

A. Data Handbook

Data for the Tarawa Atoll's power system in the Republic of Kiribati are provided in this handbook for generation and distribution. There is no transmission system on Tarawa Atoll. Data that was missing or assumed are noted accordingly with a red highlight.

A.1 Generation

Generating Unit Data on the Tarawa Atoll electric system in the Republic of Kiribati are given in Table 1.

Table 1. Tarawa Atoll Generator Data

Bus No.	Generator Name	Base Voltage (kV)	Base kVA	PMax (kW)	PMin (kW)	Manufacturer	Year In-service	Status**
1	BIKENIBEU NO.1	0.415	750	600	0	Daihatsu	Unknown	0
1	BIKENIBEU NO.2	0.415	750	600	0	Daihatsu	Unknown	0
2	BIKENIBEU NO.3	11	1,750	1,400	0	Daihatsu	2002	1
2	BIKENIBEU NO.4	11	1,750	1,400	0	Daihatsu	2002	1
2	BIKENIBEU NO.5	11	1,750	1,400	0	Daihatsu	2005	1
3	BETIO NO.6	11	937.5	750	0	Unknown	Unknown	0
3	BETIO NO.7	11	937.5	750	0	Unknown	Unknown	0
3	BETIO NO.8	11	1,250	1,000	0	Daihatsu	2003	1

Note: All values given are nameplate values.

A.2 Power Transformers

Power Transformer Data on the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 2.

Table 2. Power Transformers

No.	From Bus	Bus No.	To Bus	kVA	Nominal Voltage (kV)		Impedance p.u.*		In Service Date	Status**
					Primary	Secondary	Resistance	Reactance		
T-1	BUS-2	BUS-2	STATION SERVICE	300	11	0.415	0.0026	0.0399	Unknown	1
T-2	RMU-2	2	POWER HOUSE	200	11	0.415	0.0042	0.0401	2003	1
T-51	RMU-51	51	POWER HOUSE	1250	11	0.415	0.0009	0.0400	Unknown	0

Notes: * p.u. impedance based on the transformer base MVA

** Status of transformer: 1= On-line, 0=Off-line

A.3 Distribution System

Distribution system equipment data for Tarawa Atoll in the Republic of Kiribati are listed in this section, including data for distribution feeders, distribution transformers, and secondary wires.

Distribution Feeder Data for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Tables 3 and 4.

Table 3. Distribution Feeder Totals

Feeder	Substation	Total feeder Length (m)	Connected kVA
F-BW	BETIO WEST	9,611	1,950
F-BE	BETIO EAST	8,471	1,200
F-1	BIKENIBEU	23,977	2,500
F-2	BIKENIBEU	15,536	2,350
Tarawa Atoll TOTALS		57,595	8,000

Data for the 11 kV Distribution Feeders for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 4.

Table 4. 11 kV Distribution Feeder Data

Record No.	From	Bus No.	To	Bus No.	Conductor Type	Config. Type	Length (meters)
F2-2	BUS-2	2	RMU-29	29	95 mm ² CU XLPE	PVC CONDUIT	430
F2-3	RMU-29	29	RMU-28	28	95 mm ² CU XLPE	PVC CONDUIT	580
F2-4	RMU-28	28	RMU-27	27	95 mm ² CU XLPE	PVC CONDUIT	400
F2-5	RMU-27	27	RMU-26	26	95 mm ² CU XLPE	PVC CONDUIT	850
F2-6	RMU-26	26	RMU-25	25	95 mm ² CU XLPE	PVC CONDUIT	710
F2-7	RMU-25	25	RMU-24	24	95 mm ² CU XLPE	PVC CONDUIT	100
F2-8	RMU-24	24	RMU-23	23	95 mm ² CU XLPE	PVC CONDUIT	700
F2-9	RMU-23	23	RMU-22	22	95 mm ² CU XLPE	PVC CONDUIT	990
F2-10	RMU-22	22	RMU-21	21	95 mm ² CU XLPE	PVC CONDUIT	1,600
F2-11	RMU-21	21	RMU-54	54	95 mm ² CU XLPE	PVC CONDUIT	1,780
F2-12	RMU-54	54	RMU-20	20	95 mm ² CU XLPE	PVC CONDUIT	7
F2-13	RMU-20	20	RMU-19	19	95 mm ² CU XLPE	PVC CONDUIT	1,250
F2-14	RMU-19	19	RMU-60	60	95 mm ² CU XLPE	PVC CONDUIT	850
F2-15	RMU-60	60	RMU-17	17	95 mm ² CU XLPE	PVC CONDUIT	900
F2-16	RMU-17	17	RMU-16	16	25 mm ² CU XLPE	PVC CONDUIT	834
F1-17	BUS-2	2	RMU-30	30	50 mm ² CU XLPE	PVC CONDUIT	750
F1-18	RMU-30	30	RMU-40	40	50 mm ² CU XLPE	PVC CONDUIT	830
F1-19	RMU-40	40	RMU-42	42	50 mm ² CU XLPE	PVC CONDUIT	740
F1-20	RMU-42	42	RMU-31	31	50 mm ² CU XLPE	PVC CONDUIT	795
F1-21	RMU-31	31	RMU-32	32	25 mm ² CU XLPE	PVC CONDUIT	1,486
F1-22	RMU-32	32	RMU-33_A	33_A	25 mm ² CU XLPE	PVC CONDUIT	879

