(11) To procure and to install the equipment and materials for low voltage distribution lines including household panels, watt-hour meters, street lighting and their grounding system in accordance with proper implementation schedule to meet the requirements of Japan's Grant Aid.

(12) To take necessary measure for the prevention of environmental pollution such as disposal of oil sludge, etc.

(13) To take necessary measures for improvement of the tariff system in order to maintain the sustainable operation of the public power supply system.

(14) To provide proper disposal places of excavated soil, waste water and oil discharged during the implementation period.

3-2 Operation and Maintenance Plan

(1) Basic Principles

The most important facilities to be provided under the Project from the maintenance point of view are the generating units. The proper maintenance of these units and their operating environment is, therefore, essential to ensure a stable power supply in response to the daily demand fluctuations. In order to maintain the proper performance and functions of the planned generating units to ensure a stable power supply, the implementation of preventive maintenance is desirable to ensure the improved reliability, safety and efficiency of the generating units. Fig. 3-2-1 shows the basic concept of such maintenance.

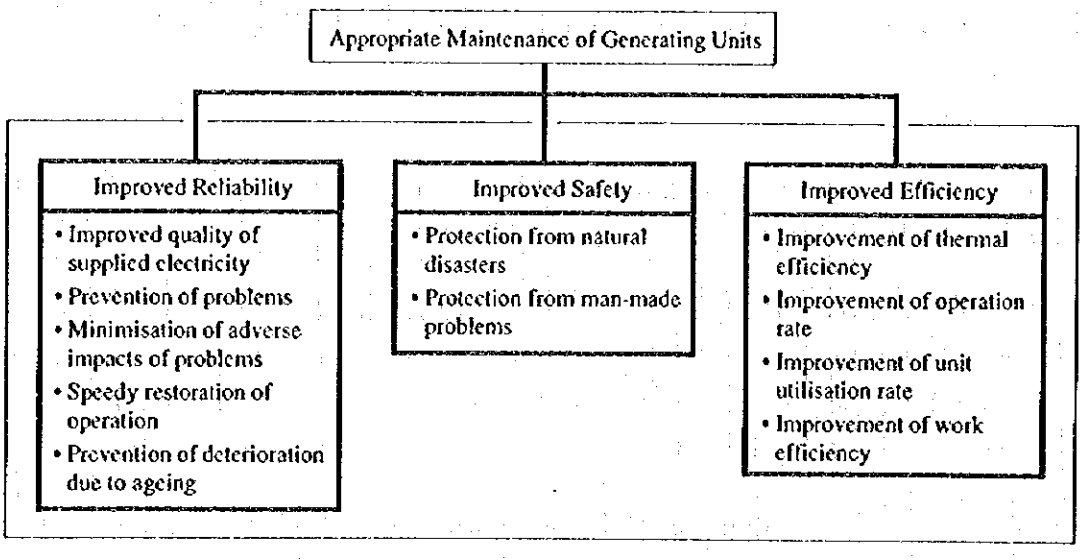


Fig. 3-2-1 Basic Concept of Generating Unit Maintenance

The Palauan side will keep the basic maintenance principles in mind and will use the O & M technologies/skills transferred through the OJT by the Japanese Contractor during the construction period and O & M manuals to conduct the operation and maintenance of the generating units following completion of the Project.

(2) Operation Plan for New Generating Units

The planned new generating units will provide the base load for the centres of economic activities in Palau as described in 2-3-2 and the following operation conditions are deemed appropriate.

Annual operation rate : approximately 90%
Annual operating hours : approximately 7,800 hours

Table 3-2-1 shows the regular inspection items required for the proper operation of the new generating units. Fig. 3-2-2 shows the annual operation programme for the new generating units for the first year based on the operating conditions mentioned above, taking the regular inspection items into consideration.

During the maintenance period for the new generator which will take 34 days/year as shown in Fig. 3-2-2 the following generating facilities shall be utilized as a supplemental power supply unit.

- The existing generators at Malakal power station which will be able to stop their operation when new generators start to operate
- Aimeliik power station

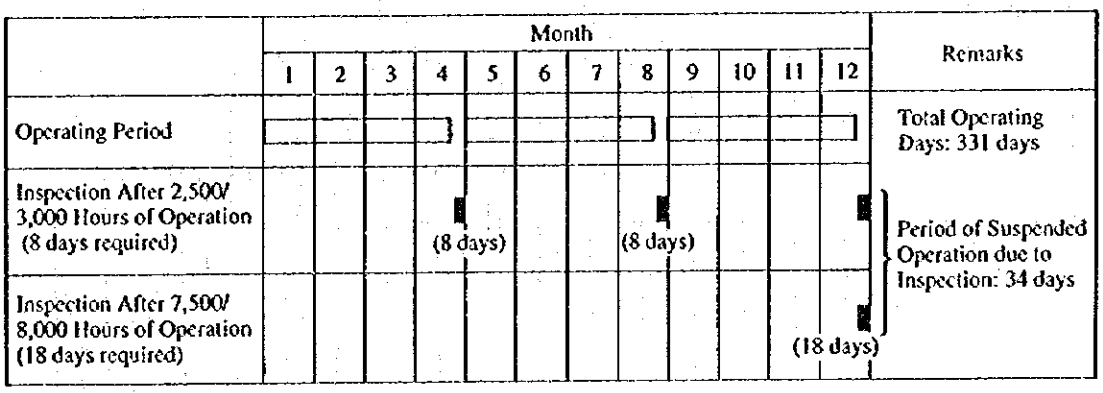


Fig. 3-2-2 Annual Operation Programme for New Generating Units

Table 3-2-1 Standard Regular Inspection Items

Item	Type of Inspection	Main Inspection Items/Work
Diesel Engine	Daily Inspection	• Checking of fuel tanks level, lubricating oil level of sump tank • Checking of jacket cooling water tank level • Checking of starting-up air receiver pressure
	Inspection After Every 1,000 Hours	• Checking of proper tightening of nuts and bolts • Cleaning of fuel and lubricating oil filters
	Inspection After 2,500/3,000 Hours	• Checking of proper working and oil leakage for intake and exhaust valves, starting valve, fuel valve, fuel pump, piston and liner, etc. • Analysis of lubricating oil quality of sump tank
	Inspection After 7,500/8,000 Hours	• Checking of proper working of and oil leakage from piston and cylinder liner and replacement of gasket • Replacement of piston ring, oil-scraping ring and O-ring • Overhaul of cylinder head and replacement of gasket and O-ring • Inspection of suction and exhaust valves and replacement of exhaust valve O-ring • Inspection of fuel injection valve and replacement of nozzle • Inspection of crank pin bearing and necessary replacement • Overhaul and inspection of turbo charger and replacement of bearings, etc. • Analysis and replacement, if necessary, of lubricating oil in sump tank
	Inspection After 16,000 Hours	• All items under "Inspection After 7,500/8,000 Hours" • Inspection and replacement, if necessary, of main bearings • Inspection and replacement, if necessary, of exhaust valve rotor • Overhaul, inspection and replacement, if necessary, of lubricating oil pump attached to engine
Generator	Daily Inspection (when in operation)	• Visual inspection of all sections and checking of abnormal sound and temperature
	Monthly Inspection	• Checking of abnormal vibration • Checking of lubricating oil flow and oil leakage from bearings • Necessary cleaning of components
	Annual Inspection	• Measurement of insulation resistance and inspection of lead wires and terminals • Visual inspection of accessories, including space heater • Visual inspection of bearings and cleaning, if necessary

Note: The following days are required to complete the standard inspections listed in the table.
- 2,500/3,000 hours inspection : 7 - 8 days/time
- 7,500/8,000 hours inspection : 15 - 18 days/time
- 16,000 hours inspection : 20 - 25 days/time

(3) Fuel Procurement Plan

The estimated annual fuel (diesel oil) consumption volume to run the generating units to be procured and installed under the Project is approximately 12,930 kilolitres for the 2 units based on an assumed operation rate of 90%. The PUC will be required to prepare and implement a practical fuel procurement plan to ensure the steady operation of the said generating units.

(4) Spare Parts Procurement Plan

The spare parts for the generating units are classified as standard spare parts which require replacement after a certain length of operation and spare parts reserved for emergency replacement at the time of an accident, etc. The Government of Palau is required to procure an appropriate quantity of spare parts for the periodical inspection cycle shown in Table 3-2-2.

