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LAMPIRAN - LAMPIRAN

PLN

UIW SULSELRABAR
UP2D MAKASSAR

Nomor : 0360/LIT.00.03/C16090000/2022
Lampiran : -
Sifat : Segera
Hal : Izin Penelitian dan Pengambilan Data

21 Juni 2022

Kepada

Yth. Ketua Program S3 Teknik Elektro
Universitas Hasanuddin

Di

Gowa

Sehubungan dengan surat Ketua Program S3 Teknik Elektro Universitas Hasanuddin Nomor 1377/UN4.7.8/PT.01.04/2022 Tanggal 23 Mei 2022 perihal Penelitian dan Pengambilan Data, maka dengan ini kami sampaikan bahwa pada dasarnya kami menerima permohonan penelitian atas nama **SAHABUDDIN (NIM D053202002)**.

Sehubungan dengan pandemi COVID19 maka disampaikan bahwa selama melakukan penelitian agar mahasiswa tersebut harus mematuhi prokes dan **wajib** mempunyai sertifikat vaksin sebelum melapor/masuk serta mematuhi segala peraturan dan aspek K3 di PT PLN (Persero) UP2D Makassar. Perlu juga kami sampaikan bahwa selama pelaksanaan penelitian tersebut, PT PLN (Persero) UP2D Makassar tidak menyediakan sarana transportasi maupun sarana lainnya.

Demikian disampaikan atas perhatiannya diucapkan terima kasih.

MANAGER UNIT PELAKSANA
PENGATUR DISTRIBUSI MAKASSAR,

Aulia Mahdi

Jl. Sarui No.5A Makassar
Panaikang, Wajo, Makassar, Sulawesi Selatan, 90171
Wwww.pln.co.id T (0411) 3619927 - 3634137

Paraf

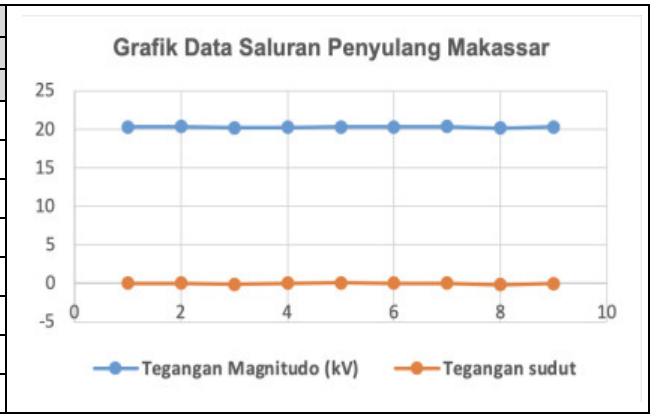
No.	Lokasi	Tegangan		Impedansi		Panjang	Daya	
		Mag	Sudut	R	X		P	Q
		(kV)	(δ)	(ohm)	(ohm)		(kW)	(kVAR)
1.	LBS Claro	20,319	0	0,669	0,047	650	83,600	24,59
2.	LBS Pga	20,352	0,033	0,668	0,047	645	27,567	8,11
3.	LBS Landak Baru	20,203	-0,149	0,68	0,047	300	117,533	34,57
4.	LBS Manual Landak	20,223	0,020	0,68	0,047	424	97,033	28,54
5.	LBS Satria	20,292	0,069	0,681	0,047	450	55,233	16,24
6.	LBS Rs Labuan Baji	20,319	0,027	0,684	0,047	436	147,133	43,27
7.	LBS Serigala	20,329	0,010	0,684	0,047	625	67,300	19,79
8.	LBS Landak	20,134	-0,195	0,681	0,047	642	138,900	40,85
9.	LBS Ikip	20,047	-0,087	0,673	0,047	520	102,433	30,13
10.	LBS Landak	20,057	0,010	0,657	0,047	625	103,167	30,34
11.	PMT P_Denpasar	20,35	0,293	0,642	0,047	7,951	108,533	31,92
12.	PMT P_Diamond	20,335	-0,015	0,634	0,047	1,09	146,067	42,96
13.	PMT P_Exp Boulevard	20,435	0,100	0,619	0,047	1,351	79,867	23,49
14.	PMT P_Hertasning Baru	20,339	-0,096	0,619	0,047	18,527	111,400	32,76
15.	PMT P_Ikip	20,597	0,258	0,618	0,047	5,727	12,267	3,61
16.	PMT P_Kassi	20,627	0,030	0,625	0,047	8,809	10,233	3,01
17.	PMT P_Kodam	20,549	-0,078	0,623	0,047	9,325	41,867	12,31
18.	PMT P_Latanete	20,596	0,047	0,632	0,047	11,101	57,600	16,94
19.	PMT P_Monginsidi Baru	20,626	0,030	0,647	0,047	2,381	108,200	31,82
20.	PMT P_Pabaeng Baeng	20,256	-0,370	0,647	0,047	3,404	112,467	33,08
21.	PMT P_Paropo	20,636	0,380	0,647	0,047	10,627	19,765	5,81
22.	PMT P_Pdam	20,245	-0,391	0,655	0,047	2,454	71,714	21,09
23.	PMT P_Pengayoman	20,157	-0,088	0,658	0,047	6,552	81,900	24,09
24.	PMT P_Perumnas	20,257	0,100	0,654	0,047	8,882	113,933	33,51
25.	PMT P_Racing Centre	20,214	-0,043	0,659	0,047	7,688	36,933	10,86
26.	PMT P_Rappocini	20,314	0,100	0,668	0,047	1,402	61,100	17,97
27.	PMT P_Salemba	20,229	-0,085	0,67	0,047	3,754	67,700	19,91
28.	PMT P_Toddopuli	20,298	0,069	0,674	0,047	5,856	63,367	18,64
29.	PMT P_Unm	20,318	0,020	0,67	0,047	4,089	146,467	43,08
30.	PMT P_Upb	20,355	0,037	0,673	0,047	1	154,767	45,52
31.	PMT P_Veteran	20,312	-0,043	0,672	0,047	5,006	67,133	19,74
32.	PMT P_Wilayah	20,342	0,030	0,675	0,047	0,495	128,000	37,64
33.	REC_Makkio Baji	20,051	-0,291	0,66	0,047	13,688	122,833	36,13
34.	REC_Uvri	20,196	0,145	0,64	0,047	14,327	81,933	24,10
35.	GH _Trans	20,196	0,000	0,632	0,047	2,0000	67,967	19,99
36.	GH Gammara	20,299	0,103	0,625	0,047	8,1350	149,800	44,06
37.	GH Indoland	20,309	0,010	0,617	0,047	0,5750	67,367	19,81
38.	GH Kolam Renang	20,426	0,117	0,617	0,047	0,1000	45,900	13,50
	H Siloam	20,339	-0,087	0,614	0,047	6,1090	69,433	20,42
	H TVRI	20,369	0,030	0,622	0,047	0,0900	87,700	25,79

