

A. Data Handbook

Data for Tuvalu Electricity Corporation (TEC)'s power system on Funafuti Atoll are provided in this handbook for generation and distribution. Data that were missing or assumed are noted accordingly with a red highlight.

A.1 Generation

Generator data for the Tuvalu Electricity Corporation (TEC) power system on Funafuti Atoll is given in the table below.

Table 1. TEC – Funafuti Atoll Generator Data

Station Name	Unit Designation	Base Voltage (kV)	Base KVA	PMax (KW)	Speed (rpm)	Type	Xd	X''d	Xo	Unit Status*
OLD FOGAFALE	GEN-1	0.415	1,250	1,000	Unknown	MS Diesel	1.96	0.12	0.02	0
OLD FOGAFALE	GEN-2	0.415	180	144	Unknown	MS Diesel	1.96	0.12	0.02	0
OLD FOGAFALE	GEN-3	0.415	310	248	Unknown	MS Diesel	1.96	0.12	0.02	0
OLD FOGAFALE	GEN-4	11	500	400	Unknown	MS Diesel	1.9	0.215	0.025	1
OLD FOGAFALE	GEN-5	11	500	400	Unknown	MS Diesel	2.0	0.16	0.025	1
NEW FOGAFALE	GEN-6	11	640	570	750	MS Diesel	1.74	0.181	0.104	1
NEW FOGAFALE	GEN-7	11	640	570	750	MS Diesel	1.69	0.186	0.107	1
NEW FOGAFALE	GEN-8	11	640	570	750	MS Diesel	1.69	0.21	0.107	1
STADIUM	SOLAR-1	11	40	40	N/A	PV Solar	N/A	N/A	N/A	1
Total Fogafale Generation Available			2,960	2,550						

Notes:

* Unit Status: 0 = unavailable for service, 1 = available for service.

Table 2. Power Transformers

Tr. No.	From Bus	To Bus	Location	Base KVA	Voltage (kV)		Impedance p.u.*		In-Service Year	Status**
					Primary	Secondary	Resistance	Reactance		
1	Old Fogafale	RMU South	Generator Step-up	750	0.415	11	0.006	0.0425	UNKNOWN	1
2	Old Fogafale	RMU North	Generator Step-up	750	0.415	11	0.006	0.0425	UNKNOWN	1
			TOTAL	1,500						

Notes:

* The per unit impedance is based on the transformer base kVA

** Status of transformer: 1= On-line, 2=Off-line

A.2 Distribution System Data

Data for the Tuvalu Electricity Corporation (TEC) distribution system on Funafuti Atoll is given in the pages that follow. Distribution system equipment data listed in this section includes data for distribution feeders and distribution transformers.

Table 3. Distribution Feeder Summary

Feeder	Substation Name	Total feeder Length (meters)	Connected KVA
F-1	NEW FOGAFALE	2,850	260
F-2	NEW FOGAFALE	10,780	1,870
F-ES	NEW FOGAFALE	1,040	700
	TOTALS	14,670	2,830

Table 4.