The procurement of spare parts required for two (2) years operation is planned under the Project and the main items determined from the periodical inspection schedule are listed in Table 3-2-2. Accordingly, the Government of Palau is required to set aside the necessary funds to procure the standard spare parts (approximately 3% of the generating unit cost) and emergency spare parts by the end of the second year of the commissioning of the new generating units.

Table 3-2-2 Spare Parts and Maintenance Tools to be Procured Under the Project

I. Spare Parts

No.	Item	Quantity	Remarks
1	Cylinder Cover		
	1) Packing, O-Ring, etc.	6 sets/cylinder × 2 units	
	2) Gasket Packing	"	
	3) Packing (Air Feed Pipe)	"	
	4) Cylinder Cover Complete	one set	ESP *
2	Intake Valve		
	1) Funnel Cap	one set/cylinder × 2 units	
	2) Valve Spindle	"	
	3) O-Ring	6 sets/cylinder × 2 units	
	4) Intake Valve Complete	1/3 set/cylinder	ESP
3	Exhaust Valve		
	1) Valve Spindle	1.5 sets/cylinder × 2 units	
	2) Sleeve	"	
	3) Valve Seat	"	
	4) O-Ring	6 sets/cylinder × 2 units	
	5) Funnel Cap	one set/cylinder × 2 units	
	6) Exhaust Valve Complete	1/2 set/cylinder	ESP
4	Fuel Injection Valve		
	1) Nozzle Chip	6 sets/cylinder × 2 units	
	2) O-Ring	"	
	3) Fuel Injection Valve Complete	one set/cylinder	ESP
5	Piston		
	1) Piston Ring	2 sets/cylinder × 2 units	
	2) Oil Ring	"	
	3) Piston Pin Bearing	one set/cylinder × 2 units	
	4) Piston Head Tightening Bolt	"	
	5) O-Ring	2 sets/cylinder × 2 units	
	6) Piston Complete	one set	ESP
6	Connecting Rod		
	1) Crank Pin Bearing	2 sets/cylinder × 2 units	
	2) Fastening Bolt	one set/cylinder × 2 units	
	3) Connecting Rod Complete	one set	ESP
7	Main Bearing		
	1) Main Bearing	2 sets/cylinder × 2 units	
	2) Thrust Bearing	2 sets × 2 units	
8	Cylinder Liner	1/4 set/cylinder	ESP
9	Fuel Injection Pump		
	1) Plunger Sleeve	2 sets/cylinder × 2 units	
	2) Delivery Valve Complete	one set cylinder	ESP
	3) Deflector	2 sets/cylinder × 2 units	
	4) O-Ring	6 sets/cylinder × 2 units	
	5) Fuel Injection Pump Complete	1/4 set/cylinder	ESP

No.	Item	Quantity	Remarks
10	Turbo Charger		
	1) Bearing	2 sets × 2 units	
	2) Thrust Bearing	2 sets × 2 units	
	3) Gas Outlet Guide Pipe	one set	ESP
11	Air Cooler		
	1) Packing	2 sets × 2 units	
12	Starting Valve		
	1) Packing	6 sets/cylinder × 2 units	
	2) Starting Valve Complete	1/4 set/cylinder	ESP
13	Cylinder Safety Valve		
	1) Packing	2 sets/cylinder × 2 units	
	2) Cylinder Safety Valve Complete	1/3 set/cylinder	ESP
14	Indicator Valve Complete	one set/cylinder × 2 units	
15	Exhaust Expansion Pipe	one set/cylinder × 2 units	
16	Fuel Injection Pipe	1/2 set/cylinder × 2 units	
17	Instrumentation Parks		
	1) Pressure Switch	one of each kind	ESP
	2) Temperature Switch	"	ESP
	3) Pressure Gauge	"	ESP
	4) Temperature Gauge	"	ESP
18	Auxiliary Equipment Pumps		
	1) Fuel Oil Circulating Pump	one set	ESP
	2) Lubricating Oil Priming Pump	"	ESP
	3) Lubricating Oil Transfer Pump	"	ESP
	4) Jacket Cooling Water Pump	"	ESP
	5) Fuel Oil Drain Discharge Pump	"	ESP
	6) Oily Water Transfer Pump	"	ESP
	7) Waste Oil Discharge Pump	"	ESP
	8) Municipal Water Supply Pump	"	ESP
	9) Spare Parts (Packing Rings) for Auxiliary Pumps	200% × 2 units	
	10) Oily Water Separator Parts	one set × 1 unit	
	11) Packing for Cooler	200% × 2 units	
19	Electrical Spare Parts		
	1) Bearing	one set × 2 units	
	2) Silicon Rectifier	one set × 2 units	
	3) AVR	one set × 2 units	
	4) Auxiliary Relays	one of each kind	ESP
	5) Timers	"	ESP
	6) Indicating Lamp	100% × 2 units	
	7) Fuse	100% × 2 units	
	8) Vacuum Bulb	3	ESP
	9) Selector Switch	2 × 2 units	
	10) Control Relay Unit for CB	2	ESP
	11) CB Closing Coil	2	ESP
	12) CB Trip Coil	2	ESP
	13) Relay Glass Cover	1	ESP

Remarks 1) ESP: Emergency Spare Part

2) As to the Emergency Spare Parts, only 1 unit shall be supplied.

II. Maintenance Tools

No.	Item	Quantity	Remarks
1	Maintenance Tool Set	one set	
2	Suction and Exhaust Valve Grinding Machine	1	
3	Suction and Exhaust Valve Seat Grinding Machine	1	
4	Oil Control Instruments	one set	
5	Water Control Instruments	one set	
6	Tool Box (Steel)	one set	
7	Suction and Exhaust Valve Seat Welding Machine (AC210V, 250A)	1	
8	Electric Grinder (AC100V, 100 mm)	1	
9	Electric Drill (AC100V, 1 kVA)	1	
10	Step-Down Transformer (AC210V/100V, 1 kVA)	2	
11	Measuring Instruments (Caliper and Micrometer)	one set	
12	Fixed Type Vice Work Table	1	
13	Vice (155 mm)	1	
14	Medium Size Tool Cabinet (2 Compartments and 6 Shelves)	1	
15	Hand Truck (500 kg with Stopper)	1	
16	Surface Plate (750 × 750 × 120 mm, Class B)	1	
	Ladder (Aluminium, 2 Sections)		
17	Chain Blocks (one ton × 2.5 m, 2.5 tons × 3 m)	1	
18	Wire Ropes (6 mm, 8 mm, 10 mm, 14 mm)	one set	
19	Testing and Maintenance Equipment	one set	
20	1) AC Ammeter (2 - 20A)	1	
	2) AC Ammeter (10 - 100A)	1	
	3) AC Voltmeter (75 - 150V)	1	
	4) AC Voltmeter (300 - 750V)	1	
	5) DC Ammeter (1 - 30A)	1	
	6) DC Ammeter (30 - 1,000A)	1	
	7) AC Voltammeter (13 Ranges)	1	
	8) DC Voltammeter (17 Ranges)	1	
	9) Insulation Resistance Tester (500V/1,000M ohm)	1	
		1	
	10) Insulation Resistance Tester (1000V/2000M ohm)	1	
		1	
	11) Circuit Meter	1	
	12) Cycle Counter	1	
	13) Millisecond Counter	1	
	14) Phase Meter (0 - 360°)	1	
	15) Water Rheostat (250V, 50A)		

No.	Item	Quantity	Remarks
	16) Single Phase Voltage Regulator	1	
	(0 - 250V, 0 - 360°)	1	
	17) 3 Phase Voltage Regulator (0 - 260°V, 0 - 360°)	1	
	18) Slide Rheostat (170 ohm/1A)	1	
	19) Slide Rheostat (39 ohm/2A)	1	
	20) Slide Rheostat (10 ohm/4A)	1	
	21) Phase Tester (50 - 450V, 40 - 65 Hz)	1	
	22) Insulating Transformer (5 kVA)	1	
	23) Protective Relay Tester (0 - 50V, 0 - 300A)	1	
	24) Protective Relay Tester (0 - 360°, 0 - 240V)	1	
	25) Earth Resistance Meter	one set	
	26) Portable Radio Transmitter	one set	
	27) Test Plug for Relay	one set	
	28) Test Plug for Relay Terminals	1	
	29) Battery Accessories	one set	
	30) Watthour Meter		
	31) Oscilloscope		

III. OJT Equipment, etc.

No.	Item	Quantity	Remarks
1	Television (20" Colour)	1	
2	Video Cassette Player	1	
3	Video Tapes	1	
4	Textbooks (for 10 Trainees)	one set	

(5) Electricity Tariff Plan

The PUC currently charges 9 cents/kWh for its public electricity supply service and Table 3-2-3 shows the estimated operation income and expenditure of the new generating units based on this charge level. As the table shows, an annual operation rate of 90% (7,884 hours/year/unit) results in a very favourable balance, making the generating units self-financing, while the balance goes into the red with an operating rate of below 70%. In view of this prospect, the Government of Palau should conduct proper maintenance to maintain the new generating units at an operating level which produces a favourable financial return.