No.	Lokasi	Tegangan		Impedansi		Panjang
		Mag	Sudut	R	X	
		(kV)	(δ)	(ohm)	(ohm)	
1.	PMT P_Akkarena	20,358	0,0030	0,656	0,0470	18,5210
2.	PMT P_Atmajaya	20,318	-0,0400	0,658	0,0470	8,0510
3.	PMT P_Blpp	20,397	0,0790	0,66	0,0470	2,5660
4.	PMT P_Clarion	20,407	0,0100	0,661	0,0470	2,8700
5.	PMT P_Cpi	20,181	-0,2260	0,667	0,0470	6,1330
6.	PMT P_Dg Tata	20,226	0,0450	0,668	0,0470	9,8880
7.	PMT P_Faisal	20,236	0,0100	0,665	0,0470	3,1880
8.	PMT P_Gmtdc	20,231	-0,0050	0,664	0,0470	1,0040
9.	PMT P_Gtc	20,238	0,0070	0,666	0,0470	23,7910
10.	PMT P_Hartaco	20,009	-0,2290	0,648	0,0470	5,8090
11.	PMT P_Ikip	20,249	0,2400	0,641	0,0470	2,9460
12.	PMT P_Indoland	20,256	0,0070	0,621	0,0470	5,7810
13.	PMT P_Jbd	20,463	0,2070	0,618	0,0470	3,6340
14.	PMT P_Kakatua	20,562	0,0990	0,624	0,0470	0,2390
15.	PMT P_Latanete	20,524	-0,0380	0,628	0,0470	0,8580
16.	PMT P_Malengkeri	20,578	0,0540	0,626	0,0470	10,5470
17.	PMT P_Mattoanging	20,286	-0,2920	0,685	0,0470	2,0180
18.	PMT P_Metro	20,272	-0,0140	0,628	0,0470	3,4830
19.	PMT P_Monginsidi Baru	20,284	0,0120	0,655	0,0470	10,1890
20.	PMT P_Pabaeng Baeng	20,46	0,1760	0,661	0,0470	3,5220
21.	PMT P_Rappocini	20,199	-0,2610	0,661	0,0470	8,8360
22.	PMT P_Rinra	20,209	0,0100	0,671	0,0470	5,5200
23.	PMT P_Salemba	20,266	0,0570	0,668	0,0470	12,1430
24.	PMT P_Sheraton	20,281	0,0150	0,669	0,0470	5,6780
25.	PMT P_Somba Opu	20,296	0,0150	0,671	0,0470	7,0850
26.	PMT P_Sungai Tangka	20,133	-0,1630	0,671	0,0470	0,2500
27.	PMT P_Tanjung Bunga 1	20,202	0,0690	0,672	0,0470	3,2330
28.	PMT P_Tanjung Bunga 2	20,232	0,0300	0,671	0,0470	4,7330
29.	PMT P_Trans	20,167	-0,0650	0,673	0,0470	4,7380
30.	PMT P_Unm	20,178	0,0110	0,672	0,0470	12,9860
31.	PMT P_Veteran	20,221	0,0430	0,672	0,0470	4,4300
32.	REC_Hartaco	20,251	0,0300	0,673	0,0470	8,7860
33.	REC_Pemecah Batu	20,199	-0,0520	0,674	0,0470	11,7670
34.	GH_Sungguminasa Out Basoi	20,094	-0,1050	0,688	0,0470	0,0820
35.	GH_Sungguminasa Out Malino	20,194	0,1000	0,693	0,0470	5,536
36.	GH_Sungguminasa Out Mangasa	20,134	-0,0600	0,688	0,0470	5,687
37.	PMT P_Barombong	20,142	0,0080	0,665	0,0470	5,540
38.	PMT P_Biring Bilayya	20,293	0,1510	0,65	0,0470	18,918
	MT P_Blpp	20,298	0,0050	0,646	0,0470	23,639
	MT P_Bontomanai	20,42	0,1220	0,64	0,0470	4,282
	MT P_ChenGHo	20,378	-0,0420	0,64	0,0470	34,398
	MT P_Expres Bili-Bili 1	20,388	0,0100	0,577	0,0470	21,847

No.	Lokasi	Tegangan		Impedansi		Panjang
		Mag	Sudut	R	X	
		(kV)	(δ)	(ohm)	(ohm)	
43	PMT P_Expres Bili-Bili 2	20,438	0,0500	0,701	0,0470	12,118
44	PMT P_GHsm	20,288	-0,1500	0,65	0,0470	14,402
45	PMT P_Gmtdc	20,292	0,0040	0,651	0,0470	4,809
46	PMT P_Ipdn	20,224	-0,0680	0,668	0,0470	14,993
47	PMT P_Jebar	20,089	-0,1350	0,678	0,0470	9,879
48	PMT P_Kalegowa	20,189	0,1000	0,68	0,0470	22,389
49	PMT P_Kampili	20,154	-0,0350	0,697	0,0470	15,668
50	PMT P_Mawang	20,24	0,0860	0,693	0,0470	17,959
51	PMT P_Paccellekang	20,304	0,0640	0,687	0,0470	2,089
52	PMT P_Padivalley	20,096	-0,2080	0,702	0,0470	4,934
53	PMT P_Pajalau	20,121	0,0250	0,699	0,0470	5,938
54	PMT P_Pakatto	20,126	0,0050	0,693	0,0470	14,852
55	PMT P_Parambanua	20,2	0,0740	0,695	0,0470	9,439
56	PMT P_Rindam	20,302	0,1020	0,699	0,0470	9,344
57	PMT P_Rri	20,272	-0,0300	0,697	0,0470	2,559
58	PMT P_Samata	20,238	-0,0340	0,694	0,0470	3,185
59	PMT P_Spma	20,242	0,0040	0,678	0,0470	18,611
60	PMT P_Tamarunang	20,484	0,2420	0,661	0,0470	20,045
61	PMT P_Tanjung Aliya	20,492	0,0080	0,657	0,0470	3,897
62	PMT P_Yapika	20,366	-0,1260	0,645	0,0470	22,373
63	PMT_Pallangga	20,341	-0,0250	0,643	0,0470	12,545
64	REC_Borong Taipa	20,536	0,1950	0,646	0,0470	10,117
65	REC_Cambayya	20,556	0,0200	0,648	0,0470	5,217
66	REC_Dato	20,452	-0,1040	0,656	0,0470	11,127
67	REC_Pakatto	20,543	0,0910	0,664	0,0470	3,170
68	REC_Pattalassang	20,146	-0,3970	0,614	0,0470	25,127
69	REC_Rafis	20,201	0,0550	0,647	0,0470	22,636
70	REC_Tallang Tallang	20,254	0,0530	0,651	0,0470	13,725

