


No. 4


STUDY REPORT  
ON  
THE PROJECT FOR DEVELOPMENT OF  
THE URBAN FIRE PREVENTION AND  
FIRE FIGHTING SYSTEM (PHASE II)  
IN  
THE REPUBLIC OF INDONESIA

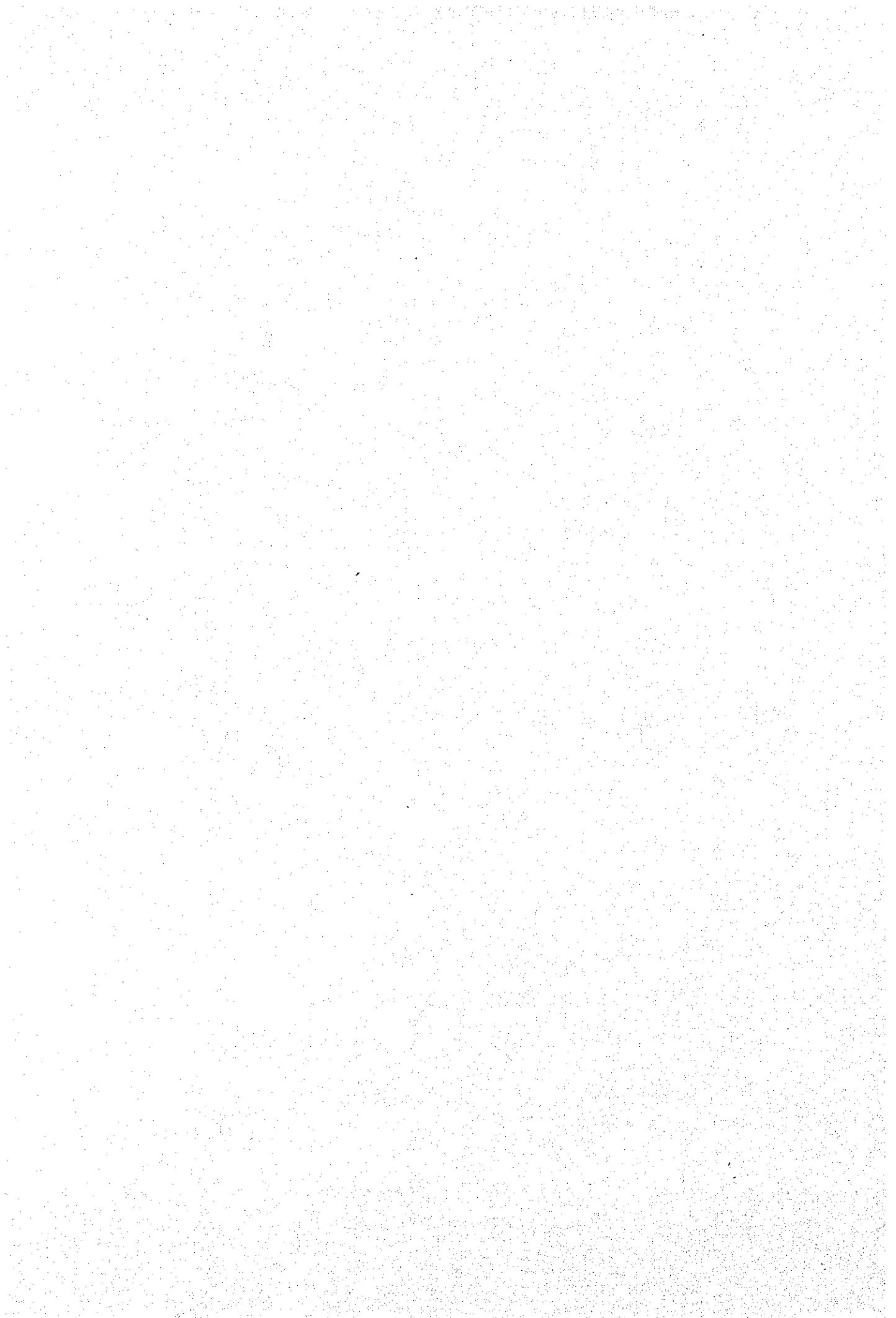
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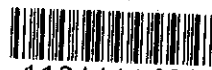