Table 3-2-3 Estimated Income and Expenditure for Planned Generating Units

Item	Unit	Annual Operating Rate				
		50%	60%	70%	80%	90%
I. Income						
1. Generating Capacity (3,400 kW × 2)	kW	6,800	6,800	6,800	6,800	6,800
2. Annual Operating Hours	hr	4,380	5,256	6,132	7,008	7,884
3. Electric Energy Generated (1 × 2)	kWh	29,784,000	35,740,800	41,697,600	47,654,400	53,611,200
4. Station Loss	%	2	2	2	2	2
5. Transmission Loss	%	5	5	5	5	5
6. Electric Energy Sold	kWh	27,699,120	33,238,944	38,778,768	44,318,592	49,858,416
7. Average Unit Sales Price	US$/kWh	0.09	0.09	0.09	0.09	0.09
8. Total Income	US$	2,492,921	2,991,505	3,490,089	3,988,673	4,487,257
II. Expenditure						
1. Fuel (3 × (6) × (3))	US$	1,843,034	2,211,641	2,580,247	2,948,854	3,317,461
2. Lubricating Oil (3 × (6) × (4))	US$	56,232	67,479	78,725	89,972	101,218
3. Cooling Water	US$	0	0	0	0	0
4. Personnel (US$8,000/person × 25 persons)	US$	200,000	200,000	200,000	200,000	200,000
5. Maintenance	US$	159,563	159,563	159,563	159,563	159,563
6. Head Office Management	US$	49,858	59,830	69,802	79,773	89,745
7. Depreciation	US$	397,553	397,553	397,553	397,553	397,553
8. Total Expenditure	US$	2,706,241	3,096,065	3,485,890	3,875,715	4,265,540
III. Operation Balance	US$	− 213,320	− 104,560	4,199	112,958	221,717

Preconditions
(1) The unit sales price is set at 9 cents/kWh which is currently charged by the PUC.
(2) The house loss and transmission loss are assumed.
(3) The fuel cost is estimated to be US$0.26/litre.
(4) The lubricating oil cost is estimated to be $1.18/litre.
(5) The cooling water cost is estimated to be free.
(6) The consumption volumes of fuel and lubricating oil are estimated as follows:
Fuel : 0.238 litres/kWh
Lubricating Oil : 0.0016 litre/kWh
(7) The personnel cost is calculated based on US$8,000/year for a manpower strength of 25 employees, including 4 power transmission and distribution network maintenance workers.
(8) The maintenance cost covers the cost of regularly changed spare parts, etc. and is estimated at 3% of the original equipment cost.
(9) The management cost (head office cost) is estimated at 2% of the power sales income.
(10) The depreciation cost is calculated based on the straight line method using the main unit cost of the generating facility in question with an expected life of 15 years and the residual value after 15 years of 0%.
(11) The foreign exchange rate used is US$1 = ¥109.

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

CHAPTER 4 PROJECT EVALUATION AND RECOMMENDATION

4-1 Project Effect

The Project includes the construction of new generating units (3.4 MW × 2) at the Malakal Power Station to replace the noticeably deteriorated existing generating units. The successful completion of the Project in the planned year of 1997/98 will greatly improve the present insufficient power supply situation in Koror, the capital, and entire Babeldaob Island where some 70% of Palau's total population lives. The establishment of a reliable base load power supply, which is one of the main targets for the power sector under the NMDP, will ensure the preservation of the capital's functions and the stabilisation of public lives. In addition, the Malakal Power Station at which the new generating units will be installed under the Project will be coordinated with the Aimelik Power Station to act as base load stations for a unitary power supply system to Koror State and Babeldoab Island, the key areas of Palau's economy. As a result of such coordination, the power generation and supply system will become more rational and efficient than was previously the case.

Moreover, another component of the Project, i.e. extension of the power line to the 4 northern states of Babeldoab Island (Ngerchelong, Ngeraard, Ngerdmau and Ngiwal), will replace the present limited power supply of several hours a day by small emergency diesel generators with 24 hour supply through the national power supply network. Furthermore, the current voltage drop of more than 25% will be improved to less than 10%, ensuring a higher standard of living and the stable operation of such public facilities as schools and dispensaries, etc. Extension of the power lines under the Project will, therefore, contribute to rectifying the social and economic gaps between the northern states of Babeldoab Island and other states, achieving an equitable share of the benefits through the development of the public power service as called for by the NMDP.

The operation and maintenance of the new facilities following the completion of the Project will be conducted by the PUC under the supervision of the Ministry of Resources and Development, the implementation body of the Project on the Palau side. As the PUC is a relatively new organization established in February, 1994, it still requires the financial assistance of the central government for its operation. However, there are many signs of attempts by the PUC to improve both its operational and financial strength by means of systematically recruiting new staff, enforcing the meter rate system and revising the tariff. No special problems casting doubt on the implementation of the Project are foreseen if the operation and maintenance of the new facilities is conducted by the PUC under the supervision of the Ministry of Resources and Development.

The revenue and expenditure balance in connection with the operation of the new generating units and power network facilities constructed or installed under the Project is expected to produce a surplus if the annual operating rate of the generating units reaches 70% or higher based on the current PUC tariff of 9 cents/kWh. In this case, the future cost of maintenance and replacing the facilities (depreciation cost) can be met internally, promising self-reliant operation of the power supply system.

Among the equipment to be procured under the Project, the generating units are expected to most affect the environment. However, their possible adverse impacts on people living near the Malakal Power Station in terms of oil contamination in discharge water, sound noise level, NOx and SOx level, etc., will be minimised by a series of countermeasures to be introduced in the Project.

The implementation of the Project will consolidate an important component of the social infrastructure in Koror State and Babeldaob Island (total population benefiting from the Project: 17,834, estimate for 1998), both of which form the key economic region in Palau. The resulting inducement and encouragement of development plans should lead to the vitalisation and stable management of industrial activities, general improvement of the local standard of living and rectification of the regional gap. It can be said that the new facilities will form a part of the foundations to support Palau's economic independence.

The above assessment of the Project suggests that the Project will be implemented without any difficulties and that the Project is highly suitable for Japan's grant aid system in view of the wide ranging benefits it will achieve in Palau.

Current Situation and Problems	Improvement Measures Under the Project	Project Effects and Degree of Improvement
I. Malakal Power Station Improvement Plan		
1. It is expected that the shortage of the base load supply capacity, which is essential for stable power supply, will increase to some 6.3 - 8.8 MW in 1997/98. This shortage has already resulted in unstable power supply, causing such social problems as unsteady daily life and inconsistent economic activities.	Construction of 2 generating units (3.4 MW each) at the Malakal Power Station to provide the base load for the target year 1997/98.	Establishment of a stable base load generation capacity and a reliable power supply system will establish the stable, 24 hour/day power supply system to Koror, the Capital of Palau, and the entire Babeldaob Island.
2. Most of the existing generating units of the Malakal Power Station were manufactured some 20 years ago and no longer manufacturers exist. They suffer from frequent breakdowns due to ageing and the shortage of spare parts. The current output is some 50-80% level of the rated output and fuel consumption efficiency is poor (0.327ℓ/kWh).	As above	Introducing of new generator units will improve the fuel efficiency (some 0.24ℓ/kWh) which is 37% improving comparing with the existing unit. Therefore, the economical operation with high efficiency will be made.
II. Transmission and Distribution Network Extension Plan for 4 Northern States of Babeldoab Island		
1. At present, there is no national power network in these states. Power is locally supplied by emergency generating units and the supply is unstable as it is limited to only 5 - 6 hours/day.	Extension of the power transmission and distribution network to these states from the existing lines in the southern part of Babeldaob Island which was constructed under previous projects.	The provision of a stable 24 hour/day power supply will stabilise local life and the operation of public facilities.
2. The unstable power supply hinders the proper operation of such public facilities as dispensaries and schools.	As above	The availability of 24 hour/day power supply and the improvement of voltage drop to less than 10% will enable the stable operation of public facilities.
3. There is a growing gap between the electrified southern states and the non-electrified northern states in terms of the standard of living.	As above	The gap will be narrowed by improvement of the standard of living in the north and dispersion of the population to local areas will be accelerated.
4. The unstable power supply fails to vitalise fishing ports which support local life in the north.	As above	The reliable and efficient operation of refrigerator and ice-making facilities, etc., will vitalise and modernise fishing ports.

