set and a bronchoscope.

7. Gynecology

Equipment requested for this department are those which are used in two delivery rooms, the treatment room and the operating room, which are located in the fourth floor of the central building. Superannuation of the existing equipment is considerable, and especially it is difficult to fasten a patient on the delivery table so that her posture will not be changed. The request places importance on gynecological cryosurgery, hysterectomy, fetus monitoring and safe deliveries.

Main equipment include a stereo colposcope, a cryosurgery system, delivery tables, fetal actocardiographs, a laparoscope set, and a gynecological endoscopic TV system.

8. Intensive Care Unit (ICU)

The existing ICU is located in the end of the second floor of the main building, occupying a very small space with only five beds. This section has to be kept clean, as a matter of course, but facilities are very dirty seemingly because of inadequate management. The hospital authorities plan to make repairs on the existing facilities and provide nine beds in the ICU by relocating it to a place adjacent to the Cardiology Department. The content of this work is to reform with paint on the inner wall of room for nine beds used until now as the ward of the Ophthalmology. Equipment requested for the ICU are installed after the completion of hospital.

Main equipment to be provided are those which are necessary in the new ICU, namely, a defibrillator, beds for ICU patients, a patient monitoring system, steam-type bedpan flushing and sanitizing equipment, etc.

9. Internal Medicine

The requested equipment are those which are used in medical examination, analysis and treatment for outpatients and inpatients, and health management for patients, in the internal examination room for outpatients and in the Internal Department in the main building. The ward is now equipped only with superannuated weighing scales and a few medical instruments. The equipment are classified into those which are necessary in basic diagnosis and treatment in the ward and those which are used in image diagnosis for obtaining a more accurate understanding of patients' conditions. These equipment are effective for the doctors of the hospital in making good use of their clinical experiences acquired in the Netherlands or other European countries.

Main equipment include basic ones such as measuring rods and weighing scales, autspirometers, an electrocardiograph, respiratory ventilators, an endoscopic system including gastrointestinal, large intestinal and bronchial fiberscopes, and an echo apparatus.

10. Clinical Laboratory

In the Clinical Laboratory, being located in the second floor of the central building, general clinical examinations are conducted for outpatients and inpatients, except pathological examinations (pathological examinations are performed exclusively in another building). These examinations include urinalysis, blood testing, biochemical examinations for quantitative analysis of blood, and bacteriological analysis of blood, cerebrospinal fluid, urine, sputa and body wastes. As most of the existing equipment were purchased secondhand about 15 years ago at the hospital's own expense, it is difficult to obtain spare parts for repairs. They are left, therefore, as they have gone wrong. Repairs are sometimes made, by using parts detached from damaged, similar equipment, but equipment repaired in this way seldom work well, impeding everyday activities.

There is no problem in the operation of equipment, as the personnel, who have received training in the United States, the Netherlands, or other countries, are used to operating equipment automated to a certain extent, with technologies introduced from these countries. The requested equipment are testing equipment and automatic analyzing equipment, which are indispensable for the above-mentioned examinations and analyses in a 400-bed hospital.

Main equipment include basic ones such as microscopes, water baths and differential leucocyte counters, blood gas analyzers, electrolyte analyzers and automatic clinical chemistry analyzers.

11. Medical Registration

Although there is an extension network within the hospital, the number of extension telephones is insufficient for communication between members of the medical staff. This poses a problem in correspondence in an emergency. In addition, it is pointed out that it takes too much time in keeping an ever increasing number of patient's charts and finding charts of patients who visited the hospital in

the past.

The department is in charge of the office work of all departments of the hospital, which includes the management of patient's charts, the accounting of medical service, and plans to promote medical services.

Main equipment include a Dictaphone, a dictation recorder for stenography and a microfilm apparatus.

12. Neurosurgery

The doctors of this department are now receiving training in the Netherlands. A doctor from the Netherlands participates in examination and treatment for about one month in the hospital once in every three months. According to the department's data, 88 neurosurgical operations were carried out in 1993, 40 in 1994, and 64 in 1995. Although the number of neurosurgical operations is not large, Equipment are requested to be suitable for the present situation.

Main equipment include surgical forceps necessary in cerebral oncotomy and cerebral aneurysm clipping in neurosurgical craniotomy, and in subdural hematoma removal, and microsurgery forceps and air pressure skull operating sets.

13. Neurology

The electroencephalograph in the Outpatient Department, which was purchased more than 20 years ago, has gone wrong and does not work at all. The importance of electroencephalography for outpatients and inpatients is great, and Surinamese doctors who have received training in the Netherlands or other European countries are active in this department.

Main equipment include an electroencephalograph (21-ch), an electroencephalograph (6-ch), an evoked potential measuring system, and an EMG.

14. Oral & Maxilla Facial Surgery

This department is located in a very small room beside the Emergency Department. Superannuation of equipment is considerable, and the chair unit is so old that it is difficult to fix patients' postures.

15. Operating Room

The Central Operating Room is located in the third floor of the central building and composed of four large operating rooms and two small operating rooms. As mentioned earlier in the section of anesthesiology, there is the Central Sterilizing Supply Department (CSSD) in the semi-clean zone opposite to the recovery room across the corridor.

It is needless to say that sterilization plays a very important role in medical services. The CSSD is in a serious situation, because only one of its high pressure steam sterilizers is now in operation, being repaired with parts detached from the other damaged sterilizers.

The equipment in the operating rooms are considerably old, as those in the CSSD, and surgical operations are carried out with difficulty. The scrub unit in the operating room is especially in bad condition. The staff wash their hands with soap in tap water. This is very unsanitary, and improvement measures need to be taken at once, for the purpose of preventing in-hospital pollution.

Main equipment include high pressure steam sterilizers, an examination and treatment system including cysto-urethroscope sets, a universal operating table, an operating light and a laparoscope set.

16. Ophthalmology

Activities in this department include ophthalmological examination and treatment for outpatients and ophthalmological operations in the operating room. The ophthalmology ward is situated beside the outpatient ward building, independently of the main ward building. The treatment room is equipped with an ophthalmological laser treatment apparatus, though old-fashioned, for advanced treatment. However, the fact that it is impossible to make repairs on this apparatus because of lack of spare parts

prevents this kind of treatment from being carried out in the hospital.

Main equipment include an ophthalmological echo scan and aspiration/irrigation equipment for cataract. Precision steel instruments to be provided in this department include scissors, needle holders, and forceps such as hook & probes.

17. Orthopedics

Forceps for orthopedic operations, equipment for operations of bones of arms and legs, and an image diagnosis/treatment apparatus are provided, for the purpose of conducting efficient and proper orthopedic treatment for a number of patients. Main equipment include solid-state bipolar coagulator units, a skull drilling device, an air pressure surgical operation set, an arthroscopic set with a camera and a monitor and a fluoroscopy apparatus.