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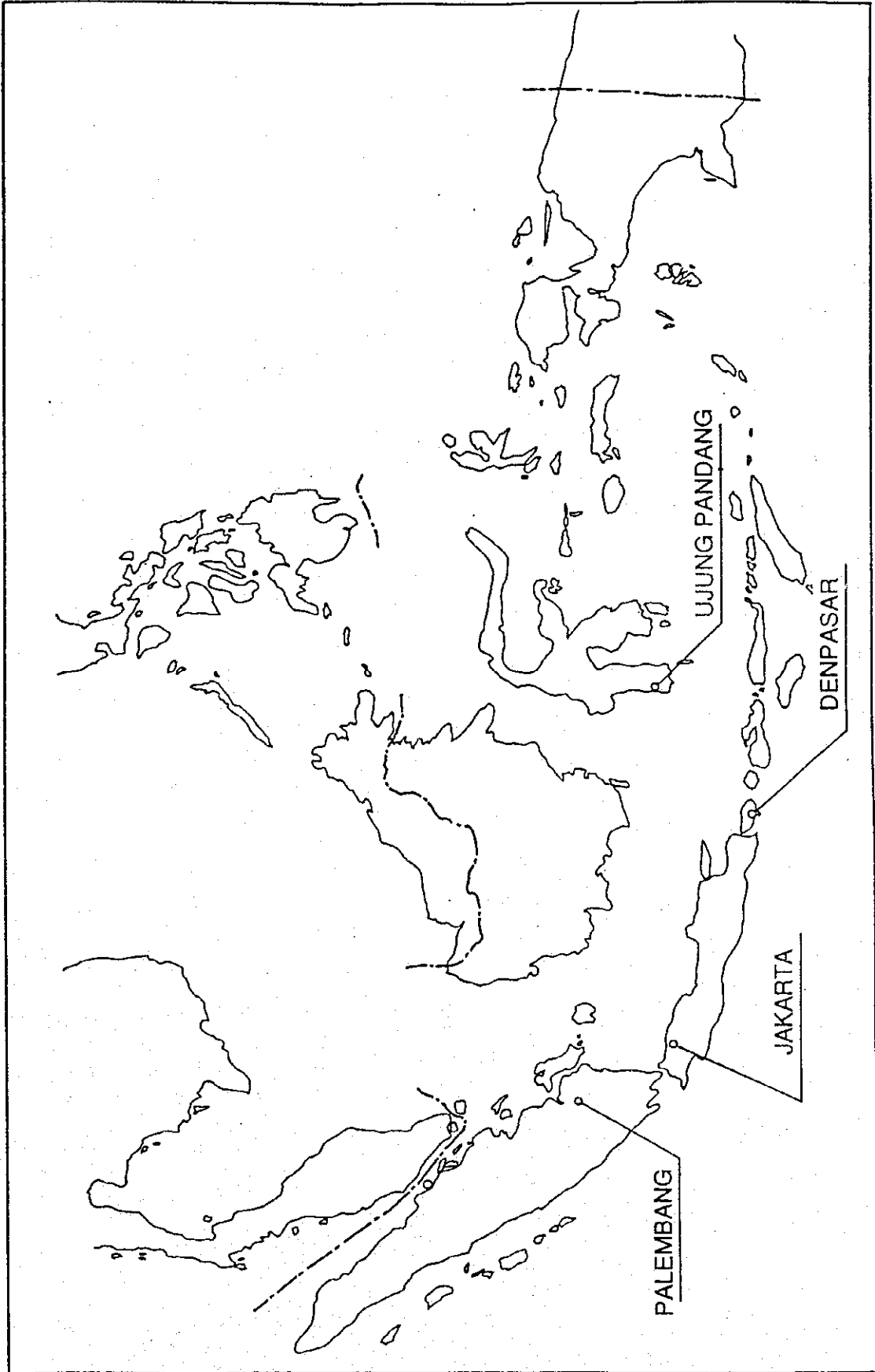
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THE PROJECT FOR DEVELOPMENT OF  
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FIRE FIGHTING SYSTEM(PHASE III)  
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## Chapter 1 Background of the Project