4-2 Recommendation

The appropriateness of the Project for grant aid provided by the Government of Japan is confirmed by its significant benefits for the socioeconomic life of Palau as well as by its contribution to the improvement of BHN in Palau. In addition, as the Palau side has sufficient manpower and funds, no specific problems are foreseen in terms of the operation and maintenance of the facilities constructed or installed under the Project. Further improvement of the following issues will, however, ensure the smooth and truly effective implementation of the Project.

(1) In the case of the previous projects, the delay in the installation of watthour meters for users led to unfair collection of the power charge in some areas. Given this lesson, it will be necessary for the Palau side to install a watthour meter for each user prior to the completion of the Project with a view to the fair supply of power. The Palau side is also required to conduct proper meter readings and charge collection in order to establish a fair tariff system following the Project's completion.

(2) While the maintenance workers of the existing power stations in Palau have a certain level of technical expertise to deal with diesel generating units, training is required as far as the latest technologies are concerned. Accordingly, the Palau side should appoint operation and maintenance staff for the new generating units so that they can participate in the OJT to be provided under the Project.

(3) Any delay of the construction work of the new branch distribution lines using the equipment and materials to be provided under the Project will delay the operation of the new transmission and distribution network. In order to ensure the timely completion of the said work within the Project implementation period, the Palau side should organise construction teams together with arrangement of the construction schedule, manpower and procurement plans, backed by appropriate budgetary appropriation.

(4) A total of 22 earthing faults occurred with the existing power network last year, disrupting the stable power supply. In order to reduce or eliminate earthing faults after the Project's completion, the Palau side should conduct regular patrols with a view to implementing preventive maintenance, including the cutting of trees which obstruct the route.

(5) The PUC currently receives a government subsidy for its operation. In order to establish self-supporting operation of power generation and supply, the PUC should consider

making appropriate revisions to its tariff to cover the operation and maintenance and other costs, including the cost of the future replacement of facilities. The introduction of a gradually increasing tariff system, whereby a high level of consumption faces a higher unit charge, should be considered to encourage big consumers to reduce their power consumption while protecting low income families with a lower rate.

(6) The Government of Palau must make the maximum efforts to solve environmental problems involving waste oil and noise, etc. from the existing power generating units at the Malakal Power Station, which the environmental measures are insufficient.

APPENDICES

APPENDIX 1

Member List of the Survey Team

1. Member of the Basic Design Study Team

Name		
Hiromi CHIHARA	Leader	Development Specialist, Institute for International Cooperation, JICA
Yusei ARAKAKI	Technical Councilor	General Manager, Distribution Department, The Okinawa Electric Power Co., Inc.
Yuichi SUGANO	Coordinator	First Project Study Division, Grant Aid Project Study Department, JICA
Mitsuhisa NISHIKAWA	Chief Consultant/Maintenance & Operation Planner	Yachiyo Engineering Co., Ltd.
Masatsugu KOMIYA	Power Generation Planner	Yachiyo Engineering Co., Ltd.
Noritsune CHIBA	Electric Power Supply Planner	Yachiyo Engineering Co., Ltd.
Yutaka MURAKI	Procurement Planner/Cost Estimator	Yachiyo Engineering Co., Ltd.

2. Member of the Explanation Team for the Draft Basic Design

Name		
Hiromi CHIHARA	Leader	Development Specialist, Institute for International Cooperation, JICA
Masahiro ATSUMI	Grant Aid Planner	Grant Aid Division, Bureau of Economic Cooperation, Ministry of Foreign Affairs
Mitsuhisa NISHIKAWA	Chief Consultant/Maintenance & Operation Planner	Yachiyo Engineering Co., Ltd.
Noritsune CHIBA	Electric Power Supply Planner	Yachiyo Engineering Co., Ltd.

APPENDIX 2 Survey Schedule

2. Survey Schedule

(1) Basic Design Study

Date	Activity	Details	Stay
Jun. 30 (Sun.)	Travelling	From Tokyo to Guam (CO 962 10:00 - 15:50)	Guam
Jul. 1 (Mon.)	Courtesy Visit	Consulate General of Japan in Agana	
	Travelling	From Guam to Koror (CO 953 18:15 - 19:15)	Koror
Jul. 2 (Tue.)	Courtesy Visit	President Nakamura, Planning and Statistics Bureau, MRD	
	Discussions on IC/R	Submission and explanation of and discussions on Inception Report; courtesy visit to PUC	Koror
Jul. 3 (Wed.)	Field Survey	Visit to Aimelik Power Station and sites of previous project (Kokusai Substation - Melekeok State)	Koror
Jul. 4 (Thu.)	Field Survey	Visit to Malakal Power Station and discussions on technical issues (PUC Office)	Koror
Jul. 5 (Fri.)	Field Survey	Field reconnaissance in 3 northern states (Ngerchelong, Ngeraard and Ngerdmau) of Babeldaob Island (by boat and car)	Koror
Jul. 6 (Sat.)	Preparation of M/D	Preparation of draft M/D (Minutes of Discussions)	Koror
Jul. 7 (Sun.)	Sorting of Data, etc.	Team discussions; sorting of collected data, etc.	Koror
Jul. 8 (Mon.)	Discussions on M/D	Presentation and explanation of and discussions on draft M/D	Koror
Jul. 9 (Tue.)	Discussions on M/D	Explanation of and discussions on draft M/D; visit to 2 local construction companies (for price quotation, etc.)	Koror
Jul. 10 (Wed.)	Signing of M/D	Revision and signing of M/D	
	Travelling (Mr. Muraki)	From Tokyo to Guam (CO 964 11:55 - 16:25) From Guam to Koror (CO 953 18:15 - 19:15)	Koror
Jul. 11 (Thu.)	Travelling (Govt. Official)	From Koror to Guam (CO 864 14:10 - 17:05)	
	Field Survey (Consultant)	Visit to Malakal Power Station; surveys on equipment, materials, labour and unit cost, etc.	Koror
Jul. 12 (Fri.)	Courtesy Visit	Consulate General of Japan	
	Travelling (Govt. Official)	From Guam to Tokyo (CO 967 16:10 - 19:55)	Return to Japan
	Field Survey (Consultant)	Detailed survey on Malakal Power Station; surveys on equipment, materials, labour and unit cost, etc.	Koror
Jul. 13 (Sat.)	Field Survey	Detailed survey on Aimelik Power Station	Koror
Jul. 14 (Sun.)	Sorting of Data, etc.	Collection and sorting of data, etc; survey on Koror City	Koror
Jul. 15 (Mon.)	Field Survey	Discussions with Planning and Statistics Bureau; Visit to Finance Division and Power Transmission and Distribution Division of PUC	Koror
Jul. 16 (Tue.)	Field Survey	Survey on power line routes (Asahi Substation - Ngerdmau route and existing Ngeremlegui route)	Koror
Jul. 17 (Wed.)	Field Survey	Survey on Ngiwal State	Koror
Jul. 18 (Thu.)	Collection of Data	Collection of data on Compact Road, CIP and Environmental Protection Bureau	Koror
Jul. 19 (Fri.)	Preparation of F/R Field Survey	Preparation of draft Final Report Collection of cost date from local companies	Koror
Jul. 20 (Sat.)	Preparation of F/R	Preparation of draft F/R and sorting of data, etc.	Koror