18. Pathological Laboratory

This laboratory is used for not only in-hospital pathological examinations and analysis of pathological specimens difficult to judge in other medical institutions in the country but also medicolegal examinations. Pathological autopsies are conducted in the laboratory for identifying causes of death. The laboratory plays the role of a medicolegal and pathological examination center, under cooperation with the judicial department of the national government.

Main equipment include a complete microscope system with a camera and a TV set, dead body refrigerators, a dissecting table, slide stainers, a shaker for tissue fixation, and dissecting instruments such as dissecting scissors, cartilage knives and an amputating bone saw.

19. Pediatrics

The Pediatrics Ward is located in an independent building in front of the main ward building, with 68 beds including eight for the NICU (neonatal intensive care unit).

Pediatricians, having left the country during the period of military administration, are returning to Suriname, as the implementation of the country's Structural Adjustment Plan was started. Although the hospital has no pediatricians now, a monthly average of 20 children are hospitalized and receive treatment in the Pediatrics Ward. The hospital authorities are now inviting experienced pediatricians who have great leadership, in order to cope with the situation.

Main equipment include infant incubators, a portable infant incubator, bilirubin meters, a neonatal monitor and infant ventilators.

20. Pharmacy

Medicines (tablets, powder, liquid medicine and ointment) were once manufactured in the dispensary on a small scale, but damaged and superannuated equipment resulted in the suspension of medicine manufacturing. More than ten pharmacists including those who are from the Netherlands under private cooperation now take charge of preparing prescriptions by hand.

The expansion of the dispensary has been approved by the hospital authorities, for the purpose of resuming medicine manufacturing on a small scale, and the hospital is scheduled to be completed in May, 1997.

Main equipment include balances, a rotor stator mixer, a high pressure steam sterilizer, a sealing apparatus, liquid dispensers, medical refrigerators and a drying oven.

21. Physiotherapy

In this department, examinations and treatment are conducted for outpatients and inpatients. Part of equipment are installed in the Ward Department. The requested equipment are minimums necessary for promoting rehabilitation for patients. The examination room is now under remodeling, which is completed in May 1997, in accordance with the repairing program for the hospital.

Main pieces of equipment include a whirlpool bath for arms and legs, bicycle exercisers, a quadriceps table, a lower limb extension flexion exercise chair, low frequency therapy apparatus,

shortwave diathermy equipment, and a stress test system.

22. Plastic and Reconstructive Surgery

Although the requested equipment, being used in an operating room, are very basic ones for plastic and reconstructive surgery, some of them can be shared with other departments.

Main equipment include a microsurgical set, tourniquet manchette for arms, tourniquet manchette for legs, a binocular microscope for plastic surgery, and a universal operating table.

23. Radiology

The Radiology Department is in the first floor of the central building and in an independent building in the courtyard. There are five rooms for general radiography, one room for fluoroscopy, one room for mammography, one room for radiographic diagnosis, and one room for angiography. The present conditions of the existing apparatuses are as follows. They show that radiographic examinations for outpatients and inpatients are very difficult. -General radiography apparatuses Two of five apparatuses are in operation, though with difficulty. -Fluoroscopy apparatus It does not work at all, because of total damage. -Mammography apparatus It works normally. -Tomography apparatus It does not produce tomograms of good quality, because of superannuation. -Angiography apparatus It does not work at all, because of total damage.

Requested main apparatuses include a general radiography apparatus, a fluoroscopy apparatus, a tomography apparatus, X-ray TV equipment, mobile X-ray units and an X-ray film processor.

24. Rehabilitation

The Rehabilitation Department, being located to the center of a one-story building, is a two or three minutes' car ride from the main building. The department is an institution affiliated to the hospital. In the facilities, there is a school for physically disabled children, who receive school education and physical training for rehabilitation in accordance with a program formulated for each child.

The requested apparatuses include an electrocardiograph, an electro-hydraulic lift trolley, a paraffin bath, shoulder wheels, a shortwave diathermy unit, an ultrasound therapy unit and a goniometer set.

25. Surgery

The requested apparatuses are surgical instrument sets, surgical instrument sets for infants, gastrectomy instrument sets, peripheral vascular clamps and small steel instruments used in surgery.

26. Urology

The requested apparatuses are basic ones necessary in urological examination and treatment.

Main apparatuses include a bougie set, a cystometric apparatus and a cystoscope-urethroscope.

27. Ward

The requested apparatuses are those which are insufficient in the nurse station in each floor of the main building, in nursing and health management for inpatients.

Main apparatuses include Lister bandage scissors, sphygmomanometers, weighing scales, four-caster walkers and backrests with hair shampooing basins.

28. Maintenance Department

The Maintenance Department is located beside the Pathology Laboratory in the back of the hospital's premises. The department is divided into five special fields, namely, (1) Woodwork Repairing Division, (2) Mechanical Repairs Division, (3) Electrical Repairs Division, (4) Medical Electronic Repairs Division, and (5) Painting Division. These divisions are in charge of the maintenance of the buildings and facilities, as well as apparatuses and instruments.

Assistance in the provision of repairing tools is planned by a private organization in the Netherlands, but the plan concerns only repairing tools, and does not include testing apparatuses and measuring instruments necessary in repairs on medical apparatuses. Human resources dispatched from the Government of the Netherlands under a technical cooperation project are promoting the awareness of the importance of maintenance, but equipment is excluded.

Main apparatuses include oscilloscopes, a defibrillator tester, an electric surgical apparatus tester, a multipurpose measuring instrument and a variable apparatus.

29. Nurse Training Center

The Nurse Training Center is located in an independent one-story building in the courtyard of the hospital. Training is given regularly there to nearly 25 young student nurses.

Main apparatuses include nursing dolls, a skeleton, overhead projectors, slide projectors, a TV/video set and a personal computer.

30. Others

In promoting stability of medical examination and hospital functions, it is necessary to improve communication among the medical staff, strengthen the infrastructure, and improve the efficiency of administration and office work.

Main apparatuses include a wireless communication system, an ambulance, a small-sized truck, electricity generators for emergencies, an oxygen plant, an incinerator, copying machines, personal computers and printers.

Most of the existing apparatuses in the hospital were purchased 15 years to 25 years ago. They are not in satisfactory condition for use because of superannuation, and consequently accuracy cannot be expected from them. Moreover, some apparatuses are those which were used in field hospitals during the Cold War. Most of the existing apparatuses have gone wrong, have been damaged or out of order. As these apparatuses are very old, it is difficult to obtain spare parts for repairs on them. This makes it impossible to take measures when they are in trouble. Those apparatuses which are now serviceable have undergone repairs with parts detached from other similar apparatuses.

In this situation, the hospital has received no assistance from other countries or international organizations in the provision of new apparatuses. Most of the existing ones are superannuated and not serviceable, as a result.

The requested apparatuses are intended for sufficiently equipping the hospital. They include new apparatuses which have become necessary for meeting the people's needs for medical services, with the progress of medical technologies, those apparatuses which are insufficient in number, and those apparatuses which need replacement because of superannuation or damage.