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Record No.	From	Bus No.	To	Bus No.	Conductor Type	Config. Type	Length (meters)
F1-23	RMU-33_A	33_A	RMU-43	43	25 mm ² CU XLPE	PVC CONDUIT	1,184
F1-24	RMU-43	43	RMU-55	55	25 mm ² CU XLPE	PVC CONDUIT	1,210
F1-25	RMU-55	55	RMU-56	56	25 mm ² CU XLPE	PVC CONDUIT	610
F1-26	RMU-56	56	RMU-57	57	25 mm ² CU XLPE	PVC CONDUIT	850
F1-27	RMU-57	57	RMU-58	58	25 mm ² CU XLPE	PVC CONDUIT	270
F1-28	RMU-58	58	RMU-44	44	25 mm ² CU XLPE	PVC CONDUIT	1,170
F1-29	RMU-44	44	RMU-39	39	25 mm ² CU XLPE	PVC CONDUIT	834
F1-30	RMU-39	39	RMU-33_B	33_B	25 mm ² CU XLPE	PVC CONDUIT	536
F1-31	RMU-33_B	33_B	RMU-38	38	25 mm ² CU XLPE	PVC CONDUIT	606
F1-32	RMU-38	3	RMU-52	52	25 mm ² CU XLPE	PVC CONDUIT	896
F1-33	RMU-52	52	RMU-34	34	25 mm ² CU XLPE	PVC CONDUIT	561
F1-34	RMU-34	34	RMU-45	45	25 mm ² CU XLPE	PVC CONDUIT	309
F1-35	RMU-45	45	RMU-41	41	25 mm ² CU XLPE	PVC CONDUIT	1,059
F1-36	RMU-41	41	RMU-59	59	25 mm ² CU XLPE	PVC CONDUIT	765
F1-37	RMU-59	59	RMU-46	46	25 mm ² CU XLPE	PVC CONDUIT	667
F1-38	RMU-46	46	RMU-47	47	25 mm ² CU XLPE	PVC CONDUIT	555
F1-39	RMU-47	47	RMU-48	48	25 mm ² CU XLPE	PVC CONDUIT	3,381
F1-40	RMU-48	48	RMU-49	49	25 mm ² CU XLPE	PVC CONDUIT	2,310
F1-41	RMU-49	49	RMU-50	50	25 mm ² CU XLPE	PVC CONDUIT	724
					BIKENIBEU F-1	TOTAL	23,977
F2-42	RMU-16	16	RMU-15	15	25 mm ² CU XLPE	PVC CONDUIT	617
F2-43	RMU-15	15	RMU-14	14	25 mm ² CU XLPE	PVC CONDUIT	1,708
F2-44	RMU-14	14	RMU-13_B	13_B	25 mm ² CU XLPE	PVC CONDUIT	1,230
					BIKENIBEU F-2	TOTAL	15,536