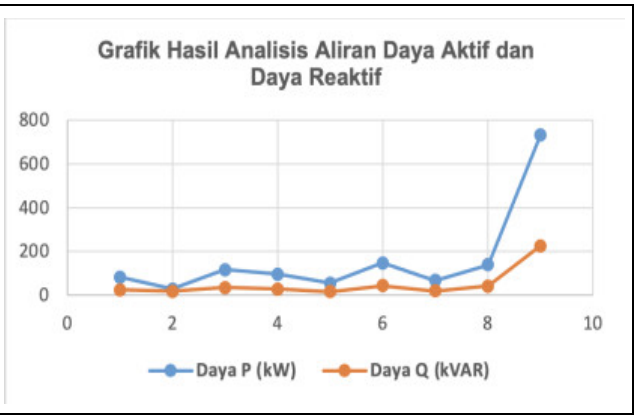
Tabel 3.
Grafik Data Saluran Penyulang Makassar

Bus Awal	Bus Tujuan	Tegangan	
		Mag	Sudut
		(kV)	(δ)
1	2	20,319	0
2	3	20,352	0,0330
3	4	20,203	-0,1490
4	5	20,223	0,0200
5	6	20,292	0,0690
6	7	20,319	0,0270
7	8	20,329	0,0100
8	9	20,134	-0,1950



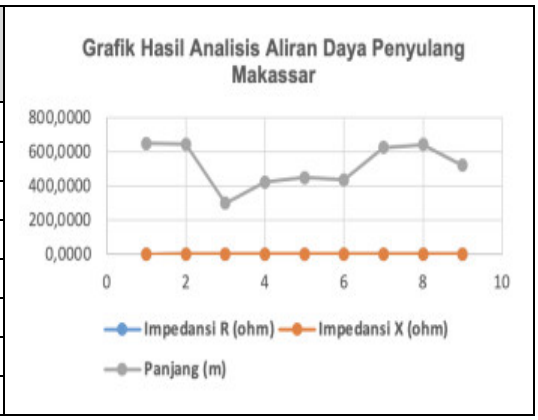
Tabel 4.
Grafik Hasil Analisis Aliran Daya Aktif dan Daya Reaktif

Bus Awal	Bus Tujuan	Daya	
		P	Q
		(kW)	(kVAR)
1	2	84	25
2	3	28	18
3	4	118	35
4	5	97	29
5	6	55	16
6	7	147	43
7	8	67	20
8	9	139	41



Tabel 5.
Grafik Hasil Analisis Aliran Daya Penyulang Makassar

Bus Awal	Bus Tujuan	Daya		Panjang
		P	Q	
		(kW)	(kVAR)	
1	2	84	25	650
2	3	28	18	645
3	4	118	35	300
4	5	97	29	424
5	6	55	16	450
6	7	147	43	436
7	8	67	20	625
	9	139	41	642



DEKLARASI KESIAPAN TRAFO DAN KONSUMEN TEGANGAN TINGGI/DAYA MAMPU PASOK TRAFO (MVA AVAILABLE) UNIT PELAYANAN TRANSMISI (UPT) MAKASSAR TAHUN 2022

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
	GI Panakkukang 150 kV													
1	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
2	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
3	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Panakkukang 150 kV													
4	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
5	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
6	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Bontoala 70 kV													
7	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
8	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
	GIS Bontoala 150 kV													
9	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
10	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
	GIS Sungguminasa 150 kV													
11	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
		60	60	60	60	60	60	60	60	60	60	60	60	60
	jung Bunga 150 kV													

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
13	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
14	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
15	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Borongloe 70 kV													
16	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
	GI Bollangi 150 kV													
17	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
18	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Lanna 150 kV													
19	DIST	30	-	-	-	-	-	-	30	30	30	30	30	30
	GI Tello 150 kV													
20	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
21	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Daya 70 kV													
22	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
23	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
	GI Daya Baru 150 kV													
24	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Kima 150 kV													
25	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
		60	60	60	60	60	60	60	60	60	60	60	60	60
	dai 70 kV													

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
27	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
28	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
	GI Maros 150 kV													
29	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
30	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Pangkep 150 kV													
31	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
32	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
33	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Pare-Pare 150 kV													
34	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
35	DIST 2	16	16	16	16	16	16	16	16	16	16	16	16	16
36	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Ballusu 150 kV													
37	DIST 1	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3	6.3
	GI Barru 150 kV													
38	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
	GI Pinrang 150 kV													
39	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
40	DIST 2	16	16	16	16	16	16	16	16	16	16	16	16	16
		30	30	30	30	30	30	30	30	30	30	30	30	30
	ru 150 kV													

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
42	DIST	20	20	20	20	20	20	20	20	20	20	20	20	20
	GI Sidrap 150 kV													
43	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
44	DIST 2	30	-	-	-	-	-	-	-	-	-	-	-	-
45	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Soppeng 150 kV													
46	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
47	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
48	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Sengkang 150 kV													
49	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
50	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
51	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Makale 150 kV													
52	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
53	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Enrekang 150 kV													
54	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Bulukumba 150 kV													
55	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
		30	30	30	30	30	30	30	30	30	30	30	30	30
		60	30		60	60	60	60	60	60	60	60	60	60

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
	GI Bone 150 kV													
58	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
59	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
60	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Sinjai 150 kV													
61	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
62	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
63	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Jeneponto 150 kV													
64	DIST 1	20	20	20	20	20	20	20	20	20	20	20	20	20
65	DIST 2	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Tallasa 150 kV													
66	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
67	DIST 2	20	20	20	20	20	20	20	20	20	20	20	20	20
68	DIST 3	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Punagaya 150 kV													
69	DIST	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Bantaeng New 150 kV													
70	DIST	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Punwatu 150 kV													
		20	20	20	20	20	20	20	20	20	20	20	20	20
		30	30	30	30	30	30	30	30	30	30	30	30	30