The requested apparatuses are basic ones necessary in diagnosis and treatment, and suitable in the present conditions in the hospital, in view of technical levels of medical services provided there. It is, however, necessary to adjust numbers of apparatuses/instruments. Stethoscopes, for example, are mostly carried by doctors. Some apparatuses are sometimes requested from different departments, some apparatuses are the same as those whose provision is planned by the Government of the Netherlands, while others are too large or small in number, in view of the present conditions of medical services provided in the hospital.

Some apparatuses which are not included in the request are considered necessary, by the Study Team, for the hospital fully displaying its functions, providing safe and stable health and medical services for the people of the Republic of Suriname.

Such apparatuses are mentioned below by department.

The below-mentioned apparatuses appearing in the original request have been deleted, after a close study of them, and discussions with and explanation to the Surinamese government. Reasons are mentioned below. These apparatuses are basic ones necessary in medical services in the hospital but require large-scale remodeling of hospital facilities in installing them, and advanced technologies, as well as large expenses for management and maintenance are needed.

-Angiograph

This apparatus, being used in radiographic examination of circulatory organs, requires clean operation in a clean zone. There is, however, no place suitable for installing it. Cardiosurgery and cerebral surgery, which require this apparatus, are not established in the hospital.

-Gamma camera

This apparatus is a diagnostic apparatus using a radioactive isotope. There is, however, no place suitable for installing it. There is no place for storing and managing radioactive isotopes and necessary peripheral apparatuses.

-Hemodialyzer

In view of the present standards of living of the people of the Republic of Suriname, hemodialysis may become a means of treatment only for rich people. In addition, it needs a large expense for obtaining blood circuits including expendable follow fibers. If a hemodialyzer were to be installed, both the hospital and patients have to bear a very large expense.

[Study on Requested Equipment]

For deleting unnecessary equipment of the requested ones and adding or reducing numbers of requested equipment, a study has been made as follows. In this study on requested equipment, the equipment which are priority A and B evaluated by Suriname side are intended for the Scope of work. Figures in parentheses on the left of the pages refer to item numbers of requested equipment.

(1) Anesthesiology

(Conditions for Study)

The Anesthesiology Department is in charge of six operating rooms (four large operating rooms and two small operating rooms) in the clean zone and the three-bed recovery room in the semi-clean zone. Appropriate numbers of apparatuses have been studied, based on these conditions.

-[1-4] Recovery Stretcher

Although eight recovery stretchers have been requested, three will be provided, in view of the department's space for examination/treatment and the spaces of the six operating rooms.

-[1-10] Rhino-laryngofiberscope with Light Supply

Although two rhino-laryngofiberscopes have been requested, one will be provided, in view of the frequency in the use of it in the three-bed recovery room.

-[1-11] Patient Monitor

Four patient monitors have been requested, but three will be provided for patients accepted in the three-bed recovery room.

-[1-13] Pulse Oximeter

Six pulse oximeters have been requested, but three will be provided for the same reason as mentioned above.

-[1-17] Laryngoscope with Fiber Optics Illumination

Six laryngoscopes have been requested, but three will be provided for the same reason as mentioned

above.

-[1-24] Infant Stretcher

Two infant stretchers have been requested, but one will be provided, with the scale of this department, the areas of six operating rooms and the ratio between adult patients and infant patients being taken into consideration.

(2) Cardiology

(Conditions for Study)

The Cardiology Department takes charge of cardiology, the ICU and the cardiology ward. The relocation of the ICU from the small space in the second floor of the main building to a larger space adjacent to the Cardiology Department is planned, with nine beds being provided. The relocation work is now under way and completed in March 1997. Appropriate numbers of apparatuses have been studied, based on these conditions.

-[2-8] Stress Test System

It was concluded in a discussion with the doctors in charge, during the field survey, that a similar system requested by another department would be served for common use, because this expensive apparatus required analytic capability of a very high level.

-[2-10] ECG Analysis System with 3-4 recorder

The request for this apparatus is deleted, because medical doctors can analyse the ECG graph by general without this apparatus.

-[2-11] ECG analyzer

The request for this apparatus is rejected for the same reason as mentioned under Item Number [2-10].

(3) Dermatology

(Conditions for Study)

A study is made on numbers of equipment to be used in three dermatological examination/treatment rooms and the small pathological laboratory for the Dermatology Department.

-[3-2] Treatment Table

Although four treatment tables have been requested, three will be provided, because the department has three examination/treatment rooms.

-[3-6] Medicine Cabinet

One medicine cabinet will be provided for common use in the three examination/treatment rooms of this department.

-[3-26] Storage Cabinet

One storage cabinet will be provided for common use in the three examination/treatment rooms of this department.

-[3-28] Cloth Basket

No cloth basket will be provided because they can be procured in the country or purchased at the hospital's expense.

-[3-29] Chair

No chairs will be provided because they can be procured in the country or purchased at the hospital's expense.

-[3-34] Doctor's Frock

The request for doctor's frocks was rejected because these, being locally available, could be purchased at the hospital's own expense.

-[3-35] Barrier Uniform

The request for barrier uniforms was rejected for the same reason as mentioned above.

-[3-37] Solid-state Electrosurgical Unit

Although two units have been requested, one will be provided for common use, in view of the frequency of its use.

-[3-38] Electrode

Electrodes are a component of an electrosurgical apparatus.

The request for electrodes under this item number is rejected, and they will be provided, under a different item number, as spare parts for the apparatus.

-[3-42] Hot Air Sterilizer

Although two hot air sterilizers have been requested, one will be provided, because temperature becomes very high in the narrow room, and with a view to promoting the sharing of it among departments and efficiently using the space of the room.

(4) Dietetics

No studies are necessary, because there is no problem in the requests from this department.

(5) Emergency Room

(Conditions for Study)

The Emergency Room is the only facilities that accept emergency patients on a 24-hour basis in the Republic of Suriname.

This department is composed of five examination and treatment rooms, one gypsum room, two operating rooms, and one monitoring room for monitoring emergency patients' conditions. The department accepts an annual average of about 35,000 patients, and about four patients are rough there in an hour. About 10% of these patients are victims of traffic accidents. In other words, about 10 people slightly or seriously injured in traffic accidents are accepted in the Emergency Room during a day. As the operating rooms of the department have no equipment, treatment is administered on a treatment table of another department.

-[5-4] Electroencephalograph

The request for this apparatus is rejected, because this is not used in a emergency case.

-[5-5] Electroencephalograph

The request for this apparatus was deleted in a discussion with the doctors in charge, during the field survey, because the same apparatus was requested under a different item number.

-[5-11] Shower commode chair

This apparatus is used for washing dirt off emergency patients. Two shower commode chairs are sufficient, in view of the space of this department.

