

資料－1 調査団員・氏名

1. 基本設計調査

氏名	担当業務	現職
丹羽 顯	総括	JICA国際協力総合研修所
松下 雄一	計画管理	JICA無償資金協力部業務第三課
西川 光久	業務主任/運営維持管理計画	八千代エンジニアリング(株)
瀬戸 寛仁	発電計画	八千代エンジニアリング(株)
村木 裕	送配電計画	八千代エンジニアリング(株)
小宮 雅嗣	調達計画/積算	八千代エンジニアリング(株)

2. 基本設計概要現地説明調査

氏名	担当業務	現職
塩野 広司	総括	JICA筑波国際センター業務第1課
西川 光久	業務主任/運営維持管理計画	八千代エンジニアリング(株)
瀬戸 寛仁	発電計画	八千代エンジニアリング(株)
村木 裕	送配電計画	八千代エンジニアリング(株)

資料－2 調査行程

1. 基本設計調査

No.	月日	曜日	調査内容		宿泊地
			官ベース	コンサルタント	
1	11/11	土	-移動[東京(21:45)～JL771～]		機中
2	11/12	日	-移動[(08:45+1) シドニー(14:50)～FJ910～(19:40)ナンディ]		ナンディ
3	11/13	月	-移動[ナンディ(08:45)～PC136～(09:10)スバ -在フィジー-日本国大使館及び JICA 事務所表敬訪問、調査内容説明 -移動[スバ(16:30)～PC171～(16:55)ナンディ]		ナンディ
4	11/14	火	-移動[ナンディ(07:20)～ON222～(10:20)タラワ] -PM:公共事業・エネルギー省(MWE)及び公共事業公社(PUB)表敬		タラワ
5	11/15	水	-インゼプション・レポート、調査内容、日程、便宜供与等の説明・協議		タラワ
6	11/16	木	-発電所予定地点（既設ビケハウ発電所）、既存ベシ発電所及び 11 kV 配電線路調査		タラワ
7	11/17	金	-インゼプション・レポート、無償資金協力の制度及びシステムの詳細説明・協議 -北タラワの太陽光発電施設視察		北タラワ
8	11/18	土	-北タラワの太陽光発電施設視察		タラワ
9	11/19	日	-収集資料整理・解析および団内協議		タラワ
10	11/20	月	-主要計画内容(Main Project Components)の協議		タラワ
11	11/21	火	-M/D（案）の説明・協議（MWE 及び PUB）		タラワ
12	11/22	水	-M/D 署名（MWE 及び PUB）		タラワ
13	11/23	木	-移動[タラワ(07:45)～ON141～(10:45)ナンディ] -移動(ナンディ→スバ：車) -在フィジー-日本国大使館および JICA 事務所表敬訪問	-現地調査日程の確認 -質問表の協議	官団員:スバ コンサル: タラワ
14	11/24	金	-移動[スバ(06:45)～PC133～(07:15)ナンディ] -移動[ナンディ(08:20)～NZ045～オークランド(12:25)]	-PUB にて電力事情調査 -積算関連調査	官団員: オークランド コンサル: タラワ
15	11/25	土	-移動[オークランド(12:15)～JL099～(19:10)オークランド]	-既存 11 kV 配電線路の詳細調査	官団員: 帰国 コンサル: タラワ
16	11/26	日	-収集資料整理・解析及び団内協議		タラワ
17	11/27	月	-発電所用地概略測量、コースウェイ詳細調査		タラワ
18	11/28	火	-環境省及び港湾局にて情報収集 -フィールドレポートの作成		タラワ
19	11/29	水	-他援助国、機関の動向調査 -フィールドレポートの作成		タラワ

No.	月日	曜日	調査内容		宿泊地
			官ベース	コンサルタント	
20	11/30	木		-将来計画に係る調査 -フィールドレポートの作成	タラワ
21	12/1	金		-既存発電所及び配電網の運転・維持管理の現況調査 -フィールドレポートの提出・説明（第1章）	タラワ
22	12/2	土		-市場調査 -フィールドレポートの作成	タラワ
23	12/3	日		-収集資料整理・解析及び団内協議	タラワ
24	12/4	月		-新設配電線路のルート確認（マイク地区） -質問表の協議・確認 -環境省訪問・法規確認	タラワ
25	12/5	火		-PUB 維持管理体制確認 -内務省訪問（土地利用関連法規確認） -小宮団員タラワ着	タラワ
26	12/6	水		-AusAID 援助内容確認 -資機材及び積算関連調査 -ビケベウ発電所補足調査	タラワ
27	12/7	木		-フィールドレポートの作成 -PUB 財務諸表入手	タラワ
28	12/8	金		-フィールドレポートの提出・協議 -資機材及び積算関連調査	タラワ
29	12/9	土		-配電線路補足調査	タラワ
30	12/10	日		-団内協議及び市場調査	タラワ
31	12/11	月		-ベシヨ及びビケベウ発電所補足調査	タラワ
32	12/12	火		-フィールドレポートの説明・協議	タラワ
33	12/13	水		-AM:フィールドレポートの承認取得 -PM:MWE 及び PUB 表敬	タラワ
34	12/14	木		-移動[タラワ(07:45)～ON141～(10:45)ナンディ]	ナンディ
35	12/15	金		-移動[ナンディ～車～スバ] -在フィジー-日本国大使館及び JICA フィジー-事務所への調査結果概要報告 -移動[スバ～車～ナンディ]	ナンディ
36	12/16	土		-移動[ナンディ(12:00)～QF398～(14:00)ブリスバーン]	ブリスバーン
37	12/17	日		-移動[ブリスバーン(09:30)～JL762～(17:20)東京]	帰国