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
73	DIST 3	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI NII Tanasa 150 kV													
74	DIST 1	10	10	10	10	10	10	10	10	10	10	10	10	10
	GI Kendari New 150 kV													
75	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
76	DIST 2	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Unaaha 150 kV													
77	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Kolaka 150 kV													
78	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Lasusua 150 kV													
79	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Wolo 150 kV													
80	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Moramo 150 kV													
81	DIST 1	60	60	60	60	60	60	60	60	60	60	60	60	60
	GI Andoolo 150 kV													
82	DIST 1	30	30	30	30	30	30	30	30	30	30	30	30	30
	GI Kasipute 150 kV													
83	DIST 1	30	-	-	-	-	-	-	30	30	30	30	30	30
	owa 150 kV													

No.	Jumlah Trafo/KIT	TRAFO KIT												
		MVA Terpasang	MVA Deklarasi (MVA)											
		(MVA)	Jan	Feb	Mar	Apr	Mei	Juni	Juli	Aug	Sept	Okt	Nov	Des
84	Konsumen Tegangan Tinggi	68	68	68	68	68	68	68	68	68	68	68	68	68
	GI Tonasa 70 kV													
85	Konsumen Tegangan Tinggi	94.5	94.5	94.5	94.5	151.5	151.5	151.5	151.5	151.5	151.5	151.5	151.5	151.5
	GI Hijadi 150 kV													
86	Konsumen Tegangan Tinggi	210	210	210	210	210	210	210	210	210	210	210	210	210
Total		**3310.8**	**3190.8**	**3190.8**	**3220.8**	**3277.8**	**3277.8**	**3277.8**	**3337.8**	**3337.8**	**3337.8**	**3337.8**	**3337.8**	**3337.8**
Presentasi Deklarasi			**96%**	**96%**	**97%**	**99%**	**99%**	**99%**	**101%**	**101%**	**101%**	**101%**	**101%**	**101%**

LAPORAN HARIAN BEBAN PENYULANG TRAFO – GI
JANUARI 2022

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
1		**GI BONTOALA**											
2		**INCOMING #1 20 MVA**	578 A										
3		**INCOMING #2 20 MVA**	578 A										
4		**GI BOLANGI**											
5		**INCOMING #1 60 MVA**	1734 A		368	395	390	407	423	508	504	407	508
6		**TEGANGAN**			20,47	20,48	20,51	20,49	20,54	20,49	20,45	21	21
7	MS	P_PADIVALLEY		384	0	7	0	0	-	7	8	7	8
8	MS	P_BONTOMANAI		384	63	62	64	65	65	76	74	65	76
9	MU	P_ROYAL		600	34	36	39	38	39	47	55	39	55
10	MU	P_MONCONGLOE		600	-	-	-	-	-	-	-	0	0
11	MS	P_PACCELLEKANG		600	26	26	26	26	29	36	68	26	68
12	MS	P_BIRING BILAYYA		600	29	41	31	41	59	72	70	41	72
13	MS	P_CHENGHO		600	54	55	60	59	60	70	71	60	71
14	MS	P_SAMATA		600	83	87	89	88	95	112	114	89	114
15	MS	P_SPMA		384	43	45	44	47	44	51	50	47	51
16	MS	P_YAPIKA		384	26	27	28	27	26	31	32	28	32
17		**GIS BONTOALA**											
18		**INCOMING #1 60 MVA**	1734 A		452	531	534	527	559	589	567	534	589
19		**TEGANGAN**			20,4	20,52	20,54	20,56	20,54	20,5	20,54	21	21
		_BULUSALAKA		402	49	58	59	57	61	63	62	59	63
		_BMA		402	80	85	89	85	93	101	100	89	101
		_BAWAKARAENG		420	55	59	61	61	64	71	68	61	71

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
23	MU	P_MATTOANGIN		402	83	87	81	82	98	101	90	87	101
24	MU	P_ANDALAS		420	53	53	53	53	59	62	61	53	62
25	MS	P_JBD		402	64	119	124	123	118	123	120	124	123
26	MU	P_PELAMONIA		400	65	67	66	64	63	64	63	67	64
27	MU	P_RUJAB		402	-	-	-	-	-	-	-	0	0
28		**INCOMING #2 60 MVA**	1734 A		434	510	505	502	484	473	429	510	484
29		**TEGANGAN**			20,26	20,54	20,5	20,55	20,57	20,57	20,58	21	21
30	MU	P_AHMAD YANI		600	56	62	63	65	65	63	64	65	65
31	MU	P_MESJID RAYA		600	63	64	65	64	67	74	72	65	74
32	MU	P_AKADEMIS		400	75	105	109	109	89	76	51	109	89
33	MU	P_SUNGAI TANGKA		402	113	116	117	116	116	123	118	117	123
34	MU	P_SUDIRMAN		300	39	41	42	41	38	41	40	42	41
35	MU	P_POLDA		400	23	55	56	54	53	43	28	56	53
36	MU	P_LOSARI		400	53	53	53	53	54	55	53	53	55
37	MU	P_TPM		-	-	-	-	-	-	-	-	-	-
38		**GI BORONGLOE**											
39		**INCOMING #1 20 MVA**	578 A		317	339	336	332	297	264	269	339	297
40		**TEGANGAN**			20,2	20,09	20,1	20,13	20,01	20,01	20,05	20	20
41	MS	P_TIELINE BILI 1		-	187	197	196	194	177	168	167	197	177
42	MS	P_TIELINE BILI 2		-	195	199	198	199	189	182	182	199	189
43	MS	P_UIN		-	-	-	-	-	-	-	-	0	0
44	MS	P_RINDAM		220	4	4	4	4	4	4	6	4	6
		_MAWANG		300	9	9	9	9	9	12	12	9	12
		_KAMPILI		300	28	28	29	31	32	38	38	31	38
		_PALLANGGA		300	41	44	44	46	48	57	60	46	60