-[5-21] Universal Operating Table

-[5-22] Anesthesia Apparatus

-[5-23] Patient Monitor

-[5-24] Instrument Table

-[5-25] Mayo's Instrument table

-[5-26] Instrument Cabinet

-[5-27] Medicine cabinet

These apparatuses are intended for the recovery of the functions of the two operating rooms, which are not serviceable now. Two will be provided, respectively, for keeping medicines and consumable supplies used in a surgical operation.

-[5-28] Operating Light

-[5-29] Electrosurgical Unit

-[5-30] Defibrillator

One will be provided, respectively, for emergent lifesaving.

-[5-31] Surgical operating Instrument Set for adults

Four sets will be provided, in consideration of the number of injured people brought to the Emergency Room.

-[5-32] Surgical Operating Instrument Set for children

Two sets will be provided for the same reason as mentioned above.

-[5-33] Small Operating Instrument Set

Six sets will be provided for the same reason as mentioned above.

(6) E.N.T.

(Conditions for Study)

The requested apparatuses are those which are necessary in the department's two outpatient examination/treatment rooms and the operating room.

-[6-5] Platinum prosthesis

The request for this equipment was rejected, because it is classified as a medical, consumable supply.

(7) Gynecology

(Conditions for Study)

The requested apparatuses are those which are necessary in the department's two delivery rooms, two treatment rooms and operating room in the fourth floor of the main building.

-[7-3] Cryosurgery System

The request for this system was rejected, because the same kind of system was requested for the department under a different item number.

-[7-9] Cusco's Varginal Speculum

Although 36 pc of this equipmmt have been request,16 will be provided, because 16 are sufficient in this Department,in view of the Frequency of the use of the equipment.

-[7-15] Laparoscope for Cholecystectomy Set

-[7-16] Surgical CO2 Insufflator

-[7-17] Laparoscope Set

-[7-18] Endoscopic TV System

-[7-19] Universal Xenon Light Source for Endoscopes

The requested for above equipment are rejected,because above mentioned equipment should be co-used in the operating room and internal medicine department.

(8) Intensive Care Unit

(Conditions for Study)

The Intensive Care Unit is relocated and provided with nine beds, for safer intensive care. It is necessary to be aware of the possibility that this department will play a more important role in the management of cardiological patients.

-[8-1] Defibrillator

Although two defibrillators have been requested, one will be provided, because one is sufficient in an ICU with nine beds, in view of the frequency of the use of the apparatus.

-[8-2] Bedside Monitor

The request for this apparatus is deleted, because there is a request from the Cardiology Department for a central monitor set for the new ICU.

-[8-3] Patient Monitor System

The request for this apparatus is deleted for the same reason as mentioned above.

-[8-4] Measuring Rod

The request for a measuring rod is deleted, because it is not used in this department.

-[8-9] Digital Cardiac Telemetry System

The request for this system is rejected, because there is a request from the Cardiology Department for equipment necessary for monitoring biological conditions of patients in the nine-bed ICU.

-[8-11] Infusion Pump

Although eight infusion pumps have been requested, nine will be provided for nine beds.

-[8-14] Hot Plate

The request for this apparatus was deleted in a discussion with the doctors in charge, during the field survey, because it is not necessarily used in medical care.

-[8-15] Ventilator for Adults

-[8-16] Ventilator for Infants

There are now two ventilators in operation, but the lowering of their functions is considerable 7 ventilators for adults and 2 for infants will be provided.

(9) Internal Medicine

(Conditions for Study)

The Internal Department is situated in the internal ward (75 beds) in the second floor, and in the special ward (29 beds) in the sixth floor, of the main building. In each story, there are two nurse stations and two examination and treatment rooms for inpatients. Doctors and nurses are in charge of examination and nursing, with these rooms as key stations.

-[9-1] Automatic Weighing Scale

Although eight automatic weighing scales have been requested, four will be provided, because eight is too many for the scale of this department.

-[9-2] Examining Couch

Although six examining couches have been requested, four will be provided for the same reason as mentioned above.

-[9-3] X-ray Film Illuminator

Although six X-ray film illuminators have been requested, four will be provided for the same reason as mentioned above.

-[9-6] Sphygmomanometer, mercurial A

Fifteen sphygmomanometers of this type have been requested, and two will be provided in each of the nurse stations and the examination/treatment rooms, totaling to eight.

-[9-7] Sphygmomanometer, mercurial B

Ten sphygmomanometers of this type have been requested, and eight will be provided in the same manner as mentioned above.

-[9-8] Sphygmomanometer, aneroid B

The request for this apparatus was deleted in a discussion with the doctors in charge, during the field survey, because aneroid sphygmomanometers produce less accurate results than mercurial sphygmomanometers and are not so strong as those of the latter type.

-[9-9] Diagnostic Set

Although six sets have been requested, eight will be provided, because two are necessary in each examination and treatment room.

-[9-12] Percussion Hammer

Three percussion hammers will be provided in each of the nurse stations and the examination/treatment rooms, totaling to 12, though 10 have been requested.

-[9-13] Clinical Thermometer

The request for clinical thermometers, which are not used in a large quantity at a time, is deleted, because they can be purchased at the hospital's expense.

-[9-15] Laryngoscope with Fiber Optics Illumination

Although five laryngoscopes have been requested, four will be provided: one for each of the

nurse stations and examination / treatment rooms.

-[9-27] Electrical Peak Flow Meter

Although five electrical peak flow meters have been requested, four will be provided, for the same reason as mentioned above.

-[9-28] Handy Spirometer

The request for handy spirometers was deleted in a discussion with the doctors in charge, during the field survey, because they were so small and handy that they might be easily lost.

-[9-30] Autospirrometer

Although two autospirrometers have been requested, four will be provided, for the reason that the installation of one autospirrometer in each examination/treatment room in the Internal medicine Department lightens loads on patients, and it is better for the men's ward and the women's ward to be independently provided with this apparatus.

-[9-32] Pulmonary Function Test system

The request for this apparatus, which is expensive, is rejected, because there is no established technical backup systems for it in the Republic of Suriname, and pulmonary functions can be measured with an autospirrometer which is provided under Item Number... [9-30]. There is little urgent needs for this apparatus, either.

-[9-40] Endoscopic Suction Unit

Although three endoscopic suction units have been requested, two will be provided, for adjusting the number of units to that of endoscopic systems.

-[9-43] Laparoscope Set

It is a matter of common knowledge that laparoscopic biopsies and operations are conducted in an operating room, which is a clean zone.

Similar apparatuses are included in the request from the Operating Room, under Item Numbers [15-30] to [15-32]. It is uneconomical, from the viewpoint of the management and maintenance of the apparatus, to conduct laparoscopic examinations in more than one place in the hospital. It is necessary that a centralized system be established as early as possible in the hospital, for the purpose of reducing total expenses as much as possible. For these reasons, the request for this apparatus is deleted.

-[9-44] Surgical CO2 Insufflator

This apparatus is a component of the above-mentioned laparoscope set. The request for it is rejected, for the same reason as mentioned above.