Date	Activity	Details	Stay
Jul. 21 (Sun.)	Sorting of Data, etc.	Preparation of draft F/R; collecting and sorting of data, etc; survey on Koror City	Koror
	Travelling (Mr. Muraki)	From Koror to Guam (CO 952 10:25 - 14:15) From Guam to Tokyo (CO 967 16:10 - 19:55)	Return to Japan
Jul. 22 (Mon.)	Submission of F/R Technical Survey	Submission and explanation of draft F/R Supplementary survey on Malakal Power Station	Koror
Jul. 23 (Tue.)	Field Survey	Survey on power network and port in Koror	Koror
Jul. 24 (Wed.)	Discussions on F/R	Explanation of and discussions on draft F/R	Koror
Jul. 25 (Thu.)	Approval of F/R	Revision and approval of F/R	Koror
Jul. 26 (Fri.)	Technical Survey	Supplementary survey on design standards, equipment and materials, labour and unit cost, etc.	Koror
	Courtesy Visits	Planning and Statistics Bureau of President's Office, MRD and Public Works Bureau	
Jul. 27 (Sat.)	Sorting of Data, etc.	Sorting of collected data, etc.	Koror
Jul. 28 (Sun.)	Travelling	From Koror to Guam (CO 952 10:25 - 14:15)	Guam
Jul. 29 (Mon.)	Courtesy Visit	Consulate General of Japan	
	Travelling	From Guam to Tokyo (CO 917 NW 63 15:00 - 19:05 via Saipan)	Return to Japan

(2) Explanation for the Draft Basic Design

Date	Activity	Details	Stay
Oct. 13 (Sun.)	Travelling	From Tokyo to Guam (NW060 10:10 - 14:45)	Guam
Oct. 14 (Mon.)	Courtesy Visit	Consulate General of Japan in Agana	
	Travelling	From Guam to Koror (CO953 18:15 - 19:20)	Koror
Oct. 15 (Tue.)	Courtesy Visit	President Nakamura, Planning and Statistics Bureau, MRD, PUC	
	Discussion on D/R	Submission and explanation of and discussions on Draft Report (D/R)	Koror
Oct. 16 (Wed.)	Discussion on D/R	Explanation of and discussions on D/R	Koror
Oct. 17 (Thu.)	Discussion on D/R	Field survey on power line routes (4 northern states of Babeldaob Island)	Koror
Oct. 18 (Fri.)	Field Survey	Survey on Malakal Power Station	
	Discussion on M/D	Preparation of draft M/D	Koror
Oct. 19 (Sat.)	Survey on K-B Bridge	Survey on K-B Bridge	Koror
	Travelling (Mr. Atsumi)	From Koror to Guam (CO864 14:10 - 17:55)	Guam
Oct. 20 (Sun.)	Sorting of Data, etc.	Sorting of collected data, etc.	Koror
Oct. 21 (Mon.)	Discussion on M/D	Submission and explanation on draft Minutes of Discussions (M/D)	
	Signing of M/D	Signing of M/D and Courtesy Visit	Koror
Oct. 22 (Tue.)	Travelling	From Koror to Guam (CO864 14:10 - 17:05)	Guam
Oct. 23 (Wed.)	Courtesy Visit	Consulate General of Japan in Agana	
	Travelling	From Guam to Tokyo (JL942 15:20 - 17:55)	Return to Japan

APPENDIX 3

List of Party Concerned in the Recipient Country

Appendix 3 List of Party Concerned in the Recipient Country

President House	
President	H.E. Kunio Nakamura
Office of Planning and Statistics	
National Planner	Mr. Koichi L. Won
Ministry of Resources and Development	
Minister	Mr. Marcelino Melairei
Technical Advisor	Mr. Richard Mangham
Environment Consultant	Mr. Marhane Madranchar
Cost Investment Project (CIP)/Design Engineering Office	
Manager	Mr. Masashinge Arwany
Engineer	Mr. Mark Braccia
Ministry of State	
Minister	Mr. Andres Uhebelau
Director of Bureau of Foreign Affairs	Mr. Steven Kanai
Protocol Section	Mr. Dani Higo
Protocol Section	Mr. Sakura
Babeldaob Road Project	
Coordinator	Mr. Laurentno Uleutoney
Public Utility Board (PUC)	
Chairman of PUC	Mr. August Remoket
Co-Manager, Technical	Mr. Regis Akitaya
Co-Manager, Finance	Ms. Arukbai K. Inabo
Power Generating Division	
Manager	Mr. Lorenzo Maimis
Assistant Manager	Mr. Andy Finnery
Chief Engineer of Maintenance Section	Mr. Nestor V. Collado
Manager of Malakal Power Station	Mr. Kanguichi Uhau
Power Distribution Division	
Manager	Mr. Ipolito Aquon
Equipment Operator	Mr. Authonio Riumd
Engineering & Construction Division	
Training & Safety Officer	Mr. Paul Ueki

Ngarchelong State	
Governor	Mr. Rudimch Titiml
Power Plant Operator	Mr. Lorenzo Ngiramolau
Ngaraard State	
Governor	Mr. Tadashi Sakumo
Consultant of Governor	Mr. Jonathan Maui
Power Plant Operator	Mr. Allen Maui
Ngerdmau State	
Governor	Mr. John K. Rechucher
Ngiwal State	
Governor	Mr. August Ngirameketii
Ngeremlegui State	
Governor	Mr. John Skebong
Environment Quality Protection Board (EQPB)	
Assistant Attorney General	Mr. Todo M. Musheff, Esg.
Assistant Executive Officer	Mr. Lucio Abraham
Environmental Engineer	Mr. Eric Burneson
Guam International Trade Center	
Consulate-General of Japan	Mr. Takashi Matsumura

APPENDIX 4

Minutes of Discussion

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY ON THE PROJECT FOR UPGRADING OF ELECTRIC POWER SUPPLY AND POWER TRANSMISSION LINES IN BABELDAOB ISLAND IN THE REPUBLIC OF PALAU

In response to a request from the Government of the Republic of Palau, the Government of Japan decided to conduct a basic design study on the Project for Upgrading of Electric Power Supply and Power Transmission Lines in Babeldaob Island (hereinafter referred to as "the Project") and entrusted the study to Japan International Cooperation Agency (JICA).

JICA has sent to Palau a study team, which is headed by Mr. Hiromi CHIHARA, Senior Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from July 1 to 28, 1996.

The team held discussions with the officials concerned of the Government of Palau and conducted a field survey at the study area.

In the course of the discussions and field survey, both parties have confirmed the main items described on the attached sheets. The team will proceed to further works and prepare the Basic Design Study report.

Koror, July 10, 1996

Mr. Hiromi CHIHARA
Leader
Basic Design Study Team
JICA

Mr. Marcelino MELAIREI
Minister of Resources and Development
The Republic of Palau

Mr. Koichi L. WONG
National Planner
Office of Planning & Statistics
The Republic of Palau

ATTACHMENT

1. Title of the Project

The official title of the Project is **Upgrading of Electric Power Supply and Power Transmission Lines in Babeldaob Island in the Republic of Palau.**

2. Objective

The objective of the Project is to improve the power generation capacities which will be sufficient for the government central system and to supply electricity from the Governmental central power grid to the northern four states, i.e. Ngiwal, Ngaraard, Ngardmau and Ngarchelong, in Babeldaob island by constructing and procurement of the necessary facilities and equipment.

3. Project Site

The Project sites are northern four (4) states of Babeldaob island for the construction of new power transmission and distribution lines and the existing Malakal power plant for upgrading of power generation capacities. The location of the Project sites are shown in Annex-I.

4. Responsible and Implementing Agencies

The Ministry of Resources and Development (MRD) is responsible for the administration and execution of the Project. The organization of MRD is shown in Annex-II.

5. Items requested by the Palau side

After discussion with the Basic Study Team, the following items were finally requested by the Palau side.

(1) Construction of new transmission and distribution lines in Babeldaob island
Supply and install the required equipment and materials for 34.5 kV transmission and 13.8 kV distribution lines including necessary substations from the existing line to northern four (4) states of Babeldaob island, which are not electrified yet from the central power supply system.

(2) Upgrading of Malakal power plant as base load power station
1) Supply and install of the medium speed, continues operating diesel engine generator with total output capacity of approximately 5 MW (one set or two identical ones) including the required electrical and mechanical auxiliary equipment such as exhaust system, cooling water system, air starting system, fuel oil system, etc. (DEG set) at Malakal power plant.
2) Construction of a power house building or enclosure and equipment foundations necessary for DEG set including building services and incidental facilities at Malakal power plant.

However, final items to be constructed and procured under Japan's Grant Aid will be decided after further studies in Japan, taking account of :
- existing conditions of power generation and power transmission & distribution lines
- power demand forecast
- operation and maintenance capability of the executing authority
- economic and administrative viability of the Project

6. Japan's Grant Aid System

(1) The Government of Palau has understood the system of Japan's Grant Aid explained by the Team, as described in Annex-III.

(2) The Government of Palau will take necessary measures, as described in Annex-IV, for smooth implementation of the Project, on condition that the Grant Aid by the Government of Japan is extended to the Project.