### 1. Background and Contents of the Request

#### ① Background of the Request

##### (1) Country and Natural Conditions

The Republic of Indonesia is situated between Long. 97° - 142° E. and Lat. 6° - 12° N. It is an island country composed of more than 13,500 islands and extends for 5,100 km west to east and 1,900 km north to south. The inhabited islands in the country number some 3,700 and among the major islands are Java, Sumatra, Kalimantan, West Irian, Bali and Timor etc.

The population of Indonesia in 1992 was 191.2 million, accounting for 57% of the combined total population of the six ASEAN countries. The national land area of Indonesia stands at 1,919,900 m<sup>2</sup> or five times the national land area of Japan. The spread of the population throughout the country is unbalanced with some 60% of the total living in the islands of Java and Madura. Most of the population is of Malay descent, however, there are many different races living together throughout the country.

Stretching from east to west across the country's thousands of islands is a volcanic belt, and indeed Indonesia is one the most prominent nations of volcanic activity in the world. Soil in Indonesia is generally speaking fertile in nature, however, because there are many mountainous and forest areas, only 11% of the national land area is actually arable.

As may be expected in a country that straddles the equator, the climate is tropical with high temperatures and humidity. The climate is moreover characterized by the monsoon and is therefore subject to great seasonal fluctuations.

##### (2) National Economy

The Republic of Indonesia does not only possess the largest population and national land area within the ASEAN region, it also boasted the largest GDP in the region with \$126.4 million in 1992. However, the level of economic development in Indonesia is

not as advanced as in the other ASEAN countries, and economic growth is also relatively low within this rapidly developing region. This, however, does not detract from the fact that the economic growth rate in Indonesia has been stable at around 7% in recent years.

Indonesia possesses abundant natural resources such as oil, nickel, tin, bauxite and natural gas etc. which it exports together with such agricultural products as raw gum, coffee and sugar etc. These stable exports, combined with the establishment of a rice self-supply system in 1984, has meant that the country's balance of trade has basically remained in the black. In recent years, the production capacity of industrial products has made rapid advances and non-petroleum and natural resource-based industrial products are becoming established as export industries. The advancement of road and bridge construction etc., combined with the spread and stabilization of the power supply, indicates the fact that the social infrastructure in Indonesia is gradually being developed. However, the country's rapid economic growth has caused various problems, such as the inequality of wealth distribution, the disparity of economic development between regions and the appearance of different classes within society, to become apparent.

The proper handling of these problems, which are the result of the country's infrastructural advancement and economic development, is the major issue facing the Government of Indonesia.

Since 1969, the Government of Indonesia has implemented consecutive national development plans, the result of which has been the steady development of the country's economy. The Fifth Five-year Development Plan (1989-1994) currently being implemented is the final phase of the First 25-year Long Term Plan, and the country can be said to be in the period of preparation for the next stage of development in which the objective is the achievement of economic independence.



### (3) Background of the Project

Through the implementation of the Fourth Five-year Plan (1984-1989) and the Fifth Five-year Plan (1989-1994), the Government of Indonesia has proceeded with the construction of an urban fire prevention and fire fighting system centered around local governments. However, in reality, the quantities of fire prevention facilities and fire fighting equipment in each of the cities are sparse and the system has been unable to match the rate of urban growth and development. The Government of Indonesia, keenly sensing the urgent need to develop the urban fire prevention and fire fighting system, thus requested the Government of Japan to provide grant aid in order to improve the fire prevention and fire fighting system in its cities. In response to this request, the Government of Japan instructed JICA to carry out the Project for Development of the Urban Fire Prevention and Fire Fighting System in Indonesia. Phase I and Phase II of the Project have so far been implemented with successful results.

The four cities targeted under the next phase of the Project are all core cities within their respective districts and the need for the procurement of fire fighting equipment in each is high. The populations in each of the cities are as indicated below.

<u>City</u>	<u>District</u>	<u>Population</u>
Denpasar	Bali I.	381,428
Palembang	Sumatra I.	1,287,000
Ujung Pandang	Sulawesi I.	1,164,000
Jakarta	Java I.	7,285,182

The Government of Indonesia has requested the Government of Japan to provide grant aid for the implementation of Phase III of the Project, in order to improve the fire fighting system in each of these cities.

### ② Contents of the Request

The following items of equipment have been requested.

<u>Requested Equipment</u>	<u>Quantity</u>
Turn-table ladder trucks (30 m)	2
Turn-table ladder truck (40 m)	1
Pumpers	6

## 2. Outline of the Sector

The economic development of Indonesia has seen the construction of high level buildings throughout its cities and the insufficiency of the current urban fire prevention and fire fighting system has been made apparent. A law enacted in 1987 put fire fighting activities and the development of fire prevention systems under the jurisdiction of local governments and made it their responsibility to construct such systems. However, due to the inability of the local governments to raise the necessary funds for the procurement of fire fighting equipment, the Government of Indonesia has fully subsidized the development of each city's fire prevention and fire fighting system. However, in reality, there exist great differences in the state of development of the system in each local government unit with some areas possessing organized fire brigades while others still rely on only one part of the Directorate of Regional Public Administration to conduct fire fighting activities.