2. 基本設計概要説明調査

No.	月日	曜日	調査内容		宿泊地
			官ベース	コンサルタント	
1	2/17	土	移動[東京(21:00)～JL771～]		機中
2	2/18	日	移動[(08:30+1) シドニー(14:50)～QF391～(19:50) ナンディ]		ナンディ
3	2/19	月	移動[ナンディ(11:30)～PC152～(12:00)スバ] -在フィジー日本国大使館及び JICA 事務所表敬訪問、調査内容説明 移動[スバ(16:30)～PC171～(16:55)ナンディ]		ナンディ
4	2/20	火	-団内協議		ナンディ
5	2/21	水	-団内協議		ナンディ
6	2/22	木	-団内協議		ナンディ
7	2/23	金	移動[ナンディ(12:00)～FJ2221～(15:00)タラワ] -公共事業公社(PUB)表敬 -調査日程の確認		タラワ
8	2/24	土	-公共事業エネルギー省(MWE)表敬 -基本設計報告書(案)の説明・協議 (MWE、PUB 及び Attorney General (AG)) -無償資金協力の制度及びシステムおよび工程の説明・協議 (MWE 及び PUB) -団内打ち合わせ及び M/D (案) の作成 -本計画対象地域の調査 (バシオ、ビケニベウ発電所及び配電網)		タラワ
9	2/25	日	-本計画対象地域の調査 (配電網)		タラワ
10	2/26	月	- M/D (案) の協議 (MWE、PUB および AG) - M/D 署名 (MWE 及び PUB)		タラワ
11	2/27	火	-調査日程の確認 -機材仕様書(案)の説明・協議		タラワ
12	2/28	水	移動 [タラワ (08:30)～ FJ2220～ (11:30) ナンディ]	-機材仕様書(案)の説明・協議 -本計画対象地域 (発電所・配電網) の再確認 (PUB)	官団員:ナンディ コンサル:タラワ
13	3/1	木	-移動 [ナンディ (10:25)～ FJ302～ (16:55) 東京]	-機材仕様書(案)の説明・協議 -AusAID の Phase-2 の内容聞き取り調査	官団員:帰国 コンサル:タラワ
14	3/2	金	-機材仕様書(案)の説明・協議 -「キ」国側負担の 415 V 配電工事に係る予算措置に係る手続き確認		タラワ
15	3/3	土	-本計画対象地域 (配電網) の再確認		タラワ
16	3/4	日	-団内打ち合わせ及び PUB との協議内容整理		タラワ
17	3/5	月	-機材仕様書(案)の最終確認		タラワ
18	3/6	火	-既存発電及び配電設備の現状再確認		タラワ
19	3/7	水	-環境影響評価チームに本計画の説明・協議 -公共事業エネルギー省(MWE)及び公共事業公社 (PUB)表敬		タラワ
20	3/8	木	-団内打ち合わせ及び PUB/MESD との協議内容整理		タラワ
21	3/9	金	移動[タラワ(11:00)～FJ2220～(14:00) ナンディ]		ナンディ
22	3/10	土	-在フィジー JICA 事務所表敬訪問、調査概要報告 (車で移動)		ナンディ
23	3/11	日	移動[ナンディ(15:05)～FJ921～(17:00) ブリスベーン]		ブリスベーン
24	3/12	月	移動[ブリスベーン(09:30)～JL762～(17:20)東京]		東京

資料－3 関係者(面会者)リスト

関係者(面談者)リスト

<u>所属及び氏名</u>	<u>職位</u>
公共事業エネルギー省 (Ministry of Works and Energy: MWE)	
Hon. Teaiwa Tenieu	Minister
Mr. Francis Ngalu	Permanent Secretary
Mr. Ruatu Bweuo	Deputy Secretary
Mr. Mautaaake Tannang	Acting Energy Planning, EIA Team Member
Mr. Kireua B. Kaiea	Assistant Energy Planner
Mr. Titaake Binataake	Quantity Surveyor: Public work section
Mr. Ienimoa Katia	EIA Team Member
公共事業公社 (Public Utility Boards: PUB)	
Mr. Tokia Greig	Chief Executive Officer
Mr. Buibui Tiweri	Manager, Power Engineering
Mr. Moten Naari	Mechanical Engineer: Betio P/S
Mr. Takabwere Arinoko	Mechanical Engineer: Bikenibeu P/S
Mr. Kiriati Biritia	Electrical Engineer: Distribution, EIA Team Member
Mr. Baikia Nauoko	Electrician: Distribution
Ms. Kirita Biribo	CEO Assistance
Ms. Janet Kantabuki	EIA Team Member
Mr. Tetangare Teinai	Finance Manager
Mr. Toani Naateke	Electrical Draught man
Mr. Taboia Metutera	Manager, Water Engineering
Mr. Riteti Eritama	Water Sewerage Engineer
Mr. Teawaki Mackenzie	Foreman Inspection
大蔵経済計画省 (Ministry of Finance & Economic Planning: MFEP)	
Mr. Bureti Williams	Permanent Secretary (National Authorizing Officer of EU)
Mr. Peter Toall	Director of National Economic Planning (NEP)
Mr. Tekeraoi Nangka	Economist: Aid Coordination: NEP Officer
Mr. Teiwaki Teiwaki	Deputy Census Commissioner, Statistics Dept.
環境・社会開発省 (Ministry of Environment and Social Development: MESD)	
Mr. Michael Phillips	EIA Team Leader
Mr. Michael Taing	EIA Team Member
Mr. Kautu Temakei	Officer
Mr. Moreti Tibiriano	MET Service
Public Prosecutor Attorney General Office	
Mr. Titabu Tabane	Director
Ministry of Home Affairs (MHA)	
Mr. Tebutonga Ereate	Chief Lands Surveyor of Land Management Division
Australian High Commission Tarawa (Australian Agency for International Development: AusAID)	
Mr. Colin Hill	High Commissioner
Mr. Nigel Ewels	First Secretary: Development Assistance
Kiribati Oil Company LTD. (KOIL)	
Mr. James Redfern	Acting Chief Executive Officer
Mr. Teauoki Tonako	Administration and Personnel Manager
Australian Power & Water Pty Ltd.	
Mr. Denis Johnstone	Senior Electrical Engineer

Solar Energy Company (SEC)

Mr. Terubentau Akura
Ms. Tahirih Pedro Tuare
Mr. Teikona Toamannang

Manager
Deputy General Manager
Utility Supervisor and Technician

Telecommunication Services of Kiribati Ltd.

Mr. Tebua Robuti

Manager of Earth Station

Original Engineering Consultant: SAPHE Project by ADB

Mr. Yasuaki Matsumoto
Mr. Yasuhisa Sakurai

Project Manager
Manager: Sewerage Section

在フィジー日本国大使館

羽田 貢由
高瀬 美和子
岡本 洋秋

一等書記官
一等書記官
館員

JICA フィジー事務所

鈴木 忠徳
向井 一朗
澤田 寛之
遠山 峰司

所長
次長
所員
所員

資料－４ 当該国の社会経済状況

国名	キリバス共和国
	Republic of Kiribati

一般指標					
政体	共和制	*1	首都	タラワ (Tarawa)	*2
元首	大統領/テプロロ・シト	*1,3	主要都市名		*3
			雇用総数	千人 (年)	*6
独立年月日	1979年7月12日	*3,4	義務教育年数	9年間 (年)	*13
主要民族/部族名	ミカロニア系 98%、ポリネシア人、欧州系	*1,3	初等教育就学率	% (年)	*6
主要言語	キリバス語、英語	*1,3	中等教育就学率	% (年)	*6
宗教	カトリックとプロテスタントが主な宗派	*1,3,3	成人非識字率	% (年)	*13
国連加盟年	1999年9月14日	*12	人口密度	人/km ² (年)	*6
世銀加盟年	1992年3月	*7	人口増加率	% (年)	*6
IMF加盟年	1995年3月	*7	平均寿命	平均 男 女	*6
国土面積	0.72 千 km ²	*6	5歳児未満死亡率	/1000 (年)	*6
総人口	86千人 (1998年)	*6	カロリー供給量	cal/日/人 (年)	*10