7. Schedule of the Study

(1) The consultants will proceed to further studies in Palau until July 28, 1996.

(2) Based on the Minutes of Discussions and technical examination of the study results, JICA will prepare a draft basic design study report and dispatch a mission to Palau in order to explain its contents to the Palau side in around the middle of October,1996.

(3) In case that the contents of the draft report are accepted in principal by the Government of Palau, JICA will complete the final report and send it to the Government of Palau by the end of January 1997.

8. Other relevant issues

(1) Management, operation and maintenance of the facilities and equipment of the Project.
After the completion of the Project, the Palau Utility Corporation (PUC) is in charge of the management, operation and maintenance of the facilities, equipment and materials constructed and procured by the Project under the supervision of the MRD.

(2) Upgrading the Aimeliik Power Station
After discussions about the present technical, financial and administrative conditions likely to be imposed on the facilities and equipment of the Aimeliik Power Station, it was mutually agreed upon that this component of the Project originally requested would not be considered due to inadequacy for qualifying as the project for the Japan's Grant Aid assistance.

(3) Upgrading the Malakal Power Station

1) The total output to be installed has been estimated based on the power demand forecast envisaged at the time of the year 2000 and present yearly growth of the power demand, and an urgency for mitigating deteriorating power supply capability at the station.

2) Palau side desired that two (2) identical units be considered for the following reasons specific to the Palau situations:

- Palau is relatively isolated and far away from industrialized countries where spare parts for machinery could be obtained. Transportation between Palau and such countries is infrequent, and it takes much waiting time for spare parts to arrive after placement of a purchase order.
- From service reliability point of view, two identical units would provide better flexibility of operation resulting in a more reliable service.

However, the team replied that number of DEG set is decided by the results of the further study in Japan.

(4) Location of new DEG set at Malakal power plant

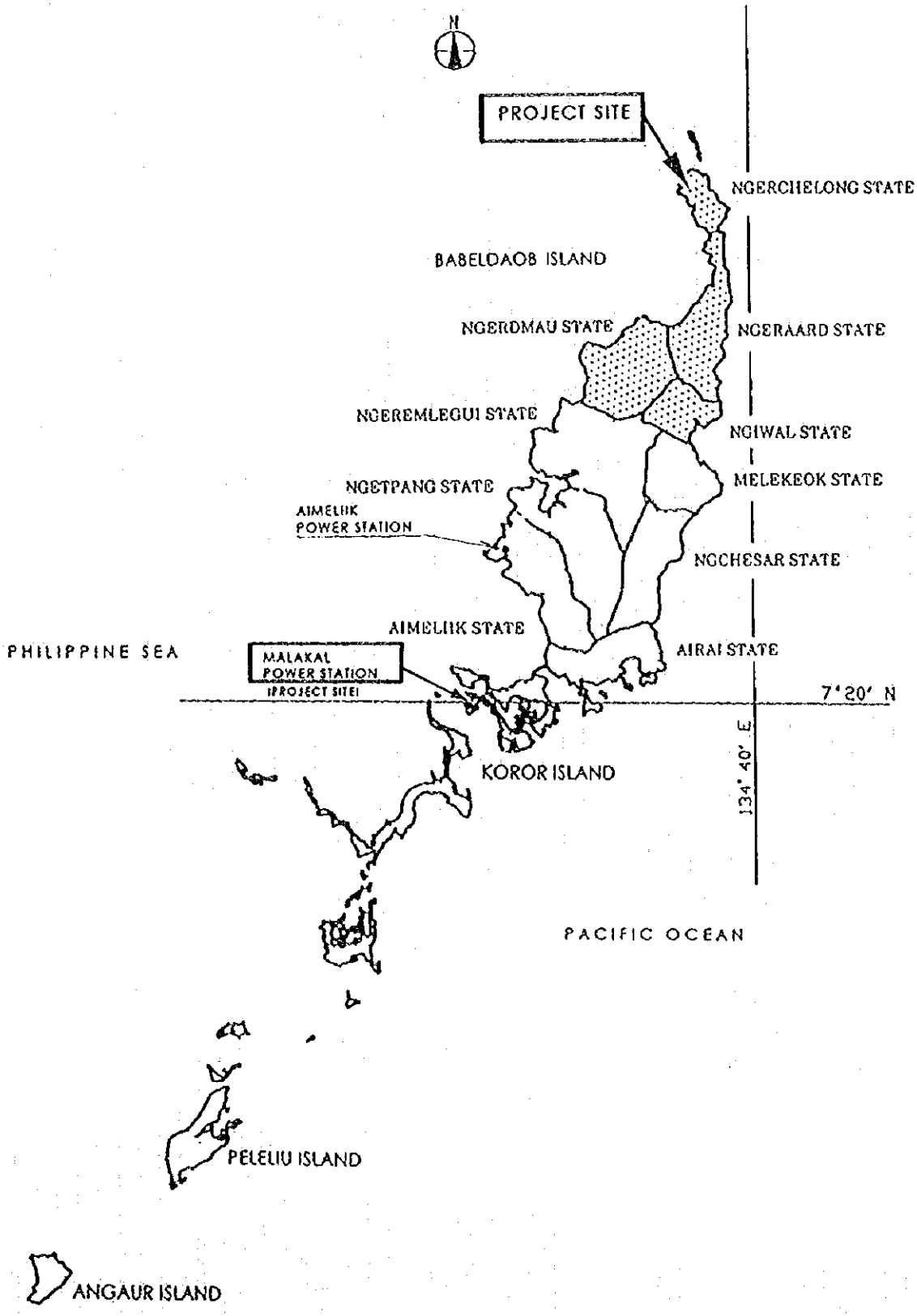
After discussions, both parties have confirmed that new DEG set will be installed at the existing workshop area which located at the next of the existing deration of the power plant building. Also, the Palau side has agreed to demolish the existing workshop building and specified at foundations, and to make cleared and leveled land for the Project by his own cost prior to the commencement of the construction for the Project.

(5) Construction of the road from Asahi substation to Ngardmau state

1) After discussions, both parties have confirmed that the route from the existing Asahi substation to Ngaraard state through Ngardmau state will be most appropriate for 34.5 kV through the causeway in Melekeok state.
Regarding the route between the Asahi substation to Ngardmau state which road is not available for the construction for the transmission line at present, the Palau side agreed to complete the road construction work and the topographic survey prior to the commencement of the detailed design for the Project.
The detailed design shall be well coordinated with the Compact Road Project.

2) The materials for power poles will be selected by taking into consideration the existing installation and natural conditions such as a salt laden atmospheric and other conditions in Palau.