In an attempt to overcome this problem, the Government of Indonesia compiled the Urban Fire Prevention and Fire Fighting Project and, on two occasions, requested the Government of Japan to provide grant aid for the implementation of the Project. The Government of Japan responded to the requests and as a result, Phase I and Phase II of the Project were implemented in 1987 and 1992 respectively. The implementation of the Project so far has proved to be effective in contributing to the strengthening of the fire prevention systems in each of the targeted cities.

The efforts made by the Government of Indonesia and the local governments, combined with the above mentioned overseas assistance, have led to the development of fire prevention systems

and the procurement of fire fighting facilities and equipment in the country's cities and districts. However, the rapidity with which modernization advances in Indonesia's cities has meant that additions to the fire fighting equipment in the major cities have been unable to keep pace with the growing need.

For example, the currently underway five-year project for the improvement of fire fighting capacity in Jakarta is a plan to add 200 fire fighting vehicles to the current fleet of 800 and to raise the number of fire fighting staff to 4,000, based upon the forecast that the population of the city will increase by 25% during implementation of the project. However, in reality, the rate of urbanization far exceeds the results of project implementation, as can be seen from the fact that although 5% of the city's roads undergo rehabilitation each year, the amount of vehicular traffic is increasing by an annual figure of 14%. Moreover, the development of fire fighting water supply facilities is hopelessly insufficient with there being only 350 fire hydrants throughout the whole city. It is therefore often the case that water from rivers and lakes, and even sea water in coastal districts, is being used for fire fighting purposes.

The number of fires occurring in Jakarta in recent years ranges from 650 to 930 and the annual costs of the fire damage vary between one billion yen and 2.8 billion yen.

Other cities in Indonesia face similar conditions and problems. The following table indicates the fire outbreak situation in recent years in each of the cities that have been targeted under Phase III of the Project.

City	Year 1990		1991		1992		1993	
	Outbreaks	Damage	Outbreaks	Damage	Outbreaks	Damage	Outbreaks	Damage
Denpasar	N.A.	N.A.	N.A.	N.A.	N.A.	N.A.	87	N.A.
Ujung Pandang	41	N.A.	50	N.A.	49	N.A.	66	N.A.
Palembang	26	N.A.	40	N.A.	30	N.A.	53	N.A.
Jakarta	739	10.69	931	18.35	654	13.67	789	28.21

Unit of damage: 100 million yen

## Chapter 2 Contents of the Project

### 1. Objectives of the Project

Phase III of the Project for Development of the Urban Fire Prevention and Fire Fighting System in Indonesia, which aims to strengthen the said system in Indonesia's rapidly urbanizing cities, intends to provide fire fighting equipment to the four targeted priority cities, which are core cities in their respective districts and high population concentration centers. The objectives of Project implementation are to ensure the safety of the lives and property of residents and tourists etc. and to promote the safe growth and development of industrial and commercial districts in each of the target cities.

### 2. Outline of the Project

#### ① Implementing Agencies and Operational Setup

The implementing and operating agencies for the Project are as follows.

Main supervisory agency: Ministry of Home Affairs

Operating agency: Directorate of Public Administration and  
Regional Autonomy

#### ② Maintenance Plan

The fire departments of each of the target cities shall have complete responsibility for the maintenance and control of the equipment to be provided under the Project. Each of the fire departments possesses its own maintenance section and workshop and performs daily inspections and repairs of equipment. Furthermore, the Ministry of Home Affairs and the Directorate of Public Administration and Regional Autonomy shall assume the responsibility for providing the necessary budget for the maintenance and operation of the equipment to be provided.

### 3. Design Concept

#### ① Examination of Basic Conditions

The equipment to be provided under the Project shall be installed at the main fire stations of the fire departments in each of the four targeted cities (Denpasaro, Palembang, Ujung Pandang and Jakarta). Each fire department shall possess a fire fighting vehicle and equipment maintenance section and the engineers and maintenance staff shall carry out daily inspections and repairs in order to ensure that the equipment is continually in optimum condition and ready for use at any time.

The method of operation of the fire fighting vehicles to be provided is basically the same regardless of year and model, and it is thought that there should not be any problems regarding the use of the vehicles providing that ample explanations are given at the time of delivery. Moreover, the engineers in each of the fire departments possess ample technical knowledge and experience regarding fire fighting vehicle maintenance and it is expected that they are capable of carrying out effective maintenance and control of the vehicles.