経済指標					
通貨単位	オーストラリア・ドル (Dollar)	*3	貿易量	(年)	
為替レート	1 US\$=1.83 (2000年12月)	*8	商品輸出	百万ドル	*15
会計年度	1月1日~12月31日	*6	商品輸入	百万ドル	*15
国家予算	(年)		輸入カバー率	(月) (年)	*14
歳入総額		*9	主要輸出品目	コプラ、なまこ、観賞用魚	*1
歳出総額		*9	主要輸入品目	食品、輸送機器、機械、工業製品	*1
総合収支	百万ドル (年)	*15	日本への輸出	百万ドル (年)	*16
ODA受取額	17.3 百万ドル (1998年)	*18	日本からの輸入	百万ドル (年)	*16
国内総生産(GDP)	百万ドル (年)	*6			
一人当たり GNP	1,170.0 ドル (1998年)	*6	粗外貨準備額	百万ドル (年)	*6
GDP産業別構成	農業 20.7% (1998年)	*6	対外債務残高	百万ドル (年)	*6
	鉱工業 % (年)	*6	対外債務返済率(DSR)	% (年)	*6
	サービス業 % (年)	*6	インフレ率	%	*6
産業別雇用	農業 男 % 女 % (年)	*6	(消費者価格物価上昇率)	(年)	
	鉱工業 % (年)	*6			
	サービス業 % (年)	*6	国家開発計画		*11
実質 GDP 成長率	% (年)	*6			

気象 (1961年~1990年平均) 観測地: タラワ (北緯1度21分、東経172度55分、標高4m)													
月	1	2	3	4	5	6	7	8	9	10	11	12	平均/計
降水量	270.0	214.8	205.1	177.5	173.0	158.9	169.2	135.8	110.8	120.0	122.4	213.2	2,070.7 mm
平均気温	27.8	27.8	27.7	27.8	28.1	27.9	27.8	27.9	28.0	28.1	27.8	27.8	27.9 °C

- *1 各国概況 (外務省)
 - *2 世界の国々一覧表 (外務省)
 - *3 世界年鑑 2000 (共同通信社)
 - *4 最新世界各国要覧 10 訂版 (東京書籍)
 - *5 理科年表 2000 (国立天文台編)
 - *6 World Development Indicators 2000
 - *7 The World Bank Public Information Center, International Financial Statistics Yearbook 1998
 - *8 Universal Currency Converter
 - *9 Government Finances Statistics Yearbook 1998 (IMF)
 - *10 Human Development Report 1999 (UNDP)
 - *11 Country Profile (EIU), 外務省資料等
 - *12 United Nations Member States
 - *13 Statistical Yearbook 1999 (UNESCO)
 - *14 Global Development Finance 1999 (WB)
 - *15 International Finances Statistics 1999 (IMF)
 - *16 世界各国経済情報ファイル 1999 (日本貿易振興会)
- 注: 商品輸入については複式簿記の形状方式を採用しているため支払い額はマイナス表記になる

国名	キリバス共和国
	Republic of Kiribati

我が国における ODA の実績 (資金協力は約束額ベース、単位：億円) *17					
項目 \ 暦年	1995	1996	1997	1998	1999
技術協力	1.09	0.98	0.51	0.93	
無償資金協力	2.15	6.56	3.34	10.85	
有償資金協力	0.00	0.00	0.00	0.00	
総 額	3.24	7.54	3.85	11.78	

当該国に対する我が国 ODA の実績 (支出純額、単位：百万ドル) *17					
項目 \ 暦年	1995	1996	1997	1998	1999
技術協力	2.59	1.68	0.97	0.88	
無償資金協力	1.57	2.85	5.73	7.66	
有償資金協力					
総 額	4.16	4.53	6.70	8.54	

OECD 諸国の経済協力実績 (支出純額、単位：百万ドル) *18					
	贈 与 (1) (無償資金協力・ 技術協力)	有償資金協力 (2)	政府開発援助 (ODA) (1)+(2)=(3)	その他政府資金 及び民間資金 (4)	経済協力総額 (3)+(4)
二国間援助 (主要供与国)	16.2	0.0	16.2	0.0	16.2
1. Japan	8.5	0.0	8.5	0.0	8.5
2. Australia	5.0	0.0	5.0	0.0	5.0
3. New Zealand	2.0	0.0	2.0	0.0	2.0
4. United States	0.6	0.0	0.6	0.0	0.6
多国間援助 (主要援助機関)	1.2	-0.1	1.1	0.0	1.1
1. IDA			0.6	0.0	0.6
2. UNDP			0.4	0.0	0.4
その他					
合 計	17.3	0.0	17.3	0.0	17.3

援助受入窓口機関 *19	
技術協力	外務省 (ただし、研修員は人事院)
無 償	外務省
協 力 隊	(外務省)

*17 我が国の政府開発援助 1999 (国際協力推進協会)

*18 International Development Statistics (CD-ROM) 2000 (OECD)

*19 JICA 資料

資料－5 討議議事録 (M/D)

**MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR UPGRADING OF ELECTRIC POWER SUPPLY
IN TARAWA ATOLL
IN THE REPUBLIC OF KIRIBATI**


In response to a request from the Government of the Republic of Kiribati (hereinafter referred to as "Kiribati"), the Government of Japan agrees to conduct a basic design study on the Project for Upgrading of Electric Power Supply in Tarawa Atoll (hereinafter referred to as "the Project") and entrust the study to the Japan International Cooperation Agency (hereinafter referred to as "JICA").

JICA agrees to send to Kiribati the basic design study team (hereinafter referred to as "the Team"), already in Kiribati, which is headed by Dr Akira Niwa, Development Specialist, Institute for International Cooperation, JICA, and is scheduled to stay in the country from November 14 to December 14, 2000.

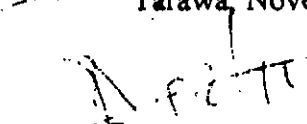
The team has held and shall continue to hold discussion with the officials concerned of the Government of Kiribati and to conduct a field survey at the study area under the Project.

In the course of discussions and field survey, both parties confirm the main items described on the Summary of Understandings and the Annexes attached hereto as the main component parts of the project. The team shall proceed to collect data and information for the preparation of the Basic Design Study Report.


Tarawa; November 22, 2000



Akira Niwa
Team Leader
Basic Design Study Team
Japan International Cooperation Agency



Francis Ngalu
Permanent Secretary
Ministry of Works and Energy



Tokia Greig
Chief Executive Officer
Public Utilities Board

SUMMARY OF UNDERSTANDINGS

1. Objective

The objective of the Project is to upgrade the present power supply system on Tarawa Atoll to a reliable and economical power supply system, that will contribute to the welfare of the people and to the improvement of economic activities.

2. Project Site

The Project sites are shown in Annex-1.

3. Responsible and Implementing Agency

The Responsible Agency is the Ministry of Works and Energy (MWE)

The Implementing Agency is the Public Utilities Board (PUB)

The organization of MWE and PUB are shown in Annexes-2 and -3, respectively.

4. Items Requested by the Government of Kiribati

After discussions with the Team, the items as shown in the Summary of Understandings and Annex-4 were requested by Kiribati. JICA will assess the appropriateness of the request and will recommend to the Government of Japan for approval.

5. Japan's Grant Aid Scheme

Kiribati understands the Japan's Grant Aid Scheme explained by the Team, as described in Annex-5.