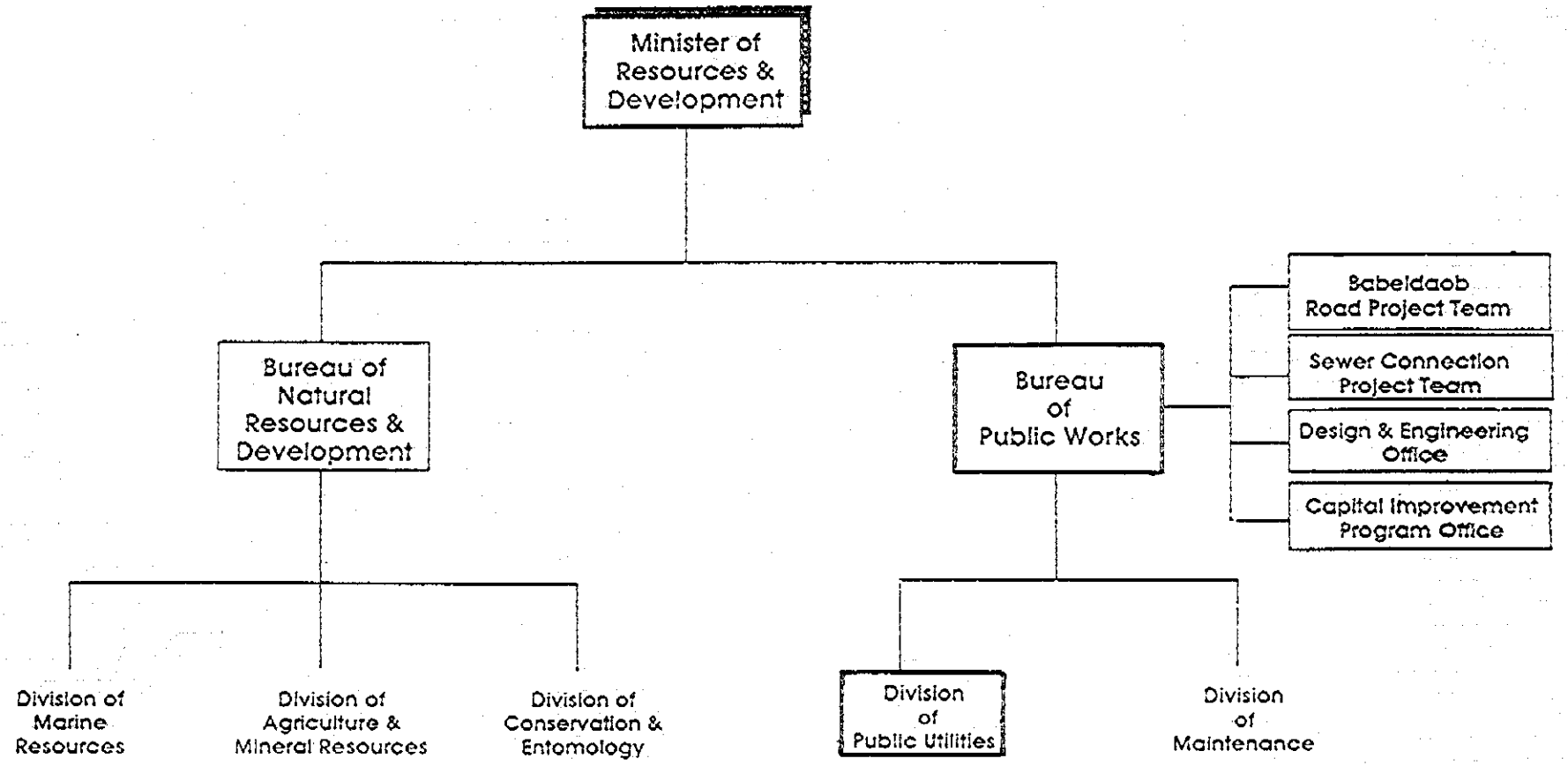
Annex-I Project Site



Annex-II

MINISTRY OF RESOURCES & DEVELOPMENT

ORGANIZATIONAL STRUCTURE



Annex-III Japan's Grant Aid Scheme

Japan's Grant Aid Scheme

1. Grant Aid Procedures

(1) Japan's Grant Aid Program is executed through the following procedures.

Application	(Request made by a recipient country)
Study	(Basic Design Study conducted by JICA)
Appraisal & Approval	(Appraisal by the Government of Japan and Approval by Cabinet)
Determination of Implementation	(The Notes exchanged between the Governments of Japan and the recipient country)

(2) Firstly, the application or request for a Grant Aid project submitted by a recipient country is examined by the Government of Japan (the Ministry of Foreign Affairs) to determine whether or not it is eligible for Grant Aid. If the request is deemed appropriate, the Government of Japan assigns JICA (Japan International Cooperation Agency) to conduct a study on the request.
Secondly, JICA conducts the study (Basic Design Study), using (a) Japanese consulting firm(s).
Thirdly, the Government of Japan appraises the project to see whether or not it is suitable for Japan's Grant Aid Program, based on the Basic Design Study report prepared by JICA, and the results are then submitted to the Cabinet for approval.
Fourthly, the project, once approved by the Cabinet, becomes official with the Exchange of Notes signed by the Governments of Japan and the recipient country.
Finally, for the implementation of the project, JICA assists the recipient country in such matters as preparing tenders, contracts and so on.

2. Basic Design Study

(1) Contents of the Study
The aim of the Basic Design Study (hereinafter referred to as "the Study"), conducted by JICA on a requested project (hereinafter referred to as "the Project") is to provide a basic document necessary for the appraisal of the Project by the Japanese Government. The contents of the Study are as follows:

a) Confirmation of the background, objectives, and benefits of the requested project and also institutional capacity of agencies concerned of the recipient country necessary for the Project's implementation.
b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
c) Confirmation of items agreed on by both parties concerning the basic concept of the Project.
d) Preparation of a basic design of the Project
e) Estimation of costs of the Project

The contents of the original request are not necessarily approved in their initial form as the contents of the Grant Aid project. The Basic Design of the Project is confirmed considering the guidelines of Japan's Grant Aid Scheme.
The Government of Japan requests the Government of the recipient country to take whatever measures are necessary to ensure its self-reliance in the implementation of the Project. Such measures must be guaranteed even though they may fall outside of the jurisdiction of the organization in the recipient country actually implementing the Project. Therefore, the implementation of the Project is confirmed by all relevant organizations of the recipient country through the Minutes of Discussions.

(2) Selection of Consultants
For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.
The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

3. Japan's Grant Aid Scheme

(1) What is Grant Aid?
The Grant Aid Program provides a recipient country with non-reimbursable funds to procure the facilities, equipment and services (engineering services and transportation of the products, etc.) for economic and social development of the country under principles in accordance with the relevant laws and regulations of Japan. Grant Aid is not supplied through the donation of materials as such.

(2) Exchange of Notes (E/N)
Japan's Grant Aid is extended in accordance with the Notes exchanged by the two Governments concerned, in which the objectives of the Project, period of execution, conditions and amount of the Grant Aid, etc., are confirmed.

(3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.
However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.
When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.
However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(5) Necessity of "Verification"
The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(6) Undertakings required of the Government of the Recipient Country
In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:
1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
3) To secure buildings prior to the procurement in case the installation of the equipment.

4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) "Proper Use"
The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(8) "Re-export"
The products purchased under the Grant Aid should not be re-exported from the recipient country.

(9) Banking Arrangements (B/A)
1) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
2) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

Annex-IV Necessary measures to be taken by the Government of the Republic of Palau on condition that Japan's Grant Aid is extended.

1. To Provide necessary data and information for the Project.

2. To ensure speedy unloading and customs clearance of the goods for the Project at port and /or of disembarkation in the Republic of Palau.

3. To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contract(s) such facilities as may be necessary for their entry into the Republic of Palau and stay therein for the performance of their work.

4. To exempt Japanese nationals from custom duties, internal taxes and other fiscal levies which may be imposed in the Republic of Palau with respect to the supply of the products and services under the verified Contracts. And to take necessary measures for such tax exemption.

5. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the banking arrangement.

6. To bear all the expenses other than those to be borne by the Grant Aid necessary for the execution of the Project.

7. To assign exclusive counterpart engineers and technicians to the Project in order to transfer the operation and maintenance technique for the Project and to witness and confirm construction works and qualities of equipment and materials when inspection is carried out.

8. To use and maintain properly and effectively all the facilities constructed and equipment and materials purchased under the Japan's Grant Aid.

9. To secure and provide cleared, embanked, leveled land and access road for Malakal power plant as well as the securing of roads and the cutting of trees necessary for the construction of power transmission and distribution lines, prior to the commencement of the construction for the Project.

10. To construct incidental outdoor facilities, boundary fence and entrance gate at Malakal power plant by the completion of the construction for the Project.

11. To procure and to install the equipment and materials for low voltage distribution lines including household panels, watt-hour meters, street lighting and their grounding system in accordance with proper implementation schedule to meet the requirements of the Japan's Grant Aid.

12. To take necessary measure for the prevention of the environment pollution such as disposal of oil sludge, etc.

13. To take necessary measures for improvement of the tariff system in order to maintain the sustainable operation of the public power supply system.

14. To provide proper disposal places of excavated soil, waste water and oil discharged during the implementation period.

MINUTES OF DISCUSSIONS

BASIC DESIGN STUDY
ON
THE PROJECT
FOR
UPGRADING OF ELECTRIC POWER SUPPLY
AND
POWER TRANSMISSION LINES ON BABELDAOB ISLAND
IN
THE REPUBLIC OF PALAU
(CONSULTATION ON DRAFT REPORT)

In July 1996, the Japan International Cooperation Agency (JICA) dispatched a Basic Design Study Team on the Project for Upgrading of Electric Power Supply and Power Transmission Lines on Babeldaob Island (hereinafter referred to as "the Project") to the Republic of Palau, and through discussions, field survey, and technical examination of the results in Japan, has prepared the draft report of the Study.

In order to explain and to consult the Palau side on components of the draft report, JICA sent to Palau a study team, which is headed by Mr. Hiromi CHIHARA, Senior Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from October 14 to 22, 1996.

As a result of discussions, both parties confirmed the main items described on the attached sheets.