-[9-45] Automatic Gas Insufflator for Laparoscopes

The request for this apparatus is rejected for the same reason as mentioned above.

-[9-53] Hemostatic Catheter for Gastroenterology Purposes; Sengstaken

The request for this was deleted in a discussion with the doctors in charge, during the field survey, because it was an independent, medical consumable supply.

**-[9-54] Instruments for Gastroenterology Purposes;
Sclerosing Agent**

The request for this was deleted in a discussion with the doctors in charge, during the field

survey.

-[9-55] Dilator for Gastroenterology Purposes

The request for this was deleted, because the doctors in charge told, in the field survey, that it was unnecessary.

(10) Laboratory

(Conditions for Study)

In the Laboratory, the medical staff conduct general examinations, blood testing, biochemical analysis and bacteriological analysis, except pathological examinations. Superannuation is considerable among the existing apparatuses, and it is very difficult to ensure that accurate results will be obtained. It is urgently necessary to replace superannuated apparatuses, for the purpose of properly identifying conditions of patients, based on accurate examination results.

-[10-12] Fully Automated Electrophoresis System

The request for this apparatus is rejected, because Item number [10-9][10-10] Densitometer / Electrophoresis Apparatus are available for this kind of clinical tests without Automated Electrophoresis System.

-[10-14] Blood Gas Analyzer

One will be provided, with cost effectiveness being taken into account.

-[10-19] Isoelectrofocusing Electrophoresis

The request for this apparatus is rejected for the same reason as mentioned above item Number [10-12]

-[10-20] pH Meter

One will be provided, with cost effectiveness being taken into account.

-[10-23] electric analytical Balance

One will be provided, with cost effectiveness being taken into account.

-[10-24] Clinical Chemistry Analyzer

This apparatus is used in emergent chemical analysis.

The hospital has no clinical chemistry analyzers now, and two have been requested. Although the apparatus is necessary in not only emergent biochemical analysis during a surgical operation but also emergent examinations for inpatients whose conditions have suddenly changed and for emergency patients, one will be examinations are carried out less frequently than routine biochemical examinations.

-[10-25] Clinical chemistry analyzer

The request for this apparatus is rejected, because considering the condition of existing same kinds apparatus 2 units will be provided including the existing one..

-[10-34] High Pressure Steam Sterilizer

The three existing high pressure steam sterilizers are of the type operated with steam supplied from the central boiler. The central steam boiler of the existing sterilizers has gone wrong for several years, and it is as good as waste matter. Its piping is also damaged.

These conditions make it impossible to sterilize containers used in examination and waste produced in bacteriological analysis. Two high pressure steam sterilizers with built-in boilers will be therefore provided, for improving the situation and making everyday sterilization possible.

(11) Medical Registration

(Conditions for Study)

Apparatuses to be provided are chosen for substantiating examination/treatment services, with importance being laid on whether requested apparatuses are urgently necessary or not.

-[11-1] Dictaphone

The request for Dictaphones is rejected, because the reason that this apparatus is necessary in diagnosis and treatment is not clear. It is uncertain, either, if it is necessary in an emergency.

-[11-2] Transcribers Complete

The request for this apparatus is rejected, for the same reason as mentioned above.

-[11-3] Microfilm Apparatus Complete

This apparatus is used in storing and managing patient's charts. It is necessary, however, first to strengthen the present system of managing patient's charts. As urgent necessity of this apparatus was not found, the request was deleted.

-[11-4] Metal Storage Files

In the hospital, files are now stored in a file cabinet.

The request for metal storage files is rejected, because they can be purchased in the Republic of Suriname at the hospital's expense.

(12) Neurosurgery

(Conditions for Study)

There are no regular neurosurgeons now active in the hospital. Neurosurgical examinations and treatment are conducted by neurosurgeons from the Netherlands for one week per month. For this reason, no equipment are provided for this department.

A minimum of equipment necessary in neurosurgical operations (e.g., blood tumor removal) for emergency patients such as victims of traffic accidents are provided, as mentioned below, as part of equipment of the operating rooms.

-[12-22] Metzemaum scissors, straight 16 cm 2

-[12-23] Metzemaum scissors, straight 18 cm 2

-[12-24] Metzemaum scissors, curved 14 cm 2

-[12-25] Metzemaum scissors, curved 16 cm 2

-[12-26] Metzemaum scissors, curved 18 cm 2

-[12-27] Schede bone curette No. 1 1

-[12-28] Schede bone curette No. 2 1

-[12-29] Schede bone curette No. 3	1
-[12-30] Schede bone curette No. 4	1
-[12-31] Schede bone curette No. 5	1
-[12-32] Schede bone curette No. 6	1
-[12-33] Kocher retractor, two-sprong	2
-[12-34] Kocher retractor, three-sprong	2
-[12-35] Langenbeck retractor, large	2
-[12-36] Langenbeck retractor, medium	2
-[12-37] Langenbeck retractor, small	2
-[12-38] Air pressure skull operating set	1
-[12-41] Air pressureurgia operating set	1
-[12-42] Air pressureurgia operating set	1
-[12-44] Gas adjuster	1
-[12-47] Solid state bipolar coagulator unit	1
-[12-50] Neurosurgery instrument set	2
-[12-83] Microvascular surgical instrument set	1

(13) Neurology

(Conditions for Study)

In the Neurology Department, electroencephalographs were once used. Doctors trained in the Netherlands or other European countries are now active in the department. Such being the situation, there is no problem in the operation of apparatuses needed in the department. The requests have been studied, as the same apparatus is sometimes requested under a different item number.

-[13-1] Electroencephalograph

The request under this item number is deleted, because one electroencephalograph for a wide use is provided, in response to the request for three electroencephalographs for this department.

-[13-2] Electroencephalograph

The request for this apparatus was deleted in the same manner as mentioned above.

-[13-3] EEG-INK galvanometers, Code EMT-2PSP

Spare parts for the existing old electroencephalograph made by Siemens, Germany, are requested. It has been concluded that no spare parts are available for this old-fashioned apparatus, and spare

parts should be purchased at the hospital's expense. The request is, therefore, rejected.

(14) Oral & Maxilla Facial Surgery

(Conditions for Study)

The Oral & Maxilla Facial Surgery Department is located beside the Emergency Department, occupying a very small space. The hospital authorities have no plan to relocate this department to a more extensive area, despite their request for the variety of kinds and a large number of apparatuses for this department.

-[14-1] Chair Unit

As there is no space for installing two chair units as requested, one will be provided.

-[14-3] Vacuum Motor

One vacuum motor will be provided, as there is no space for installing two as requested.

-[14-4] Electric Bone Drill Unit

The request for this apparatus is rejected, because it is unnecessary in dental examination and treatment.

-[14-5] - [14-28]

The request for an X-ray processor, an M.R.W.S. wire, etc., is rejected, because there is no room for installing them.