Kiribati will take the necessary measures, as described in Annex-6, for smooth implementation of the Project, as a condition for the Japan's Grant Aid to be implemented.

6. Schedule of the Study

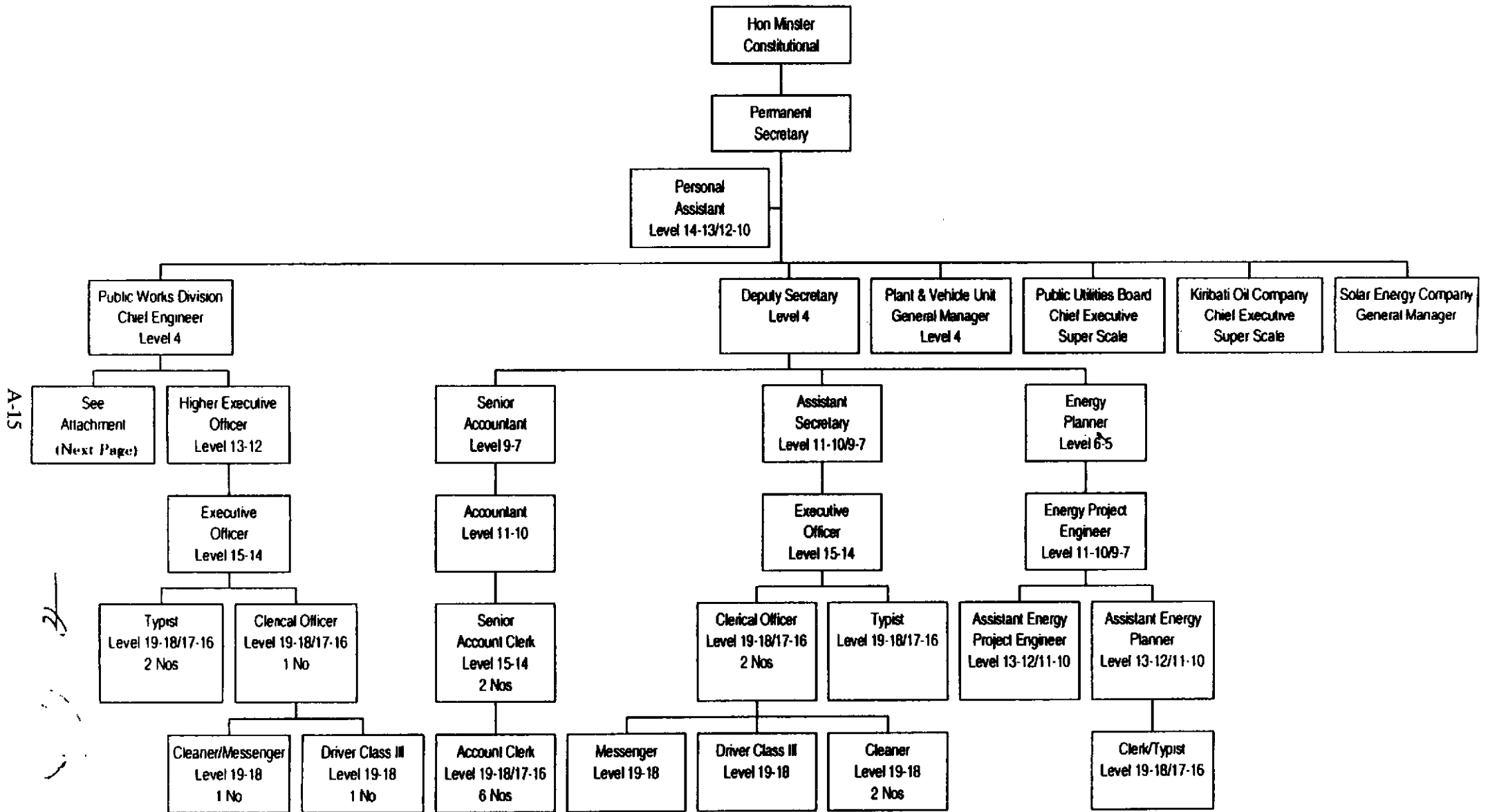
- (1) The consultants will proceed to further studies in Kiribati until December 14, 2000.
- (2) JICA will prepare a draft report in English and dispatch a team to Kiribati around the middle of February 2001 to explain the contents of the report.
- (3) Once the contents of the report are accepted by the Government of Kiribati, JICA will then prepare a final draft and submit it to the Government of Kiribati by the end of May 2001.

7. Other Relevant Issues

- (1) Kiribati confirms that it has no plan to privatize PUB.
- (2) The Kiribati side shall ensure that the land required for the new powerhouse and the laying of the 11 kV distribution facilities is available not later than the commencement date of the construction phase of the Project.