Koror, October 21, 1996

Mr. Hiromi CHIHARA
Leader
Basic Design Study Team
JICA

Mr. Marcelino MELAIREI
Minister of Resources and Development
The Republic of Palau

Mr. Koichi L. WONG
National Planner
Office of Planning & Statistics
The Republic of Palau

ATTACHMENT

1. Components of the Draft Report

The Government of Palau has agreed and accepted in principle the components of the Draft Report proposed by the Team.

2. Japan's Grant Aid System

(1) The Government of Palau has understood the system of Japan's Grant Aid explained by the Team, as described in Annex-I.

(2) The Government of Palau will take necessary measures, as described in Annex-II, for smooth implementation of the Project, on condition that the Grant Aid assistance by the Government of Japan is extended to the Project.

3. Further schedule

The Team will make the final report in accordance with the confirmed items, and send it to the Government of Palau by the end of January 1997.

4. Other relevant issues

(1) The Palau side proposed that a route of the connecting road for the power transmission line from Asahi substation to Ngardmau state will be changed because the original route travels along a ridge line and includes many steep slopes. The Team agreed to modify a related route based on a new route of the connecting road.

(2) The Palau side was requested to re-confirm the routes of the existing roads by examining the road map prepared by the Team, which will be used for the power transmission and distribution lines for the Project and the Palau side agreed to do so by the end of October 1996.

Annex-I Japan's Grant Aid Scheme

Japan's Grant Aid Scheme

1. Grant Aid Procedures

(1) Japan's Grant Aid Program is executed through the following procedures.

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b) Evaluation of the appropriateness of the Project to be implemented under the Grant Aid Scheme from a technical, social and economic point of view.
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(2) Selection of Consultants
For smooth implementation of the Study, JICA uses (a) registered consultant firm(s). JICA selects (a) firms(s) based on proposals submitted by interested firms. The firm(s) selected carry(ies) out a Basic Design Study and write(s) a report, based upon terms of reference set by JICA.
The consulting firm(s) used for the Study is(are) recommended by JICA to the recipient country to also work on the Project's implementation after the Exchange of Notes, in order to maintain technical consistency and also to avoid any undue delay in implementation should the selection process be repeated.

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(3) "The period of the Grant Aid" means the one fiscal year which the Cabinet approves the Project for. Within the fiscal year, all procedures such as exchanging of the Notes, concluding contracts with (a) consultant firm(s) and (a) contractor(s) and final payment to them must be completed.
However in case of delays in delivery, installation or construction due to unforeseen factors such as weather, the period of the Grant Aid can be further extended for a maximum of one fiscal year at most by mutual agreement between the two Governments.

(4) Under the Grant Aid, in principle, Japanese products and services including transport or those of the recipient country are to be purchased.
When the two Governments deem it necessary, the Grant Aid may be used for the purchase of the products or services of a third country.
However the prime contractors, namely, consulting, contracting and procurement firms, are limited to "Japanese nationals". (The term "Japanese nationals" means persons of Japanese nationality or Japanese corporations controlled by persons of Japanese nationality.)

(5) Necessity of "Verification"
The Government of recipient country or its designated authority will conclude contracts denominated in Japanese yen with Japanese nationals. Those contracts shall be verified by the Government of Japan. This "Verification" is deemed necessary to secure accountability to Japanese taxpayers.

(6) Undertakings required of the Government of the Recipient Country
In the implementation of the Grant Aid project, the recipient country is required to undertake such necessary measures as the following:
1) To secure land necessary for the sites of the Project and to clear, level and reclaim the land prior to commencement of the construction.
2) To provide facilities for the distribution of electricity, water supply and drainage and other incidental facilities in and around the sites.
3) To secure buildings prior to the procurement in case the installation of the equipment.

4) To ensure all the expenses and prompt execution for unloading, customs clearance at the port of disembarkation and internal transportation of the products purchased under the Grant Aid.
5) To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which will be imposed in the recipient country with respect to the supply of the products and services under the Verified Contracts.
6) To accord Japanese nationals whose services may be required in connection with the supply of the products and services under the Verified Contracts, such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.

(7) "Proper Use"
The recipient country is required to maintain and use the facilities constructed and equipment purchased under the Grant Aid properly and effectively and to assign staff necessary for this operation and maintenance as well as to bear all the expenses other than those covered by the Grant Aid.

(8) "Re-export"
The products purchased under the Grant Aid should not be re-exported from the recipient country.

(9) Banking Arrangements (B/A)
1) The Government of the recipient country or its designated authority should open an account in the name of the Government of the recipient country in an authorized foreign exchange bank in Japan (hereinafter referred to as "the Bank"). The Government of Japan will execute the Grant Aid by making payments in Japanese yen to cover the obligations incurred by the Government of the recipient country or its designated authority under the Verified Contracts.
2) The payments will be made when payment requests are presented by the Bank to the Government of Japan under an authorization to pay issued by the Government of the recipient country or its designated authority.

Annex-II Necessary measures to be taken by the Government of the Republic of Palau on condition that Japan's Grant Aid is extended to the Project.

1. To Provide necessary data and information for the Project.

2. To ensure speedy unloading and customs clearance of the goods for the Project at port and /or of disembarkation in the Republic of Palau.

3. To accord Japanese nationals whose services may be required in connection with the supply of products and services under the verified contract(s) such facilities as may be necessary for their entry into the Republic of Palau and stay therein for the performance of their work.

4. To exempt Japanese nationals from custom duties, internal taxes and other fiscal levies which may be imposed in the Republic of Palau with respect to the supply of the products and services under the verified Contracts and to take necessary measures for such tax exemption.

5. To bear commissions to the Japanese foreign exchange bank for the banking services based upon the banking arrangement.

6. To bear all the expenses other than those to be borne by the Grant Aid necessary for the execution of the Project.

7. To assign exclusive counterpart engineers and technicians to the Project in order to transfer the operation and maintenance technique for the Project and to witness and confirm construction works and qualities of equipment and materials when inspection is carried out.

8. To use and maintain properly and effectively all the facilities constructed and equipment and materials purchased under the Japan's Grant Aid.

9. To secure and provide cleared, embanked, leveled land and access road for Malakal power plant as well as the securing and graveling of roads and the cutting of trees, reinforcement of existing bridges necessary for the construction of power transmission and distribution lines, prior to the commencement of the construction for the Project.

10. To construct incidental outdoor facilities, boundary fence and entrance gate at Malakal power plant by the completion of the construction for the Project.

11. To secure and to provide temporary areas for the site office, storage ,shops and accommodations necessary for the construction of power transmission and distribution lines and the generating facilities by the Japanese contractor(s).

12. To transport from local ports to construction sites and to install the equipment and materials supplied by the Japan's Grant Aid for branch power distribution lines(13.8 kV) in accordance with the design drawings prepared by the Japanese side and the proper implementation schedule to meet the requirements of the Japan's Grant Aid.

13. To procure and to install the equipment and materials for low voltage distribution lines including household panels, watt-hour meters, street lighting and their grounding system in accordance with proper implementation schedule to meet the requirements of the Japan's Grant Aid.

14. To take necessary measure for the prevention of the environment pollution such as disposal of oil sludge, etc.

15. To take necessary measures for improvement of the tariff system in order to maintain the

sustainable operation of the public power supply system.

16. To provide proper disposal places of excavated soil, waste water and oil discharged during the implementation period.

17. To secure the stoppage electricity of the existing substation at Malakal power plant during the connection works of new power and control cables under the Project, when necessary.

18. To arrange necessary traffic control when equipment and materials under the Project are transported from the port(s) to the Project site(s).

19. To relocate the existing switchgears and control panels for the existing aged diesel engine generators (No.1,3,5 and 6) in the control room at Malakal power plant, in order to install a new remote control panel under the Project.

APPENDIX 5

Cost Estimation Borne by the Recipient Country

5. Cost Estimation Borne by the Recipient countryConstruction Cost to be Borne by Palau Side

Main items of the construction cost to be borne by Palau side are as follows:

1. Malakal Power Station

1.1 Demolishing Work of the Existing Workshop
$160m^2 \times 30$ US$/$m^2$ 4,800 US$

1.2 Site Leveling Work
(including the existing workshop area)

$2,000m^2 \times 2$US$/$m^2$ ≒ 4,000 US$

2. Distribution Line

2.1 Construction Work of 13.8kV Distribution Line

23 km × 1,500,000 $/km ≒ 330,000 US$

(Total 338,800 US$)


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