(15) Operating Room

(Conditions for Study)

For equipping an operating room, one of the most important places of a hospital, it is necessary to carefully review technical levels in various surgical operations conducted there. The medical staff of Academic Hospital Paramaribo have techniques of satisfactory levels, as they either have clinical experiences in the Netherlands or other European countries or have received training under technical cooperation from these countries. The Central Sterilized Supply Department adjacent to the Operating Room is a very important section for always securing sterilization materials. The necessity of the provision of requested apparatuses is great.

[15-1] High Pressure Steam Sterilizer

[15-2] High Pressure Steam Sterilizer

One unit each will be provided, with cost effectiveness being taken into consideration.

-[15-4] Light Source Unit

This apparatus is closely related with other requested apparatuses for the Operating Room. Three light source units, as requested, are too many in view of the composition of the apparatus. One will be therefore provided.

-[15-24] Operating Table

One operating table has been requested for the Operating Room, but the existing one is so old that the posture of a patient cannot be fixed during a surgical operation.

Three more operating tables are provided in the Operating Room, by deleting the request from the Plastic and Reconstructive Surgery Department for three operating tables, which are to be used not in the operating room of the Plastic and Reconstructive Surgery Department but in the Operating Room. Such being the situation, four operating tables will be provided for the Operating Room, while the request from the Plastic and Reconstructive Surgery Department is rejected.

-[15-29] McLaughlin Plate

The request for McLaughlin plates is rejected, because they are an expendable article.

-[15-30] Automatic Gas Insufflator for Laparoscope

Although two automatic gas insufflators have been requested, one will be provided, because the number is not in accord with the composition of other laparoscope-related apparatuses.

-[15-34] Scrub Unit

Sterilized water is not available for the superannuated scrub units installed at the entrances of four Large Operating Rooms, and the medical staff wash their hands only with soap and tap water. This unusual situation may result in in-hospital infection among patients. Improvement is urgently necessary for securing cleanliness and preventing pollution during a surgical operation. For this purpose, it is necessary to install a scrub unit at the entrance of each of the four Operating Rooms.

-[15-35] Operating Microscope

The existing operating microscope is very old, and not serviceable because few spare parts are available. This apparatus is indispensable in ophthalmology, neurosurgery and plastic microsurgery. microscope will be provided in the Operating Room for common use with the Ophthalmology Department (which has made a request for the apparatus under Item Number [16- 50]) and the Plastic and Reconstructive Surgery

Department (which has made a request for the apparatus under Item Number [22-8]). The requests from the latter two departments are deleted.

-[15-36] C-arm X-ray Apparatus

The Operating Room is not equipped with a C-arm X-ray Apparatus, which is necessary in radiography of internal organs during a surgical operation. A request for this apparatus has been made also by the Orthopedics Department. It is more suitable for the apparatus to be used in the Operating Room than in the outpatient division of the Orthopedics Department. One C-arm X-ray apparatus will be therefore provided for the Operating Room, and the request for it from the Orthopedics Department is deleted.

(16) Ophthalmology

(Conditions for Study)

The Ophthalmology Department is located in the ophthalmology ward independent of the main building, and ophthalmological examinations and treatment are conducted there. The ophthalmologists are equipped with advanced technologies. A study has been made on the requested apparatuses, with this being taken into account.

Those apparatuses which are provided under assistance from other donor nations are deleted.

-[16-35] Trial Frame

Although six trial frames have been requested, four will be provided, as two are to be provided from the Netherlands.

-[16-44] Lasergecoate 3 Spiegel Goldman Contact Lenses

The request is rejected, because these are classified into expendable medical supplies.

-[16-48] Haay Streit slit lamp

Although three Haay Streit slit lamps have been requested, one will be provided, because two are to be provided from the Netherlands.

-[16-49] Trial lens set

The request for trial lens sets is deleted, because there is another request under Item Number [16-

34].

-[16-50] Microscope for Ophthalmological Microsurgery

The request is deleted, and an operating microscope will be provided in the Operating Room.

(17) Orthopedics

(Conditions for Study)

The requested apparatuses are those which are necessary in the examination/treatment rooms for outpatients and the operating room of the Orthopedics Department. The scale of the provision of apparatuses has been studied, on the basis of their purposes and places for installing them.

-[17-3] Weighing Scale

Although five weighing scales have been requested, one will be provided for common use, without providing one for each examination/treatment room.

-[17-6] Sture Wire

The request for this equipment is rejected, because this is classified into expendable medical supplies.

-[17-15] Skull Drilling Device

The request for this equipment is rejected, because the same equipment is sometime requested under a different item member.

-[17-16] Skull Drilling Device

The request for this equipment is rejected in the same manner as mentioned above.

-[17-23] Air Pressure Surgical Operating Set

The request for this equipment is rejected in the same manner as mentioned above.

-[17-26] Measuring Rod

Although five measuring rods have been requested, one will be provided for common use among the rooms.

-[17-27] Sitting Length Scale

Although five sitting length scales have been requested, one will be provided for common use among the rooms.

-[17-29] C-arm Fluoroscope

As mentioned earlier in the section of the Operating Room, the request for this apparatus from the Orthopedics Department is rejected.

-[17-31] Air Pressure Skull Operating Set

The request for this equipment is rejected in the same manner as mentioned in Item Number [17-15]

(18) Pathology Laboratory

(Conditions for Study)

In the Pathology Laboratory, not only general pathological examinations but also medicolegal examinations are conducted. Specimens for pathological examinations and autopsies are received in the laboratory from all over the country. As a building for temporarily storing dead bodies for autopsies has been completed, the staff of the laboratory are expected to become much busier.

-[18-6] Autopsy Table with Aspirator and Vacuum
As this apparatus is provided from the Netherlands, the request to the Japanese government is rejected.

-[18-8] Slide Stainer Machine
The request for this machine was deleted in a discussion with the doctors in charge, during the field survey.

-[18-17] Gypsum Cutter
The request for this apparatus was deleted in a discussion with the doctors in charge, during the field survey.

(19) Pediatrics

(Conditions for Study)

Although five measuring rods have been requested, one will be provided for common use in the examination/treatment room for orthopedic outpatients.

Although five scales have been requested, one will be provided for use in the same manner as mentioned above.

The Pediatrics Department, having 68 beds including eight NICU's, is capable of accepting a large number of patients. A study is made on those apparatuses which are necessary for pediatricians' activities.

The department has one regular pediatrician, and apparatuses which can be operated by the pediatrician will be provided.

-[19-1] Infant incubator	2
-[19-3] Portable infant incubator	1
-[19-4] Phototherapy unit	2
-[19-10] Bilirubin meter	1
-[19-12] Neonatal monitor	2
-[19-15] Infusion pump	2
-[19-16] Infant ventilator	2
-[19-21] Miller's laryngoscope set	1
-[19-22] Oxygen monitor	1

(20) Pharmacy

(Conditions for Study)

Remodeling work is planned for the Pharmacy, as well as for the Physiotherapy Department mentioned later, for the purpose of resuming small-scale medicine manufacturing (tablets, powder medicines, liquid medicines and ointment) in the Pharmacy. Drawings have already been prepared,

and remodeling work is completed by August 1997.