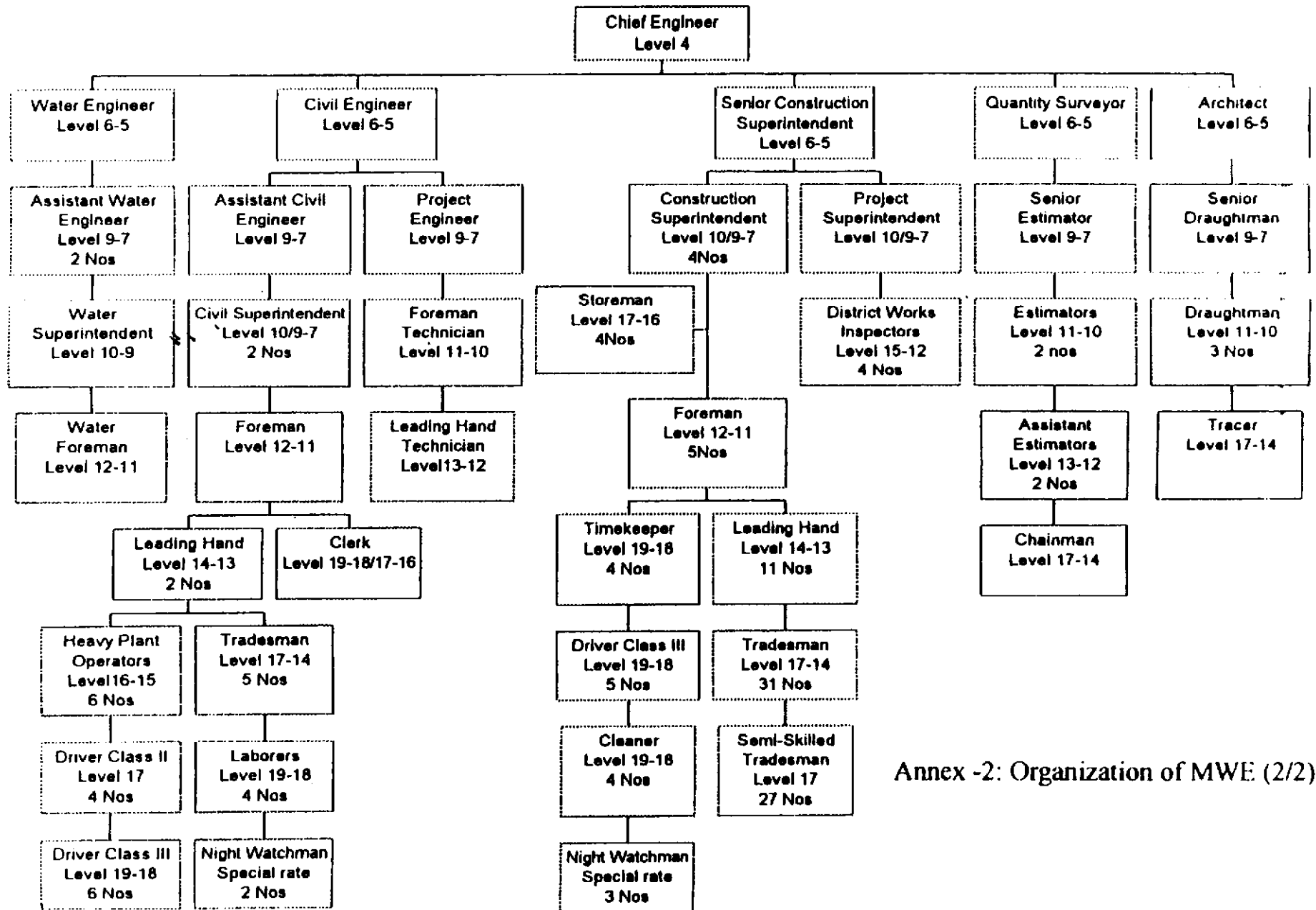
- (3) Kiribati requests that the technical skill transfer for operation and maintenance on electric power supply facility is included in the Project.
- (4) For the sake of sustainable operation and maintenance of the Project Kiribati requests that suitable factory training in the works of the equipment manufactured should form part of the Project. An application for such training must be submitted to JICA office in Fiji.
- (5) Kiribati requests that the Project includes the removal of existing 11kV distribution facilities. The team undertakes to convey such request to Government of Japan.
- (6) Kiribati undertakes to allocate the provisions in the budget for the construction of 415V distribution lines including procurement of materials such as LV cables, watt-hour meters, etc. at the Project sites in conformity with the construction schedule.
- (7) Kiribati undertakes to carry out an IEE (Initial Environment Examination) and/or EIA (Environmental Impact Assessment) before March 2001 in accordance with its laws.
- (8) PUB agrees to deal with issues relating to the Project arising from third parties including inhabitants on the Project area and individuals, commercial and industrial consumers during the implementation of the Project.
- (9) Kiribati undertakes to take necessary measures to secure the safety of Project personnel during the study and the implementation of the Project in Kiribati.
- (10) Kiribati side strongly request the Team to extend the Project to further stages as originally requested. The Team replied Kiribati side to submit the new request to the Government of Japan through appropriate diplomatic channel.

MINISTRY OF WORKS & ENERGY



PUBLIC WORKS DIVISION

Attachment

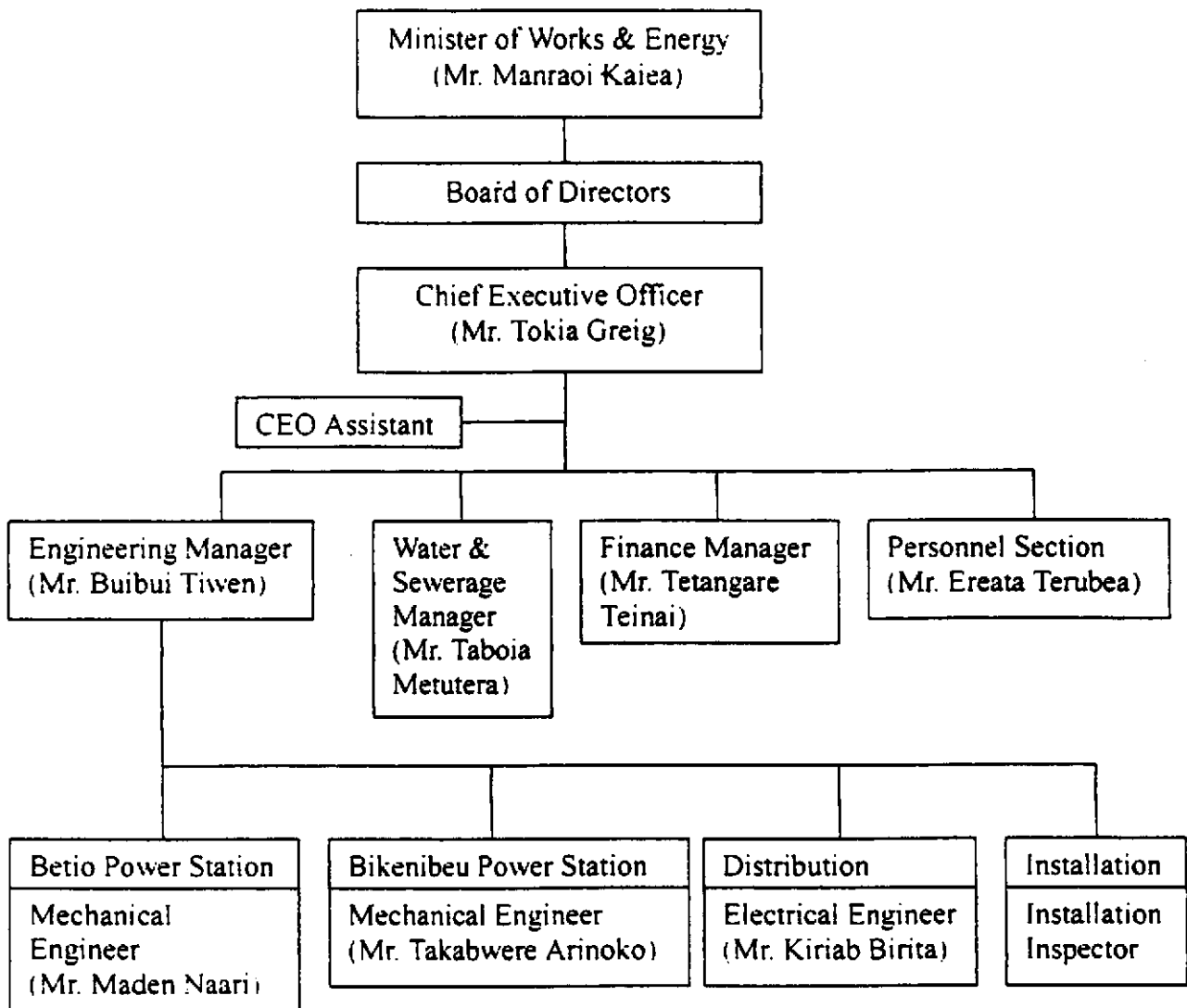


Annex -2: Organization of MWE (2/2)

A-16

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Organization of PUB



Annex-4.