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
48		**GI DAYA**											
49		**INCOMING #1 20 MVA**	578 A		90	97	96	98	94	103	106	98	106
50		**TEGANGAN**			20,56	20,45	20,48	20,5	20,53	20,49	20,48	21	21
51	MU	P_SANMARU		300	42	44	41	43	37	36	40	44	40
52	MU	P_GOLF		300	53	53	55	57	58	67	66	57	67
53		**INCOMING #2 20 MVA**	578 A		282	289	297	300	317	358	346	300	358
54		**TEGANGAN**			20,48	20,6	20,64	20,66	20,42	20,36	20,36	21	20
55	MU	P_BADDOKA		400	81	82	81	82	90	96	94	82	96
56	MU	P_PACCERAKKANG		400	158	163	169	170	179	205	199	170	205
57	MU	P_SANRANGAN		300	42	43	46	47	48	55	51	47	55
58		**GI. DAYA NEW**											
59		**INCOMING # 1 60 MVA**	578 A		234	240	240	240	250	297	286	240	297
60		**TEGANGAN**			20,5	20,5	20,5	20,6	20,6	20,6	20,5	21	21
61	MU	P_MARANNU		600	153	158	157	156	167	202	196	158	202
62	MU	P_ZIPUR		600	60	61	61	62	61	67	63	62	67
63	MU	P_DB 2		660	19	19	20	20	21	26	26	20	26
64		**GI. KIMA**											
65		**INCOMING # 1 30 MVA**	867 A		194	190	172	188	186	193	205	194	205
66		**TEGANGAN**			20,43	20,5	20,57	20,55	20,55	20,55	20,48	21	21
67	MU	P_ALUMINIUM		300	26	24	23	16	20	20	18	26	20
68	MU	P_SALODONG		330	69	69	54	61	62	62	62	69	62
69	MU	P_POKPHAND		300	100	98	93	108	105	112	128	108	128
		NCOMING # 2 60 MVA	1734 A		321	351	351	354	303	306	295	354	306
		EGANGAN			20,54	20,59	20,4	20,4	20,5	20,4	20,54	21	21
		_WIKA		300	47	53	56	75	51	53	51	75	53

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
73	MU	P_BONTOA		600	66	66	69	56	56	58	62	69	62
74	MU	P_KIMA BARU		400	29	41	42	40	26	27	47	42	47
75	MU	P_EFFEM BARU		400	46	51	53	52	49	51	27	53	51
76	MU	P_KAPASA BARU		400	48	48	50	44	45	50	46	50	50
77	MU	P_PONDOK SAWAH		600	85	89	83	91	72	66	61	91	72
78		**GI. MANDAI**											
79		**INCOMING # 1 20 MVA**	578 A		205	210	210	223	234	269	269	223	269
80		**TEGANGAN**			20,63	20,45	20,45	20,4	20,52	20,55	20,46	21	21
81	MU	P_AURI		300	50	53	57	60	60	66	66	60	66
82	MU	P_BANDARA		300	35	35	36	38	41	45	46	38	46
83	MU	P_PALISI		300	58	60	60	62	65	75	74	62	75
84	MU	P_GOMBARA		300	62	59	66	61	64	79	78	66	79
85		**INCOMING # 2 20 MVA**	578 A		189	196	199	204	196	214	212	204	214
86		**TEGANGAN**			20,2	20,2	20,13	20,15	20,02	20,1	20	20	20
87	MU	P_MAROS		390	16	17	18	18	18	20	20	18	20
88	MU	P_UJUNG PANDANG		400	94	98	102	103	109	122	123	103	123
89	MU	P_AIRPORT		400	20	21	20	21	23	26	25	21	26
90	MU	P_ANGKASA 2		400	62	62	62	64	48	48	46	64	48
91	MU	P_ANGKASA 1		400	6	6	6	6	6	6	6	6	6
92		**GI. M A R O S**											
93		**INCOMING # 1 30 MVA**	867 A		137	138	142	144	158	196	194	144	196
94		**TEGANGAN**			20,46	20,48	20,5	20,49	20,55	20,54	20,48	21	21
		NCOMING # 2 60 MVA	1734 A		357	373	368	370	400	461	447	373	461
		EGANGAN			20,45	20,41	20,45	20,47	20,38	20,41	20,39	20	20
		_LEMPANGAN		300	-	-	-	-	-	-	-	0	0

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
98	MU	P_TAMBUA		300	115	117	121	120	136	167	166	121	167
99	MU	P_BOSOWA		300	21	20	20	24	22	28	27	24	28
100	MU	P_TURIKALE		300	-	-	-	-	-	-	-	0	0
101	MU	P_SALEWANGAN		600	118	124	121	123	132	153	149	124	153
102	MU	P_GRAND MALL		600	112	118	117	119	122	132	128	119	132
103	MU	P_TEH GELAS		600	54	57	55	55	62	71	71	57	71
104	MU	P_CAMBA		300	74	74	75	73	87	107	102	75	107
105		**GI. PANAKKUKANG**											
106		**INCOMING # 1 60 MVA**	1734 A		663	702	735	746	773	833	831	746	833
107		**TEGANGAN**			20,6	20,38	20,4	20,4	20,4	20,38	20,38	21	20
108	MS	P_WILAYAH		150	3	3	3	3	3	3	3	3	3
109	MS	P_ADYAKSA		384	14	16	15	15	17	18	17	16	18
110	MS	P_RAPPOCINI		384	122	129	136	135	148	163	163	136	163
111	MS	P_VETERAN		384	84	91	94	94	98	101	99	94	101
112	MS	P_LATANETE		384	69	77	80	79	78	81	78	80	81
113	MS	P_IKIP		384	32	34	36	37	37	38	39	37	39
114	MS	P_UNM		384	102	105	112	115	117	124	122	115	124
115	MS	P_PERUMNAS		384	92	95	99	103	112	125	126	103	126
116		**INCOMING # 2 60 MVA**	1734 A		656	758	813	834	839	879	836	834	879
117		**TEGANGAN**			20,45	20,47	20,47	20,47	20,52	20,47	20,48	20	21
118	MS	P_DENPASAR		300	125	131	136	139	140	150	150	139	150
119	MS	P_PENGAYOMAN			82	94	120	120	125	128	123	120	128
		_CLARION		402	45	51	54	59	60	61	63	59	63
		_MONGINSIDI		300	78	90	93	97	102	107	106	97	107
		_DIAMOND		300	34	45	48	46	41	40	40	48	41