-[20-35] Steam sterilizer

The request for this apparatus is deleted, because a high pressure steam sterilizer is requested under Item Number [20-34].

-[20-36] Autoclave

The request for this apparatus is deleted, for the same reason as mentioned above.

-[20-37] High pressure steam sterilizer

The request for this apparatus is deleted, for the same reason as mentioned above.

(21) Physiotherapy

(Conditions for Study)

The apparatuses requested from the Physiotherapy Department are easier to manage and maintain than those requested from other departments.

The old building is demolished, and the existing building is repartitioned by August 1997, for the purpose of securing, beside the Pharmacy Department, a space 1.5 times the present space for examination and treatment for outpatients and inpatients.

-[21-6] Bicycle exerciser

The request under this item number is deleted, because another request for bicycle exercisers is made under Item Number [21-4].

-[21-24] Electric traction

The request under this item number is deleted, because another request for an electric traction is made under Item Number [21-23].

-[21-32] Hand dynamometer

The request under this item number is deleted, because there is another request for a hand dynamometer under Item Number [21-26].

(22) Plastic & Reconstructive Surgery

(Conditions for Study)

The requested apparatuses are those which are used in the operating room and the outpatient division of the Plastic and Reconstructive Surgery Department. Appropriateness of the places for installing them has to be studied, and adjustment with other departments is necessary.

-[22-8] Operating binocular microscope

The request for this apparatus under this item number is deleted, and an operating binocular microscope will be provided for the Operating Room.

-[22-9] Operating table

The request for this apparatus under this item number is deleted, and four operating tables will be provided for the Operating Room.

-[22-10] Universal operating table

The request for this apparatus under this item number is deleted, and a universal operating table will be provided for the Operating Room.

(23) Radiology

(Conditions for Study)

The X-ray apparatuses of the Radiology Department are in very bad condition, and great impediments are consequently produced in everyday examination and treatment. In view of the fact that X-ray apparatuses are maintained in good condition in other hospitals in Paramaribo, which are similar in roles and conditions to Paramaribo Academic Hospital, there is no financial and technical problems in the operation of X-ray apparatuses, once they are introduced in the hospital. In the Radiology Department, two of five radiography apparatuses (Bucky) are operable, though with difficulty, the fluoroscopy apparatus is not operable because of total damage, the mammography apparatus is in normal operation, the tomography apparatus does not produce tomograms of good quality because of superannuation, and the angiography apparatus is not operable because of total damage.

-[23-3] X-ray planigraphic apparatus with X-ray generator

The request for this apparatus is deleted, because one is provided from the Netherlands.

-[23-4] X-ray TV system

The request for this apparatus is deleted, because there is no space for installing it.

-[23-5] C-arm X-ray TV system for surgical use

This apparatus should be provided in the Operating Room.

The request for it under this item number is deleted, because a request for one C-arm X-ray TV system is made for the Operating Room.

-[23-13] X-ray film illuminator

The request for this apparatus is rejected, because the existing X-ray film illuminators are working.

-[23-14] X-ray film processor

Although two X-ray film processors have been requested, a place has been prepared for installing only one. One

X-ray film processor will be therefore provided.

-[23-16] Darkroom lamp

Although two darkroom lamps have been requested, two are sufficient, in view of the number and space of darkrooms. Two darkroom lamps will be provided.

-[23-17] Dictaphone

The request for this apparatus is deleted, because it does not seem urgently necessary in the department.

-[23-18] X-ray tube & I.I. support

-[23-19] X-ray tube Ransing assembly

-[23-20] Bucky system X-ray collimator

These are classified as spare parts, which are not available in these days. The requests for them are therefore deleted.

-[23-22] Tilting wall Bucky stand

This is a device of a floating top Bucky table ([23- 21]), and provided as part of the table. The request for a tilting wall Bucky stand under this item number is therefore deleted.

-[23-24] Diagnostic X-ray TV system

The request for a diagnostic X-ray TV system is deleted, because there is no space for installing it.

-[23-25] - [23-28] Ultrasound transducers

The requests for ultrasound transducers are deleted, because they are spare parts for the existing apparatus.

-[23-29] Orthopantomographic X-ray unit

The request for this unit is deleted, because there is no space for installing it.

(24) Rehabilitation

(Conditions for Study)

There is a school for physically disabled children in the Rehabilitation Center, where usual school education and rehabilitation are provided. A study on the provision of apparatuses for this department has been made, in due consideration of these conditions.

-[24-3] 12 lead ECG

The request for this apparatus is deleted, because the existing X-ray film illuminators are operable, though they are old.

-[24-4] Ultrasound scanner

The request for this apparatus is rejected as unnecessary, because the hospital has no doctors in this department who have experienced the use of an ultrasound scanner.

-[24-7] Paraffin wax

The request for paraffin wax is deleted, because it is classified as an expendable medical article.

-[24-36] Forearm crutch adjustable

The request for this equipment is rejected, because there are a large number of adjustable forearm crutches in this department.

-[24-37] Four-caster walker

The request for this apparatus was deleted, for the same reason as mentioned above.

-[24-39] Audiometer for children

As this apparatus is necessary in speech training for children with speech impediments, one will be provided.

-[24-40] Audiometer for adults

One audiometer for adults will be provided, for the same reason as mentioned above.

-[24-41] Soundproof box

One soundproof box will be provided, as an apparatus related to the above-mentioned apparatuses.

-[24-42] Cassette tape recorder

One cassette tape recorder will be provided for the purpose of speech training.

(25) Surgery

(Conditions for Study)

The requested apparatuses are forceps for surgical operations. Assistance from the Netherlands has been taken into consideration.

-[25-1] Operation instrument set in metal case

The request for this set is deleted, because four sets are provided from the Netherlands.

(26) Urology

(Conditions for Study)

The requested apparatuses are those which are necessary in the outpatient division of the Urology Department.

-[26-17] Metal sheath with Luer-lock stopcock

The request for this apparatus is deleted, because an apparatus of a similar kind is requested under Item Number [26-14].

-[26-36] Catheter adapter

The request for this apparatus is deleted, because an apparatus of a similar kind is requested under Item Number [26-5].

(27) Ward

(Conditions for Study)

The requested apparatuses are basic ones necessary in nursing in the Ward.

-[27-5] Sphygmomanometer

The request for this apparatus for this department is rejected, because a request has been made for the Department of Internal Medicine.

-[27-22] Forearm crutches

The request for forearm crutches is rejected, because they are locally available and can be purchased at the hospital's own expense.

(28) Maintenance Department

(Conditions for Study)

The Maintenance Department is in charge of general maintenance and repairs on the apparatuses in the hospital.

Especially the Medical Electronics Division is supplied with repairing tools, with the assistance of a non-governmental organization in the Netherlands.