Items Requested by the Government of Kiribati

- (1) Supply and installation of new diesel engine generating facilities
 - 1) Two (2) sets of diesel engine generators with output capacity approximately 1.4 MW each.
 - 2) Auxiliary mechanical system necessary for item 1) above
 - Local engine control panels for each engine.
 - Fuel and lubrication oil supply system including main fuel oil storage tank(s) and daily tank(s).
 - Oil Water separation and sludge incineration system.
 - Cooling water supply system including crossed type radiators.
 - Air supply and ventilation system.
 - Installation materials such as pipes, cables, wires, etc.
 - 3) Electrical system necessary for items 1) and 2) above and station power supply system.
 - Excitation system.
 - Remote control panel including instrumentation and protection panel(s).
 - MCC for mechanical auxiliary and station power supply system.
 - 11kV switchgears for power distribution system.
 - DC power supply system.
 - Grounding (Earthing) system.
 - Installation materials such as cables, wires, etc.
- (2) Construction of the civil and building works necessary for item (1) above at Bikenibeu power station
 - 1) Construction of a powerhouse including building services
 - 2) Construction of equipment foundations.
 - 3) Access road, rainwater drainage, oil & water separator, etc. within the site
- (3) Upgrading (Equipment supply and installation works) of 11kV power distribution lines including necessary civil works
 - 1) 11kV power distribution lines including cable termination & joint materials and other accessories
 - From Bikenibeu power station up to the existing Circuit Breaker panel (CB-4) at Teaoraereke.
 - From Bikenibeu power station up to the existing Ring Main Unit (RMU-31).
 - From the existing Ring Main Unit (RMU-43) up to the existing Ring Main Unit (RMU-44).
 - 2) Five (5) sets of 11kV Ring Main Unit with distribution transformer and accessories.
 - 3) Three (3) sets of 11 kV Circuit Breaker panels with accessories.
 - 4) One (1) set of Voltage Regulator with out put capacity approximately 3000 kVA with accessories.
- (4) Supply of spare parts and maintenance instruments & tools necessary for items (1) to (3) above.
 - 1) Spare parts and consumables for two (2) years operation
 - 2) Instruments and tools for maintenance and repair works.
 - 3) Twenty (20) sets of operation & maintenance manuals prepared by English, which are able to use for technical transfer conducted by the equipment supplier.
 - 4) Audiovisual equipment necessary for technical transfer of operation and maintenance technology

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.

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 a 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.

Major Undertakings to be taken by Each Government

No	Items	To be covered by Grant Aid	To be covered by Recipient Side
1	To be secured land		●
2	To Clear, level and reclaim the site when needed		●
3	To construct or demolish gates and fences in and around the site		●
4	To construct roads		
	1) Within the site	●	
	2) Outside the site (if necessary)		●
5	To provide facilities for water supply, drainage and other incidental facilities		
	1) Water supply		
	a. The city water distribution main to the site		●
	b. The supply system within the site (receiving and elevated tanks)	●	
	2) Drainage		
	a. The city drainage main (for storm, sewer and others) to the site		●
	b. The drainage system (for toilet sewer, ordinary waste, storm drainage and others) within the site	●	
	3) Telephone system		
	a. The telephone trunk line to the main distribution frame/panel (MDF) of the building		●
	b. The MDF and the extension after the frame/panel	●	
	4) Furniture and Equipment		
	a. General furniture		●
	b. Project Equipment	●	
6	To bear the following commissions to a bank in Japan for the banking services based upon the B/A		
	1) Advising commission of A/P		●
	2) Payment commission		●
7	To ensure unloading and customs clearance at port of disembarkation in recipient country		
	1) Marine (Air) transportation of the products from Japan to the recipient country	●	
	2) Tax exemption and custom clearance of the products at the port of disembarkation		●
	3) Internal transportation from port of disembarkation to the project site	●	
8	To accord Japanese nationals whose services may be required in connection with the supply of the products and the services under the verified contract such facilities as may be necessary for their entry into the recipient country and stay therein for the performance of their work.		●
9	To exempt Japanese nationals from customs duties, internal taxes and other fiscal levies which may be imported in the recipient country with respect to the supply of the products and services under the verified contract.		●
10	To maintain and use properly and effectively the facilities constructed and equipment provided under the Grant		●
11	To bear all the expenses, other than those to be borne by the Grant, necessary for construction of the facilities as well as for the transportation and installation of the equipment.		●

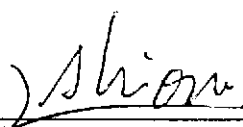
MINUTES OF DISCUSSIONS
ON THE BASIC DESIGN STUDY
ON THE PROJECT FOR UPGRADING OF ELECTRIC POWER SUPPLY
IN TARAWA ATOLL
IN THE REPUBLIC OF KIRIBATI
FOR EXPLANATION OF THE DRAFT REPORT

In November 2000, the Japan International Cooperation Agency (hereinafter referred to as "JICA") dispatched a Basic Design Study Team on the Project for Upgrading of Electric Power Supply in Tarawa Atoll (hereinafter referred to as "the Project") to the Republic of Kiribati (herein after referred to as "Kiribati"), and through discussions, field survey and technical examination of the results in Japan, JICA prepared a draft report of the study.

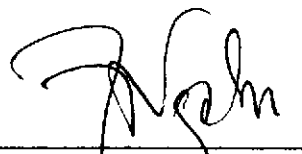
In order to explain and to consult the Government of Kiribati on the components of the draft report, JICA sent to Kiribati the Draft Report Explanation Team (hereinafter referred to as "the Team"), which is headed by Mr. Hiroshi Shiono, Deputy Director, First Programme Division, Tsukuba International Centre, JICA, from February 23 to March 8, 2001.

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


Dated February 26th 2001 at Betio, Tarawa, Kiribati.



Mr. Hiroshi Shiono
Team Leader
Draft Report Explanation Team
Japan International Cooperation Agency



Mr. Francis Ngahu
Permanent Secretary
Ministry of Works and Energy
Republic of Kiribati



Mr. Tokia Greig
Chief Executive Officer
Public Utilities Board (PUB)

SUMMARY OF UNDERSTANDING

1. Components of the Draft Report

The Kiribati side agreed and accepted in principle the components of the draft report explained by the Team.

2. Japan's Grant Aid Scheme

The Kiribati side has understood the Japan's Grant Aid Scheme and the necessary measures to be taken by the Government of Kiribati as explained by the Team, which is described in Annex – 5 and Annex – 6 of the Minutes of Discussions signed by both parties on November 22, 2000.

3. Schedule of the Study

JICA will complete the final report in accordance with the confirmed item and send it to the Government of Kiribati by the end of May, 2001.