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
123	MS	P_BOULEVARD		600	77	122	126	132	116	115	75	132	116
124	MS	P_SALEMBA		600	100	115	110	112	127	139	137	115	139
125	MS	P_FAISAL		600	3	3	3	3	3	3	3	3	3
126	MS	P_TODDOPULI		600	110	105	120	122	122	134	138	122	138
127		**INCOMING # 3 30 MVA**	867 A						-	-	-	0	0
128		**TEGANGAN**							-	-	-	0	0
129	MS	P_ALAUDDIN		360	74	80	83	85	93	102	106	85	106
130	MS	P_SHERATON		360	26	25	25	26	15	13	14	26	15
131	MS	P_HERTASNING BARU		400	-	-	-	-	-	-	-	0	0
132	MS	P_PABAENG BAENG		400	41	41	45	45	48	55	57	45	57
133	MS	P_EXPRESS BOULEVARD			-	-	-	-	-	-	-	0	0
134	MS	P_KAKATUA			-	-	-	-	-	-	-	0	0
135	MS	P_UPB			-	-	-	-	-	-	-	0	0
136		**GI. PANGKEP**											
137		**INCOMING # 3 60 MVA**	1734 A						-	-	-		
138		**TEGANGAN**							-	-	-		
139		**INCOMING # 4 20 MVA**	578 A		213	218	223	216	240	282	273	223	282
140		**TEGANGAN**			20,53	20,54	20,52	20,56	20,55	20,59	20,54	21	21
141	MU	P_SEGERI		210	117	120	123	119	135	156	149	123	156
142	MU	P_MINASATENE		300	96	97	99	96	104	126	121	99	126
143		**INCOMING # 5 30 MVA**	867 A		271	272	270	268	291	348	340	272	348
144		**TEGANGAN**			20,4	20,35	20,35	20,4	20,42	20,44	20,37	20	20
		_GUNUNG MAS		300	90	91	89	85	94	109	104	91	109
		_PANGKEP		300	153	148	163	159	178	215	211	163	215
		_SILORO		300	27	27	19	24	22	26	25	27	26

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
148		**PLTA BILI-BILI**											
149	MS	P_LANNA		120	3	3	3	3	4	5	4	3	5
150	MS	P_PAKATTO		200	55	55	56	55	59	69	66	56	69
151		**PLTA TANGKA**											
152	MS	P_TOMBOLO			30	33	34	29	-	-	-	34	0
153		**GI. SUNGGUMINASA**											
154		**INCOMING # 1 60 MVA**	1734 A		331	337	337	339	361	427	428	339	428
155		**TEGANGAN**			20,51	20,55	20,55	20,58	20,58	20,57	20,55	21	21
156	MS	P_TAMARUNANG		600	115	119	121	122	129	146	146	122	146
157	MS	P_IPDN		300	25	25	26	25	27	34	33	26	34
158	MS	P_BAROMBONG		300	107	108	108	108	114	134	136	108	136
159	MS	P_PAJALAU		600	84	85	85	82	93	115	115	85	115
160		**INCOMING # 2 60 MVA**	1734 A		529	543	547	548	585	686	673	548	686
161		**TEGANGAN**			20,44	20,44	20,43	20,46	20,51	20,46	20,48	20	21
162	MS	P_GMTDC		600	141	145	152	153	165	187	189	153	189
163	MS	P_RRI		600	90	90	90	90	96	117	116	90	117
164	MS	P_GHSM		600	116	119	121	124	127	142	138	124	142
165	MS	P_PARAMBANUA		330	109	106	104	101	111	140	131	109	140
166	MS	P_KALEGOWA		300	78	81	82	82	86	102	104	82	104
167		**GI. TALLASA**											
168		**INCOMING # 1 60 MVA**	1734 A		269	275	270	255	176	211	210	275	211
169		**TEGANGAN**			20,5	20,5	20,5	20,5	20,4	20,5	20,52	20,5	20,52
		_MALEWANG		360	114	114	112	103	125	157	156	114	157
		NCOMING # 2 20 MVA	578 A		-	-	-	-	-	-	-	-	-
		EGANGAN			-	-	-	-	-	-	-	-	-

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
173	MS	P_GALESONG		300	100	104	103	100	121	142	142	0	0
174	MS	P_LENGKESE		300	55	57	55	52	61	74	72	0	0
175		**INCOMING # 3 30 MVA**	867 A		158	166	150	154	172	209	208	166	209
176		**TEGANGAN**			20,4	20,6	20,4	20,4	20,5	20,4	20,4	20,6	20,5
177	MS	P_PABRIK GULA		240	99	107	92	94	106	132	134	107	134
178	MS	P_TEGAL		300	1	1	1	1	2	2	2	1	2
179	MS	P_PALLEKO		300	57	58	57	58	64	75	73	58	75
180		**GI. TALLO LAMA**											
181		**INCOMING # 1 30 MVA**	867 A		2	2	2	2	2	2	2	2	2
182		**TEGANGAN**			20,4	20,5	20,4	20,5	20,4	20,5	20,52	21	21
183	MU	P_REFORMASI		400	2	2	2	2	2	2	2	2	2
184		**INCOMING # 2 30 MVA**	867 A		149	148	151	156	134	140	154	156	154
185		**TEGANGAN**			20,39	20,46	20,46	20,46	20,52	20,51	20,47	20	21
186	MU	P_TOL		400	63	65	66	68	67	72	79	68	79
187	MU	P_PELINDO		400	63	65	66	67	45	46	50	67	50
188	MU	P_INDOFOOD 1		400	18	17	15	16	20	18	22	18	22
189	MU	P_INDOFOOD 2			-	-	-	-	-	-	-	0	0
190	MU	P_INDOFOOD 3			-	-	-	-	-	-	-	0	0
191		**INCOMING # 3 60 MVA**	1734 A		531	546	562	559	592	650	660	562	660
192		**TEGANGAN**			20,49	20,56	20,53	20,54	20,58	20,58	20,56	21	21
193	MU	P_RANTEMARIO		600	19	20	21	20	22	25	25	21	25
194	MU	P_CARAKA		400	49	49	54	53	59	62	62	54	62
		_LAKKANG		384	15	15	16	16	17	19	19	16	19
		_BARAWAJA		300	59	61	63	62	67	76	76	63	76
		_NEW PORT 2		384	3	3	3	3	3	3	3	3	3