The request for the above-mentioned apparatuses is rejected in view of cost effectiveness, because these are not immediately necessary in maintenance after the project's completion.

(29) Nurse Training Center

(Conditions for Study)

The hospital has the Nurse Training Center in its premises, for the purpose of training students as nurses. Students receive training by using nursing dolls, nursing appliances, basic diagnostic apparatuses, audiovisual aids and other teaching materials. In the center, these items are insufficient for giving the students adequate training. The requested apparatuses are basic ones necessary for improving this situation and giving the students more substantial education.

-[29-1] Nursing Doll

-[29-2] Model of Female Pelvis with Fetus

-[29-3] Skelton

The request for above equipment is rejected, because those equipment are over rapping to the existing same type equipment.

-[29-8] Computer with Printer

The examination/treatment results are entered in patient's charts, while nurses record medications to

patients and classified totals of these medications. A computer with a printer is an apparatus necessary in conducting these jobs. A computer equipped with basic functions will be provided.

-[29-9] Television Set

-[29-10] Video Recorder

In nurse training, it is necessary to introduce nursing in advanced medical institutions both domestic and overseas. These requested apparatuses are necessary for videotaping nursing and scenes of medical examinations and treatment in these institutions for the purpose of showing videotapes to the students of the Nurse Training Center and thereby giving them detailed training regarding nurses' deeds required and how to take care of patients.

(30) Others

(Conditions for Study)

The requested apparatuses have been studied from the viewpoint of improving the functions of the hospital, with importance being laid on examination/treatment for patients.

-[30-1] Paging Communication System

How to establish close communication among medical workers should be further discussed within the hospital. The request for this apparatus is rejected, because the provision of the apparatus does not necessarily produce closer communication among them.

-[30-2] Wireless Communication System

Wireless communication system is rejected, because of its construction work.

-[30-3] Vehicles, one-patient ambulances

The requested vehicles shall be equipped with those medical apparatuses which are indispensable in an ambulance, such as an oxygen inhaler.

-[30-4] Vehicle, pick-up truck with 3-ton dump plate \

The request for this vehicle is rejected, because its use and cost effectiveness are not definite.

-[30-5] Vehicle, Garbage Disposal Truck

The request for this vehicle is rejected, because of low cost effectiveness and urgency. As an incinerator is provided, most of waste matter can be treated in it.

-[30-6] Electricity Generator <500 KVA>

The emergency power generator of the hospital supplies electricity to the operating rooms, the ICU, the Emergency Room, the emergency lifts and the emergency lights. The existing power generators were installed at the time of the establishment of the hospital, with respective capacities of 200 KVA and 266 KVA. As the existing power circuit is used also as an emergency circuit, the necessary capacity of the requested electricity generator is calculated on the basis of the apparatuses which need emergency power sources. As the existing apparatuses require a capacity of 466 KVA, the additional capacity is calculated, based on quantities consumed in the apparatuses to be provided under the Project and in the apparatuses to be provided from other donor nations. In the operating rooms, an increase of power consumption is 10 KVA for the anesthesia apparatus, the patient monitors and the pulse oximeters. In the ICU, where the number of beds is increased from five to nine, an increase of power consumption is 15 KVA for the central monitor, the bedside monitors and the infusion pumps. In the Emergency Room, an increase of power consumption is 10 KVA for the electroencephalographs, the suction pumps and the fetal monitors. It is expected that there is an increase of power consumption of 35 KVA in total. The planned electricity generator shall therefore

have a total capacity of 500 KVA. Two 250-KVA electricity generators will be provided, in view of space for installing them and from the viewpoint of easier maintenance.

-[30-7] Electricity Generators <300 KVA>

-[30-8] Electricity Generators <502 KVA>

Electricity generators requested under these item numbers are deleted, because they are not so urgently necessary.

-[30-9] Oxygen Plant

In the hospital, oxygen for medical use is supplied to

1. the Operating Room in the central building,
2. the ICU located in the second floor of the Ward,
3. the Emergency Room in the outpatient building and the Ophthalmology Ward, and
4. the rooms of the Pediatrics Ward

through independent manifolds. The oxygen supply system (which was replaced four years ago) for the Operating Room is now under operation, but the other three systems are not operable due to superannuation. In this manifold-type oxygen supply system, several cylinders are placed in one place and oxygen is sent through manifolds to places where oxygen is needed. Oxygen cylinders are procured and conveyed from a medical gas company in the city to the hospital, temporarily placed in the oxygen cylinder storehouse, and brought to each manifold to supply oxygen.

The requested oxygen plant produces oxygen in its oxygen generator and fills cylinders with oxygen thus produced. The cylinders filled with oxygen are conveyed to and connected with the manifolds, and oxygen is sent to the new ICU and Emergency Room where oxygen for medical use is needed.

• Oxygen Generator

The capacity of the oxygen generator is determined, based on the present consumption of oxygen. As the quantity of oxygen consumed now is equivalent to 150 oxygen cylinders per month, it is necessary to produce 35m³/day of oxygen. Though according to increase of patient member in the wards, demand of the oxygen gas also will increase approx. 7m³/day. In the Pediatric Ward, approx. 3m³ per 68 beds, including eight of the N.I.C.U. With all these being taken into consideration, the oxygen generator to be provided shall be capable of generating almost 50 m³/day of oxygen.

-[30-10] Environmentally Safe Incinerator

Waste from the hospital amounts to 1,170 bags/week for general waste and 318 bags/week for medical waste. If it is assumed that one bag weighs 3.8 kg on the average, the total amount of waste is 5,654 kg/week. Assuming that operating days of an incinerator is five days/week, with operating hours of it being six hours/day, an incinerator which is capable of incineration-disposal of 188 kg of waste in an hour is necessary. According to an incinerator manufacturer, capacity of an incinerator is calculated on the statistical basis of 2 kg/bed/day. Waste from the hospital, which has 391 beds, amounts to 5,474 kg in a week. An incinerator capable of burning 180 kg of waste to ashes in an hour is necessary for the incineration disposal of waste from the hospital, under the above-mentioned operating hours.

-[30-11] Copying Machine

Two copying machines will be provided for facilitating office work.

-[30-12] Personal Computer

Three personal computers will be provided: two for the Medical Registration and one for the Maintenance Department. The Medical Registration has to do so many jobs beyond the existing

computer's capacity of processing. Some jobs are left undone, as a result. Two personal computers will be provided, for the purpose of improving this situation by finishing all the required work. In the Maintenance Department, a warehouse is planned beside the department's facilities, for storing and managing spare parts. This plan is intended for establishing a maintenance system placing importance on the management of spare parts for the apparatuses to be provided under the Project, in an effort to strengthen the hospital's own maintenance and management system. The warehouse is completed in May 1997. One personal computer equipped with basic functions will be provided in this department.

-[30-13] Printer

Three printers will be provided for three personal computers to be provided under the above-mentioned item number.