4. Other relevant issues

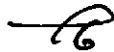
- (1) The Kiribati side gives assurance that land is available for the 11 kv distribution cables, ring main units, circuit breaker panels, distribution transformers, etc., supplied and installed under the Project for the construction phase of the Project not later than the date of the Exchange of Notes between the Government of Japan and the Government of Kiribati.
- (2) The Team explains to the Kiribati side that the technical transfer for the operation and maintenance of the equipment under the Project during the installation, testing and adjustment period is already included as a component part of the Project in the Basic Design Report.
- (3) Regarding the training for the operation and maintenance of the equipment at the manufacturer's factory, an application by the Kiribati side must be submitted to JICA office Fiji.
- (4) The Kiribati Government undertakes to source funding for the construction of the 415V distribution lines for the waiting consumers in conformity with the Project construction schedule.
- (5) It is confirmed that the application form of the Environment Impact Statement (EIS) is now being prepared by PUB for submission for approval by the Ministry of Environment and Social Development (MESD), and that confirmation of approval will be obtained by the end of March 2001.
- (6) The Kiribati side agrees to deal with issues relating to the Project arising from third parties in Kiribati including inhabitants on the Project area and individuals, commercial and industrial consumers during the implementation of the Project.

H. S



- (7) The Kiribati side undertakes to take necessary measures to secure the safety of the Project personnel during the study and implementation of the Project in Kiribati.
- (8) The Team handed one copy of the draft detailed specification of the equipment to the Chief Executive Officer, PUB. Both sides agreed that this draft specification are protected under the copy right law and are confidential for the purpose of the tendering process and should not be duplicated or released to any third party.

H.S



資料－6 事前評価表

事前評価表(無償資金協力)

1. 対象事業名	キリバス共和国 タラワ環礁電力供給施設整備計画
2. 我が国が援助することの必要性・妥当性	<p>(1) 「キ」国は、広大な 200 海里水域を有しており、我が国のかつお、まぐろ漁業にとり重要な漁場になっている。また、1976 年から宇宙開発事業団(NASDA)の衛星追跡センター(ダウンレンジ局)を「キ」国のクリスマス島に設置していること等、我が国と密接な関係を有している。</p> <p>(2) 「キ」国の国家開発戦略(2000~2003)の中で経済活性化のための社会基盤整備を掲げ、その内、電力セクターの開発戦略として安定した電力供給の確保および老朽化した発電設備の改修を掲げている。</p> <p>(3) 当該国の社会・経済事情については資料-4の「当該国の社会経済状況」参照</p>
3. 協力対象事業の目的(プロジェクト目標)	<p>本計画は、「キ」国政府が国家開発戦略において、主要目標としている「キ」国の経済成長と国民生活の改善促進を達成するため、首都タラワへの信頼性が高く、安定した電力供給および計画目標年次までの電力需要の増加に対応できる発電能力を確保するため、発電施設の建設、配電網の整備並びに未電化地域の電化を促進することを目的とするものである。</p>
4. 協力対象事業の内容	<p>(1) 対象地域 南タラワおよび北タラワのナベイナまでの地域</p> <p>(2) アウトプット タラワ島の発電所及び配電網が整備される。</p> <p>(3) インプット</p> <ol style="list-style-type: none"> 1) 発電建屋の建設、発電設備(1,400 kW x 2台)の調達・据付、予備品・工具の調達 2) 11 kV 配電線路の改修、 <ol style="list-style-type: none"> a) 総線路長 約 16.4 km b) 電圧調整器(1式)及び遮断器盤(2面)の調達・据付、予備品・工具の調達 3) 11 kV 配電線路の新設 <ol style="list-style-type: none"> a) 総線路長 約 4.9 km b) 配電用変電所 5箇所の調達・据付、予備品・工具の調達

(4) 総事業費 概算事業費 12.88 億円（日本側 12.30 億円、「キ」国側 0.58 億円）

(5) スケジュール

21 ヶ月の工期を予定（実施設計：約 4.0 ヶ月、機材調達および据付：約 17 ヶ月）

(6) 実施体制

1) 先方責任機関： 公共事業エネルギー省（MWE）

2) 先方実施機関： 公共事業公社（PUB）：先方負担事項の実施と完成後の運転・維持管理を行う。

5. プロジェクトの成果

(1) プロジェクトにて裨益をうける対象の範囲及び規模

南タラワのベシオから北タラワのナベイナ地区間の住民約 38,000 人

(2) 事業の目的（プロジェクトの目標）を示す成果指標

現状の発電能力が 2.8 MW 増加し、安定した電力供給が確保できる。

(3) その他の成果指標

1) 電化率の向上

現状の電化率が向上する。

2) 発電効率の向上

現状の発電効率が向上する。

3) 電力損失の低減

現状の電力損失が低減する。

4) 待機需要家数の減少

現状の待機需要家が減少する。

6. 外部要因リスク

(1) 「キ」国側負担工事である 415-240 V 低圧配電線路用資機材調達

(2) 年間の設備利用率を 60 %以上とするような、運用計画を立案する必要がある。

7. 今後の評価計画

(1) 事後評価に用いる成果指標

- 1) 電化率
- 2) 発電効率
- 3) 電力損失
- 4) 待機需要家数

(2) 評価のタイミング

- 1) 事業終了時の全体の事後評価
- 2) 事業終了後、一年後の事後評価

資料－7 参考資料／入手資料リスト

収集資料リスト

調査名 キリバス共和国タラワ環礁電力供給施設整備計画基本設計調査

番号	名 称	形態 図書・ビデオ 地図・写真等	デジタル・コピー	発 行 機 関	発行年
1	National Development Strategies 2000 - 2003	図書	コピー	Ministry of Works and Energy	2000年
2	National Development Strategy, 1996 to 1999	図書	コピー	Government of the Republic of Kiribati	1996年
3	Medium Term Strategy An Action Programme for the National Development Strategy through to the year 2000	図書	コピー	Ministry of Finance & Economic Planning (MFEP)	1997年
4	2001 Development Budget	図書	コピー	Ministry of Finance & Economic Planning (MFEP)	2000年
5	Annual Review and Update of the Medium Term Strategy: 1998	図書	コピー	MFEP	1999年
6	Report on the 1995 Census of Population	図書	コピー	MFEP	1997年
7	Public Utilities Board: Ordinance Cap. 83 (With Amendment No. 4 and 12 of 1999)	図書	コピー	Government of Kiribati	1996年
8	Appendix 1: Terms of Reference for Design (AusAID)	図書	コピー	PUB	2000年
9	Environment Act 1999	図書	コピー	Ministry of Environment and Social Development (MESD)	2000年
10	Environment Protection: Regulations 2000 (Initial Draft)	図書	コピー	MESD	2000年
11	The Republic of Kiribati (No. 9 of 1999)	図書	コピー	MESD	2000年
12	The South Pacific Sea Level & Climate Monitoring Project. Monthly Data Report No. 60	図書	コピー	AusAID	2000年