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Record No.	From	Bus No.	To	Bus No.	Conductor Type	Config. Type	Length (meters)
BW-45	RMU-13_A	13_A	RMU-12	12	25 mm ² CU XLPE	PVC CONDUIT	585
BW-46	RMU-12	12	RMU-11	11	25 mm ² CU XLPE	PVC CONDUIT	216
BW-47	RMU-11	11	RMU-10	10	25 mm ² CU XLPE	PVC CONDUIT	270
BW-48	RMU-10	10	CB-1	CB-1	25 mm ² CU XLPE	PVC CONDUIT	3,700
BW-49	CB-1	CB-1	RMU-5	5	25 mm ² CU XLPE	PVC CONDUIT	2,800
BW-50	RMU-5	5	RMU-4	4	25 mm ² CU XLPE	PVC CONDUIT	446
BW-51	RMU-4	4	RMU-3	3	25 mm ² CU XLPE	PVC CONDUIT	654
BW-52	RMU-3	3	RMU-37	37	25 mm ² CU XLPE	PVC CONDUIT	628
BW-53	RMU-37	37	RMU-36	36	25 mm ² CU XLPE	PVC CONDUIT	208
BW-54	RMU-36	36	RMU-2	2	25 mm ² CU XLPE	PVC CONDUIT	104
BW-55	RMU-2	2	BETIO PS	BUS-3	25 mm ² CU XLPE	PVC CONDUIT	50
					BETIO WEST	TOTAL	9,661
BE-56	RMU-13_B	13_B	RMU-18	18	25 mm ² CU XLPE	PVC CONDUIT	284
BE-57	RMU-18	18	CB-2	CB-2	25 mm ² CU XLPE	PVC CONDUIT	4,310
BE-58	CB-2	CB-2	RMU-9	9	25 mm ² CU XLPE	PVC CONDUIT	375
BE-59	RMU-9	9	RMU-8	8	25 mm ² CU XLPE	PVC CONDUIT	670
BE-60	RMU-8	8	RMU-7	7	25 mm ² CU XLPE	PVC CONDUIT	741
BE-61	RMU-7	7	RMU-35	35	25 mm ² CU XLPE	PVC CONDUIT	1,040
BE-62	RMU-35	35	RMU-53	53	25 mm ² CU XLPE	PVC CONDUIT	100
BE-63	RMU-53	53	RMU-6	6	25 mm ² CU XLPE	PVC CONDUIT	760
BE-64	RMU-6	6	BETIO PS		25 mm ² CU XLPE	PVC CONDUIT	191
					BETIO EAST	TOTAL	8,471
					Tarawa Atoll TOTALS		57,645

Underground Distribution Cable Data for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 5. These are the values that EasyPower used in the conductor impedance calculations.

Table 5. Underground Distribution Feeder Cable Data

Cable Size	Cable Type	Burial Method	AC Resistance	Inductive Reactance	Line Charging	Capacity (amperes)
16 mm ² Cu	PILC	PVC	0.985969	0.142352	0.019073	102
25 mm ² Cu	XLPE	PVC	0.812697	0.136006	0.016876	135
50 mm ² Cu	XLPE	PVC	0.432619	0.121066	0.013592	207
95 mm ² Cu	XLPE	PVC	0.215751	0.109297	0.011005	328

Note: All resistance, reactance, and Line charging values are in ohms/km.

Distribution Voltage Regulator Data for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 6.

Table 6. Distribution Voltage Regulator Data

No.	Location	Rating (kVA)	Nominal Voltage (kV)		Impedance p.u.*		In-Service Date	Manufacturer
			Primary	Secondary	Resistance	Reactance		
VR-1	Between RMU-17 and RMU-60	3000	11	11	0.0006	0.0920	2002	Aichi Electric

Note: All resistance and reactance values are in per unit on kVA base rating.

Distribution Circuit Breaker Data for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 7.

Table 7. Distribution Circuit Breaker Data

Record No.	Location	Voltage Rating	Continuous Rating	Interrupting Rating	Manufacturer	Year of Installation
CB-1	Between RMU-5 and RMU-10	15 kV	640	0.142352	Unknown	Unknown
CB-2	At Causeway Cable, Between RMU-9 and RMU-18	15 kV	640	0.136006	Unknown	Unknown
CB-3	Between RMU-13B and RMU-14	15 kV	640	0.121066	Unknown	Unknown
CB-4	At voltage Regulator, Between RMU-17 and RMU-60	15 kV	640	0.109297	Unknown	Unknown
CB-5	Between RMU-24 and RMU-25	15 kV	640	0.109297	Unknown	Unknown
CB-6	Between RMU-33B and RMU-38	15 kV	640	0.109297	Unknown	Unknown
CB-7	Between RMU-31 and RMU-42	15 kV	640	0.109297	Unknown	Unknown

Note:

Distribution Transformer Data for the Tarawa Atoll electric system in the Republic of Kiribati is provided in Table 8. All transformers on Tarawa Atoll are 3-phase.