② Examination of Each Item of Equipment

\* Two Turn-table Ladder Trucks (30 m)

It is planned to provide one turn-table ladder truck each to the cities of Palembang and Ujung Pandang. Such trucks are the easiest to handle and have the widest range of potential uses and they are considered appropriate for use in the above mentioned two cities, where, although urbanization is advancing, there are hardly any high level buildings.

Only two companies in Japan are producing these trucks, however, both have had experience of delivering equipment to Indonesia.

\* One Turn-Table Ladder Truck (40 m)

Equipment, which can be used in fighting fires in high level buildings, was requested for provision to Jakarta, where many high level buildings have been constructed, and a 40 m turn-table ladder truck was thought to be appropriate in consideration of safety and ease of use.

Only two companies in Japan are producing these trucks, however, both have had experience of delivering equipment to Indonesia.

\* Six Pumpers (4,500 L)

It is planned to provide two pumpers each to the cities of Denpasar, Ujung Pandang and Palembang. Each of these cities possess poor fire fighting facilities and, in particular, have hardly any fire hydrants. It is considered that the provision of pumpers, which play an important role in initial fire fighting, will prove beneficial to fire fighting activities in each of these cities.

There are a number of companies in Japan which make pumpers, however, only two were able to match the requested estimate. Both of these companies have had experience in delivering equipment to Indonesia.

4. Equipment Specifications

(1) 30 m Turn-table Pumping Trucks(2)

- \* Vehicle: 200 PS diesel engine, six operators,  
16-ton total weight
- \* Ladder: Height reach Min. 30 m, 4-stage, with turn-table,  
allowable load at tip Min. 250 kg, fitted with safety  
devices and also possessing attached basket and lifter
- \* Pump: Discharge capacity: Atmospheric pressure Min. 2,850 L/min  
(8.5 kg/cm<sup>2</sup>)  
High pressure Min. 200 L/min  
(40.0 kg/cm<sup>2</sup>)
- \* Attachments: On-board fire fighting tools and standard tools

(2) 40 m Turn-table Pumping Truck (1)

- \* Vehicle: 275 PS diesel engine, six operators,  
21-ton total weight
- \* Ladder: Height reach Min. 40 m, 5-stage, with turn-table,  
allowable load at tip Min. 250 kg, fitted with safety  
devices and also possessing attached basket and lifter

- \* Pump: Discharge capacity: Atmospheric pressure Min. 2,850 L/min  
(8.5 kg/cm<sup>2</sup>)  
High pressure Min. 200 L/min  
(40.0 kg/cm<sup>2</sup>)
- \* Attachments: On-board fire fighting tools and standard tools

(3) Pumpers (3)

- \* Vehicle: 160 PS diesel engine, six operators,  
12-ton total vehicle weight
- \* Pump: Discharge capacity: Atmospheric pressure Min. 2,850 L/min  
(8.5 kg/cm<sup>2</sup>)  
High pressure Min. 200 L/min  
(40.0 kg/cm<sup>2</sup>)
- \* Tank: Water tank with capacity of around 4,500 L
- \* Attachments: Water feed and discharge hose,  
on-board fire fighting tools and standard tools

## Chapter 3 Project Evaluation and Recommendations

### 1. Project Effects

Following the implementation of Phase I and Phase II of the Project for Development of the Urban Fire Prevention and Fire Fighting System in Indonesia, this phase (Phase III) of the Project aims to provide fire fighting equipment (turn-table ladder trucks and pumpers) to four cities, which are high priority in terms of the need for a fire prevention system. These cities need to have continuously well maintained fire fighting equipment that is suited to the local conditions, in order to maintain and improve the respective fire prevention systems. These four cities are in particular need of modern fire fighting equipment due to the construction of high level buildings, increases in the working population and the numbers of tourists etc. and a worsening of traffic conditions etc., following each city's rapid urbanization. The direct effect of the equipment provision will be the secured safety of the lives and property of the citizens living in each of the cities. Moreover, by providing the kind of modern equipment that is necessary for the development of a fire prevention system on a national scale, it can be expected that Project implementation will contribute to an improvement of the fire prevention system, a strengthening of fire fighting tactics and a raising in the technical level of fire fighters within the country.