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
198	MU	P_SUNU		600	121	123	128	118	127	139	140	128	140
199	MU	P_TEUKU UMAR		600	88	91	93	95	103	111	114	95	114
200	MU	P_NEW PORT 1		384	4	8	3	7	3	5	8	8	8
201	MU	P_PAOTERE		600	87	89	91	96	96	103	107	96	107
202	MU	P_PANAMPU		600	87	87	89	88	96	106	105	89	106
203		**GI. TELLO 150**											
204		**INCOMING # 2 60 MVA**	1734 A		692	714	752	748	809	898	885	752	898
205		**TEGANGAN**			20,65	20,37	20,34	20,36	20,43	20,39	20,39	21	20
206	MS	P_KASSI		400	123	127	133	132	148	165	167	133	167
207	MU	P_URIP		300	50	53	54	54	61	66	62	54	66
208	MS	P_PAROPO		399,6	89	93	96	90	99	109	108	96	109
209	MU	P_UNHAS		402	52	52	54	56	61	65	60	56	65
210	MU	P_TAMALANREA		399,6	55	57	60	61	64	70	69	61	70
211	MU	P_BTP		600	90	93	98	98	105	120	120	98	120
212	MS	P_ASABRI		600	81	79	89	91	94	107	105	91	107
213	MU	P_WAHIDIN		300	28	34	34	35	32	34	31	35	34
214	MS	P_ANTANG		600	66	68	71	70	77	86	87	71	87
215	MS	P_RACING		600	52	53	56	56	61	69	68	56	69
216		**GI. TELLO 30**											
217		**INCOMING # 1 60 MVA**	1734 A		389	445	469	485	505	539	525	485	539
218		**TEGANGAN**			20,45	20,46	20,44	20,44	20,5	20,46	20,48	20	21
219	MU	P_POLTEK		402	41	43	45	45	48	53	52	45	53
		_PAM		300	33	33	33	33	33	33	33	33	33
		_BUKIT BARUGA		402	40	43	45	44	49	54	52	45	54
		_KODAM		600	63	66	72	73	77	84	81	73	84

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
223	MU	P_NIPAH 1		600	23	47	49	52	50	51	50	52	51
224	MU	P_MTOS		402	84	95	105	111	110	117	111	111	117
225	MU	P_NIPAH 2		600	3	3	3	3	3	3	3	3	3
226	MU	P_PANAIKANG		400	3	3	3	3	4	5	5	3	5
227	MU	P_RAIDER		320	91	97	99	100	108	122	120	100	122
228	MU	P_WORKSHOP		320	13	14	14	14	14	14	14	14	14
229	MU	P_FKS		320	9	10	9	10	10	10	10	10	10
230		**GI. TANJUNG BUNGA**											
231		**INCOMING # 1 60 MVA**	1734 A		441	475	488	387	644	722	710	488	722
232		**TEGANGAN**			20,49	20,49	20,5	20,48	20,51	20,51	20,55	21	21
233	MS	P_ATMAJAYA		600	113	117	124	125	132	145	143	125	145
234	MS	P_BLPP		540	145	147	150	145	158	189	189	150	189
235	MS	P_AKKARENA		480	90	107	107	11	120	115	103	107	120
236	MS	P_GTC		600	93	104	107	106	109	121	125	107	125
237	MS	P_JEBAR		300	59	58	59	58	61	86	84	59	86
238	MS	P_TANJUNG ALIYAH		300	53	53	55	55	54	69	72	55	72
239		**INCOMING # 2 60 MVA**	1734 A		280	303	317	324	329	345	280	324	345
240		**TEGANGAN**			20,4	20,33	20,61	20,64	20,63	20,6	20,58	21	21
241	MS	P_INDOLAND		240	-	-	-	-	-	-	-	-	-
242	MS	P_METRO		330	-	-	-	-	-	-	-	-	-
243	MS	P_GONTANG		255	-	-	-	-	-	-	-	-	-
244	MS	P_HARTACO		600	22	22	22	23	24	27	27	23	27
		_BENTENG S. OPU		300	131	132	140	144	151	164	163	144	164
		_TRANS		600	124	147	154	156	154	155	76	156	155
		NCOMING # 3 60 MVA	1734 A		299	306	323	329	350	374	375	329	375

No.	UP3	PENYULANG	SET. TR	SET. PENY	MAXIMUM (SIANG)				MAXIMUM (MALAM)			MAXIMUM	
					10	11	12	14	18	19	20	SIANG	MALAM
248		**TEGANGAN**			20,36	20,34	20,28	20,32	20,35	20,4	20,51	20	21
249	MS	P_RINRA		600	92	94	100	102	113	120	121	102	121
250	MS	P_CPI		600	103	100	106	108	109	113	111	108	113
251	MS	P_MALLENGKERI		384	56	60	65	64	70	75	76	65	76
252	MS	P_DAENG TATA		384	47	49	51	53	58	64	65	53	65
253	MS	P_TANJUNG BUNGA 1			-	-	-	-	-	-	-	-	-
254	MS	P_TANJUNG BUNGA 2			-	-	-	-	-	-	-	-	-
255		**PLTD TANAKEKE**											
256	MS	P_TANAKEKE			-	-	-	-	-	-	-	-	-

BEBAN SISTEM	UP3	BEBAN PUNCAK							TERTINGGI			
		SIANG				MALAM			SIANG		MALAM	
		10	11	12	14	18	19	20	AMPER	MW	AMPER	MW
	MAKASSAR SELATAN	5219	5564	5721	5647	5998	6662	6544	5721	168	6662	196
	MAKASSAR UTARA	4565	4803	4872	4905	5031	5531	5418	4905	144	5531	163
	TOTAL	**9784**	**10367**	**10593**	**10552**	**11029**	**12193**	**11962**	**10626**	**313**	**12193**	**359**

GARDU INDUK SCADA	**15**
GARDU INDUK BELUM SCADA	**1**
PENYULANG SCADA	**133**
PENYULANG BELUM SCADA	**30**
INCOMING SCADA	**31**
UM SCADA	**2**