Table 8. Three-phase Distribution Transformers

NO.	LOCATION	FEEDER	kVA	BUS NO.	kV	Total
DT-03	LAGOON WEST	BW	200	RMU-3	11	200
DT-04	TRANSMITTER	BW	100	RMU-4	11	100
DT-05	OCEAN WEST	BW	100	RMU-5	11	100
DT-06A	BKL	BE	200	RMU-6	11	200
DT-06B	BLK	BE	300	RMU-6	11	300
DT-07	LAGOON WEST	BE	100	RMU-7	11	100
DT-08	POLICE HQ	BE	200	RMU-8	11	200
DT-09	BETIO CLUB	BE	100	RMU-9	11	100
DT-10	BAIRIKI	BW	100	RMU-10	11	100
DT-11	STADIUM	BW	300	RMU-11	11	300
DT-12	PWD CONSTRUCTION	BW	100	RMU-12	11	100
DT-13	BAIRIKI EAST	BW	200	RMU-13A	11	200
DT-14	NANIKAI	F-2	100	RMU-14	11	100
DT-15	TEAORAEREKE	F-2	100	RMU-15	11	100
DT-16	USP CENTRE	F-2	100	RMU-16	11	100
DT-17	WATER GALLERY	F-2	200	RMU-17	11	200
DT-18	ASSEMBLY HOUSE	BE	200	RMU-18	11	200
DT-19	BANRAEABA	F-2	100	RMU-19	11	100
DT-20	AMBO	F-2	100	RMU-20	11	100
DT-21	TABORIO	F-2	100	RMU-21	11	100

DT-22	TANGINTEBU	F-2	100	RMU-22	11	100
DT-23	EITA	F-2	50	RMU-23	11	50
DT-24	CHURCH OF GOD	F-2	100	RMU-24	11	100
DT-25	BANGANTEBURE	F-2	100	RMU-25	11	100
DT-26	BIKENIBEU WEST	F-2	100	RMU-26	11	100
DT-27	KHC	F-2	200	RMU-27	11	200
DT-28	FTC	F-2	100	RMU-28	11	100
DT-29	BIK POLICE	F-2	200	RMU-29	11	200
DT-30	EBS	F-1	100	RMU-30	11	100
DT-31	CRAY FISH	F-1	100	RMU-31	11	100
DT-32	FISH FARM	F-1	100	RMU-32	11	100
DT-33	BONRIKI AIRPORT	F-1	200	RMU-33A	11	200
DT-34	TANAEA	F-1	100	RMU-34	11	100
DT-36	ABAMAKORO	BW	100	RMU-36	11	100
DT-37	ABAMAKORO LTD	BW	750	RMU-37	11	750
DT-38	BONRIKI VILLAGE	F-1	50	RMU-38	11	50
DT-39	BONRIKI PUMP STA	F-1	50	RMU-39	11	50
DT-40	TABONGA	F-1	100	RMU-40	11	100
DT-41	BUOTA PUMP	F-1	50	RMU-41	11	50
DT-42	NAWEREWERE	F-1	300	RMU-42	11	300
DT-43	KPC	F-1	100	RMU-43	11	100
DT-44	CONTROL TOWER	F-1	100	RMU-44	11	100
DT-45	BUOTA VILLAGE	F-1	100	RMU-45	11	100
DT-46	BUOTA NORTH	F-1	100	RMU-46	11	100
DT-47	ABATAO	F-1	100	RMU-47	11	100

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DT-48	TABITEUEA	F-1	100	RMU-48	11	100
DT-49	TAPIANG	F-1	100	RMU-49	11	100
DT-50	NABEINA	F-1	100	RMU-50	11	100
DT-52	ANRAE	F-1	50	RMU-52	11	50
DT-53	KPA	BE	100	RMU-53	11	100
DT-54	NEW PARLIAMENT	F-2	500	RMU-54	11	500
DT-55	UNKNOWN	F-1	100	RMU-55	11	100
DT-56	UNKNOWN	F-1	100	RMU-56	11	100
DT-57	UNKNOWN	F-1	100	RMU-57	11	100
DT-58	UNKNOWN	F-1	100	RMU-58	11	100
DT-59	UNKNOWN	F-1	100	RMU-59	11	100
DT-60	ANTEBUKA	F-2	100	RMU-60	11	100
					TOTAL	8000