### 2. Recommendation

The Republic of Indonesia is a large country possessing a population of around 190 million, and the urban population is rapidly increasing due to the trend of urbanization that has been taking place in recent years. The development of an urban fire prevention and fire fighting system to cope with the increasing urbanization is thus a major issue facing the country, and it can be said that the fire prevention organization in Indonesia is currently in the expansion stage. Although fire prevention systems



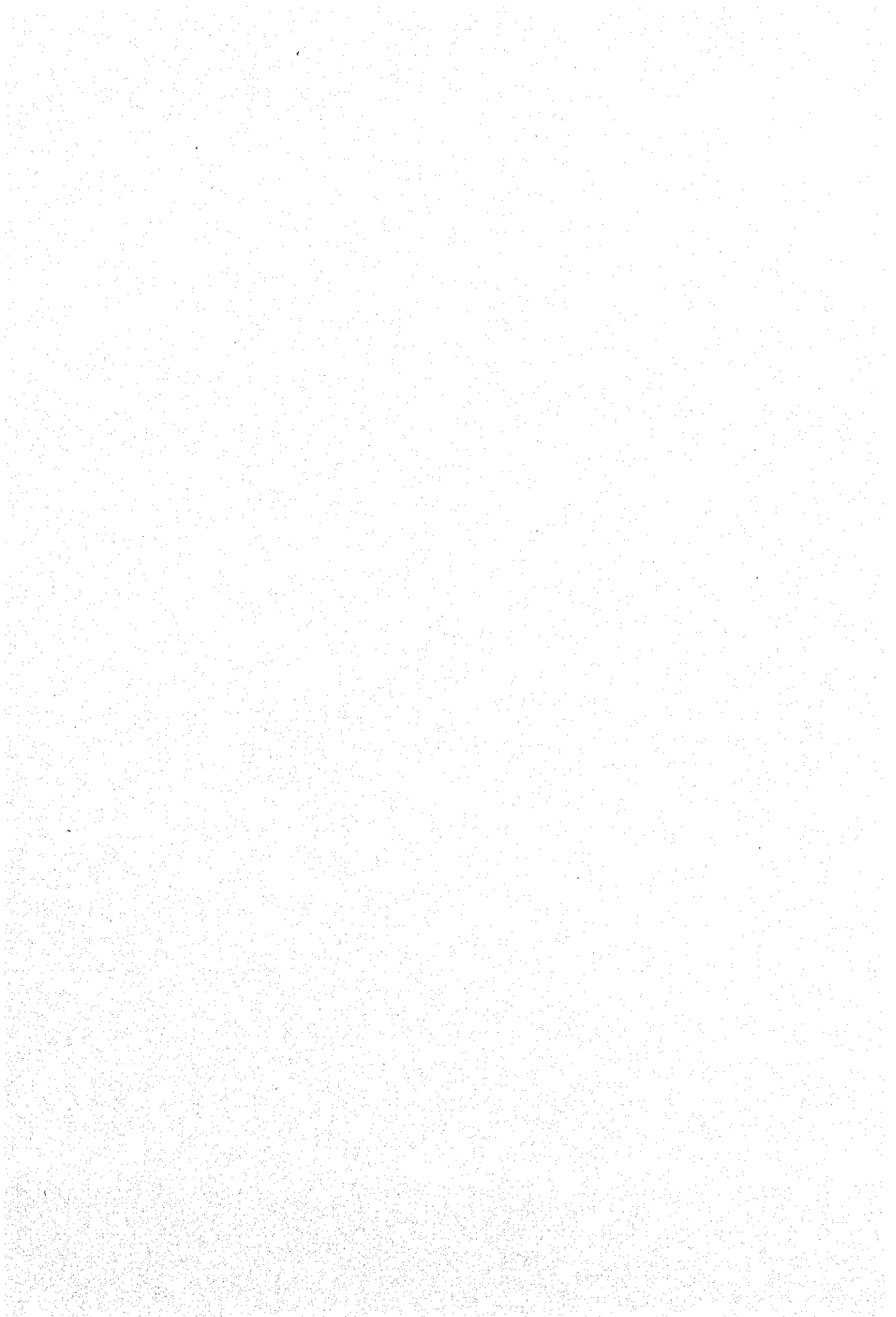
are in place on the national and the local government levels, the current issue is the addition of modern fire fighting equipment and the acquisition of fire fighting tactics and techniques which are appropriate for urban centers.

It is important that the Project is implemented upon fully understanding these current conditions and selecting the items of equipment and specifications that are required most by the Indonesian side. Moreover, it is felt that ample technical training in the handling, inspection, repair and maintenance of the provided equipment, combined with the most effective usage of the equipment by the Indonesian side, will help make the effects of Project implementation even more worthwhile.









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