Table 4. Distribution Feeder Data

Record No.	From	To	Conductor Type	Type	Length (meters)
1	RMU NORTH	RMU SOUTH	25 mm ² XLPE CU	PVC CONDUIT	10
2	RMU SOUTH	RISER-3	25 mm ² XLPE CU	PVC CONDUIT	100
3	RISER-3	NEW FOGAFALE	100 mm ² AAC OH	PVC CONDUIT	100
FEEDER-1					
4	NEW FOGAFALE	RISER-4	100 mm ² AAC OH	PVC CONDUIT	100
5	RISER-4	RMU-1	50 mm ² XLPE CU	PVC CONDUIT	1,150
6	RMU-1	RMU-1A	25 mm ² XLPE AL	PVC CONDUIT	1,600
FEEDER-1 TOTALS					2,850
FEEDER-2					
7	NEW FOGAFALE	RISER-1	100 mm ² AAC OH	PVC CONDUIT	100
8	RISER-1	RMU-9	50 mm ² XLPE CU	PVC CONDUIT	100
9	RMU-9	RMU-6	50 mm ² XLPE CU	PVC CONDUIT	3,000
10	RMU-6	RMU-7	25 mm ² XLPE CU	PVC CONDUIT	1,570
11	RMU-7	RMU-8	25 mm ² XLPE CU	PVC CONDUIT	600
12	RMU-8	RMU-8_A	25 mm ² XLPE CU	PVC CONDUIT	1,200
13	RMU-8_A	RMU-8_B	25 mm ² XLPE CU	PVC CONDUIT	1,600
14	RMU-6	RMU-5	50 mm ² XLPE CU	PVC CONDUIT	900
15	RMU-5	RMU-4	50 mm ² XLPE CU	PVC CONDUIT	600
16	RMU-4	RMU-4_A	50 mm ² XLPE CU	PVC CONDUIT	10
17	RMU-4_A	RMU-3	50 mm ² XLPE CU	PVC CONDUIT	500
18	RMU-3	RMU-2	50 mm ² XLPE CU	PVC CONDUIT	600
FEEDER-2 TOTALS					10,780

FEEDER-ES					
19	NEW FOGAFALE	RISER-2	100 mm ² AAC OH	PVC CONDUIT	100
20	RISER-2	RMU-ES	25 mm ² XLPE AL	PVC CONDUIT	350
21	RMU-ES	RMU-1	50 mm ² XLPE CU	PVC CONDUIT	400
22	RMU-ES	RMU-2	50 mm ² XLPE CU	PVC CONDUIT	150
23	RMU-ES	ES AREA	25 mm ² XLPE CU	PVC CONDUIT	20
24	RMU-ES	GOV	25 mm ² XLPE CU	PVC CONDUIT	20
FEEDER-ES TOTALS					1,040
Totals for TEC Funafuti Atoll					14,880

Table 5. Distribution Circuit Breaker Data

Record No.	Location	Voltage Rating	Continuous Rating	Interrupting Rating	Type	Manufacturer
CB-F1	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-F2	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-F3	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-F4	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G1	Old Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G2	Old Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G3	Old Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G4	Old Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G5	Old Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G6	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G7	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba
CB-G8	New Fogafale Power Station	12 kV	630 A	20 kA	Vacuum	Nishishiba

Note: The dates of installation were not provided to KEMA. Ampere ratings were assumed.

Table 6. Three-phase Distribution Transformers

TR. NO.	LOCATION	FEEDER	KVA	BUS NO.	KV	Total KVA
DT-01	PHILATELIC	F-1	160	RMU-1	11	160
DT-1A	KAVATOETOE	F-1	100	RMU-1A	11	100
	FEEDER-1 TOTALS		260			260
DT-02	FAIMALAGA	F-2	150	RMU-2	11	150
DT-03	LOTA	F-2	200	RMU-3	11	200
DT-04	SEMU	F-2	200	RMU-4	11	200
DT-04A	NEW HOSPITAL	F-2	100	RMU-4A	11	100
DT-05	TCS	F-2	160	RMU-5	11	160
DT-06	FISHERIES	F-2	400	RMU-6	11	400
DT-07	LAISINI	F-2	100	RMU-7	11	100
DT-08	MATALAGI	F-2	100	RMU-8	11	100
DT-08A	FETUVALU	F-2	160	RMU-8A	11	160
DT-08B	TE AUSAGA	F-2	100	RMU-8B	11	100
DT-09	METEOROLOGICAL	F-2	200	RMU-9	11	200
	FEEDER-2 TOTALS		1,870			1,870
DT-ES	ES AREA	F-ES	200	RMU-ES	11	500
DT-GOV	GOVERNORS OFFICE	F-ES	500	RMU-ES	11	500
	FEEDER-ES TOTALS		700			700
T-SS	FOGAFALÉ PS	STA SERV	300	NEW FOGAFALÉ	11	300
	TOTALS		3,130			3,130