資料－8 電力需給バランス

Power Balance

Description	Installed Capacity [kW]	Recorded						Forecast												Remarks		
		1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012			
1. PEAK DEMAND							*4															
1.1. Existing Consumer		1,586	1,850	1,857	2,060	2,200	2,695	2,860	3,260	3,690	4,350	4,610	4,890	5,180	5,490	5,820	6,170	6,540	6,930	*1		
1.2. Waiting Consumer																						
1) Private Consumer									90	130												
2) Public Consumer								217	133	285												
(Total)		1,586	1,850	1,857	2,060	2,200	2,695	3,077	3,483	4,105	4,350	4,610	4,890	5,180	5,490	5,820	6,170	6,540	6,930			
2. GENERATING OUTPUT																						
2.1 Betio Power Station (*5)																						
No.1 (1953)	300	265	265	(Dismantled)																		
No.3 (1953)	300	265	265	265	(Retire)																	
No.6 (1976)	750	750	700	700	700	700	650	650	650	650	650	650	(Retire)							PO *2		
No.7 (1976)	750		700	700	700	700	650	650	650	650	650	650	(Retire)							PO *2		
No.8 (1988)	1,080		350	350	350	850	850	850	850	850	800	800	800	800	800	800	800	800	800			
No.9 ()																1,000	1,000	1,000	1,000			
No.10 ()																	1,000	1,000	1,000			
(Subtotal of Available Capacity)		1,280	2,280	2,015	1,750	2,250	2,150	2,150	2,150	2,150	2,100	1,450	800	800	800	1,800	2,800	2,800	2,800			
2.2 Bikenibeu Power Station (*5)																						
No. 1 (1969)	600	500	500	500	500	500	500	500	500	480	480	480	480	480	(Retire)						PO *2	
No. 2 (1969)	600	500	500	500	500	500	500	500	500	480	480	480	480	480	480	(Retire)						PO *2
No. 3 ()	1,400									1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	This Project	
No. 4 ()	1,400									1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	This Project	
No. 5 ()	1,400											1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400		
No. 6 ()	1,400											1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400		
(Subtotal of Available Capacity)		1,000	1,000	1,000	1,000	1,000	1,000	1,000	1,000	3,760	3,760	5,160	6,560	6,560	6,080	5,600	5,600	5,600	5,600	5,600		
2.3 TOTAL AVAILABLE CAPACITY [kW]		2,280	3,280	3,015	2,750	3,250	3,150	3,150	3,150	5,910	5,860	6,610	7,360	7,360	6,880	7,400	8,400	8,400	8,400			
3. POWER BALANCE (2.3 - 1.) [kW]		694	1,430	1,158	690	1,050	455	73	-333	1,805	1,510	2,000	2,470	2,180	1,390	1,580	2,230	1,860	1,470			
4. MAXIMUM UNIT CAPACITY [kW]		750	700	700	700	850	850	850	850	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	1,400	*3		
5. STABD-BY CAPACITY (3. - 4.) [kW]		-56	730	458	-10	200	-395	-777	-1,183	405	110	600	1,070	780	-10	180	830	460	70			

Note: PO means Peak Operation.

Remarks: *1: Average of Annual Increasing Ratio for FORECAST is 6.0 %.

*2: Retired date was supposed considering availability of the spare parts, major troubles and thermal efficiency.

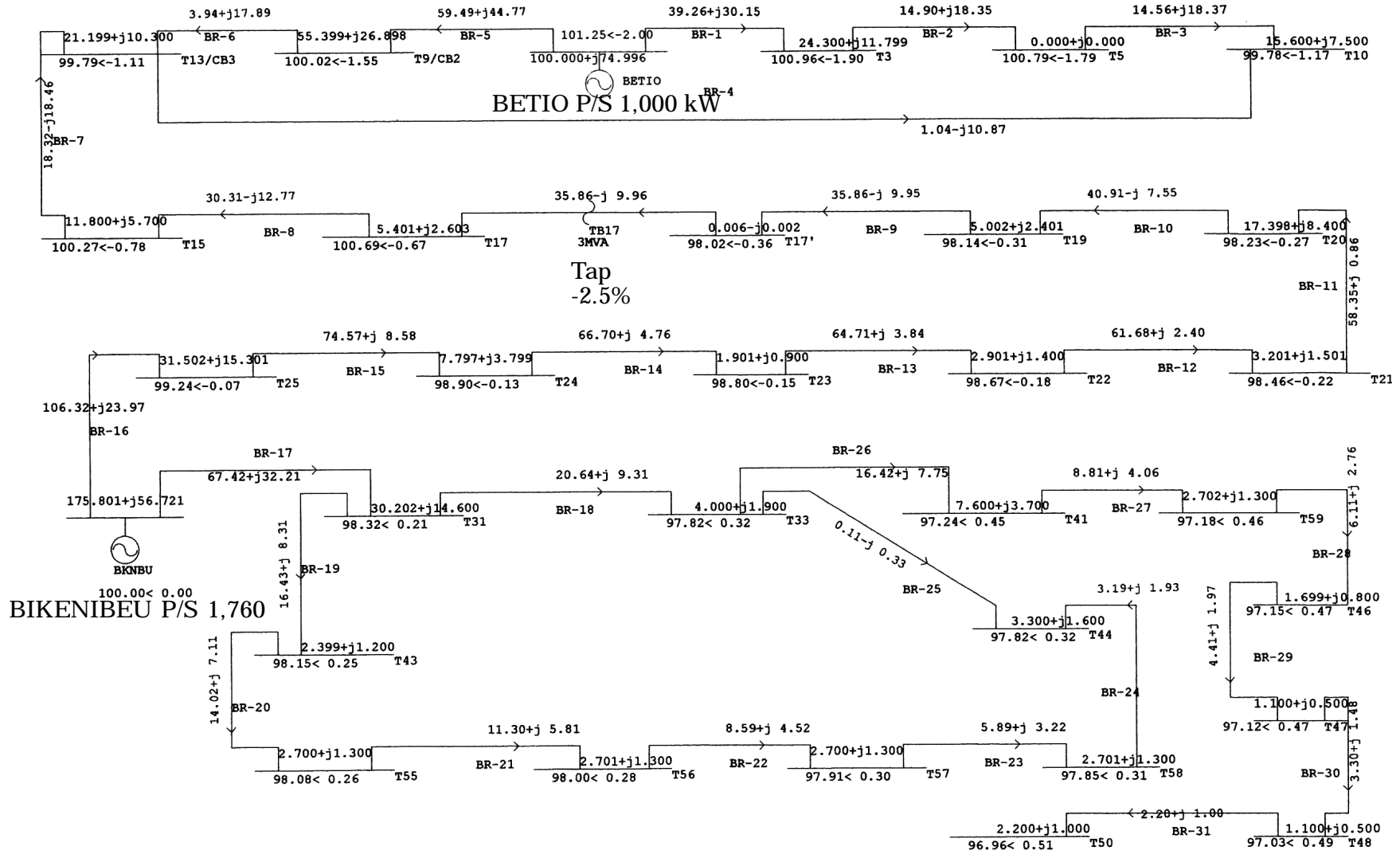
*3: This value means available capacity of the Maximum Unit..

*4: This data is as of 31 December 2000. (Betio P/S=1,795 kW and Bikenibeu P/S=900 kW at day time)

*5: Numerical value in parenthesis means manufacturing year of Diesel Engine.

資料－9 電力潮流の検討

Study Result of Power Flow



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- Remarks:
1. Total Distribution losses on 11kV line is 53 kW
 2. Load Condition is based on the actual measurement on October 2000 by PUB.