Lampiran 222	Algoritma Backward Forward Sweep (BFS)
Source Code	Matlab R2021b

```
clc;
clear all;
format short;
tic
m=load('loaddata15bus.m');
l=load('linedata15bus.m');

% m=load('loaddata15bus.m');
% l=load('linedata15bus.m');

br=length(l);
no=length(m);
f=0;
d=0;
MVAb=100;
KVb=12.3;
Zb=(KVb^2)/MVAb;
% Per unit Values
for i=1:br
   R(i,1)=(l(i,4))/Zb;
   X(i,1)=(l(i,5))/Zb;
end
for i=1:no
   P(i,1)=((m(i,2))/(1000*MVAb));
   Q(i,1)=((m(i,3))/(1000*MVAb));
end
R;
X;
P;
Q;
C=zeros(br,no);
for i=1:br
   a=l(i,2);
   b=l(i,3);
   for j=1:no
      if a==j
         C(i,j)=-1;
      end
      if b==j
         C(i,j)=1;
```

```
for i=1:no
   d=0;
   for j=1:br
      if C(j,i)==-1
         d=1;
      end
   end
   if d==0
      endnode(e,1)=i;
      e=e+1;
   end
end
endnode;
h=length(endnode);
for j=1:h
   e=2;
   f=endnode(j,1);
  % while (f~=1)
  for s=1:no
   if (f~=1)
     k=1;
     for i=1:br
        if ((C(i,f)==1)&&(k==1))
           f=i;
           k=2;
        end
     end
     k=1;
     for i=1:no
        if ((C(f,i)==-1)&&(k==1));
           f=i;
           g(j,e)=i;
           e=e+1;
           k=3;
        end
     end
   end
  end
end
for i=1:h
   g(i,1)=endnode(i,1);
end
g;
    (g(1,:));
```

```
:no
=1:w
```

```
            if g(i,t)==k
               g(i,t)=g(i,j);
               g(i,j)=k;
               j=j+1;
             end
          end
      end
end
g;
for k=1:br
   e=1;
   for i=1:h
      for j=1:w-1
         if (g(i,j)==k)
            if g(i,j+1)~=0
               adjb(k,e)=g(i,j+1);
               e=e+1;
            else
               adjb(k,1)=0;
            end
          end
      end
   end
end
adjb;
for i=1:br-1
   for j=h:-1:1
      for k=j:-1:2
         if adjb(i,j)==adjb(i,k-1)
            adjb(i,j)=0;
         end
      end
   end
end
adjb;
x=length(adjb(:,1));
ab=length(adjb(1,:));
for i=1:x
   for j=1:ab
      if adjb(i,j)==0 && j~=ab
         if adjb(i,j+1)~=0
            adjb(i,j)=adjb(i,j+1);
            adjb(i,j+1)=0;
           ıd

           jb(i,j)~=0
           ljb(i,j)=adjb(i,j)-1;
```

```
    end
end
adjb;
for i=1:x-1
    for j=1:ab
        adjcb(i,j)=adjb(i+1,j);
    end
end
b=length(adjcb);

% voltage current program

for i=1:no
    vb(i,1)=0.99;
end
for s=1:10
for i=1:no
    nlc(i,1)=conj(complex(P(i,1),Q(i,1)))/(vb(i,1));
end
nlc;
for i=1:br
    Ibr(i,1)=nlc(i+1,1);
end
Ibr;
xy=length(adjcb(1,:));
for i=br-1:-1:1
    for k=1:xy
        if adjcb(i,k)~=0
            u=adjcb(i,k);
            %Ibr(i,1)=nlc(i+1,1)+Ibr(k,1);
            Ibr(i,1)=Ibr(i,1)+Ibr(u,1);
        end
    end
end
Ibr;
for i=2:no
     g=0;
     for a=1:b
         if xy>1
           if adjcb(a,2)==i-1
              u=adjcb(a,1);
              vb(i,1)=((vb(u,1))-((Ibr(i-1,1))*(complex((R(i-1,1)),X(i-1,1)))));
              g=1;
             id
              adjcb(a,3)==i-1
              u=adjcb(a,1);
              vb(i,1)=((vb(u,1))-((Ibr(i-1,1))*(complex((R(i-1,1)),X(i-1,1)))));
              g=1;
```

```
            end
          end
        end
        if g==0
           vb(i,1)=((vb(i-1,1))-((Ibr(i-1,1))*(complex((R(i-1,1)),X(i-1,1)))));
        end
end
s=s+1;
end
nlc;
Ibr;
vb;
vbp=[abs(vb) angle(vb)*180/pi];


for i=1:1
vbp(i,1)=abs(vb(i));
vbp(i,2)=angle(vb(i))*(180/pi)
end


toc;
for i=1:no
   va(i,2:3)=vbp(i,1:2);
end
for i=1:no
   va(i,1)=i;
end
va;


Ibrp=[abs(Ibr) angle(Ibr)*180/pi];
PL(1,1)=0;
QL(1,1)=0;

% losses
for f=1:br
   Pl(f,1)=(Ibrp(f,1)^2)*R(f,1);
   Ql(f,1)=X(f,1)*(Ibrp(f,1)^2);
   PL(1,1)=PL(1,1)+Pl(f,1);
   QL(1,1)=QL(1,1)+Ql(f,1);
end

   =(Pl)*100000;
   =(Ql)*100000;
   *100000;
   )*100000;
```

```
voltage = vbp(:,1);
angle = vbp(:,2)*(pi/180);
plot(m(:,1),abs(voltage));
% hold on

% Plosskw
sum(Plosskw );
sum(Qlosskw);

%
Plosskw(15,1)=PL;
Qlosskw(15,1)=QL;

sprintf('Power-Loss=%d KW ' ,PL')
sprintf('Power-Loss=%d KVAr',QL')
%sprintf('Power-Loss=%d KW, Power-Loss=%d KVAr' ,PL,QL')
Sr=(1:15)';

%plot(voltage)
%plot(P)
%plot(Q)
%plot(R)
%plot(X)

   %% EXCEL FOR DG
%T =table(Sr,Plosskw,Qlosskw,angle,voltage);
%T(:,1:5);
%excel_file = 'loaddata33bus.xlsx';
%writetable(T,excel_file,'Sheet1',1,'Range','A1:C33')
```

Lampiran 222	Algoritma Particle Swarm Optimization
Source Code	Matlab R2021b

```
clc
tic
 %(INITIALIZING SWARM PARAMETER)
n=20;
dim=5;% Dimmension of searching space
x=load('swarm33.m');% Creating a swarm
vnew=rand(n,dim);% Creating a randomized initial velocity
sig=zeros(n,dim);
vold=vnew;
fitness=zeros(1,n);
pbest=load('swarm33.m');% Creating pbest matrice
gbest=[4 10 24 30 12];% Introducing a randomized gbest
wmax=0.9;
wmin=0.4;
r1=rand(n,dim);% Creating a randomized matrice, size (20x3)
r2=rand(n,dim);% Creating a randomized matrice, size (20x3)
iter=0;
maxiter=60;% Maximum iteration
tap=[8 9 10 11 21 33 35 0 0
    2 3 4 5 6 7 18 19 20
    12 13 14 34 0 0 0 0 0
    15 16 17 29 30 31 36 32 0
    22 23 24 25 26 27 28 37 0];
ta=tap';
% Establish the incidence matrix
data=loadcase(case33);
doc=data.branch;
nhanh=37;
nut=33;
matrix=zeros(nhanh,nut);
    nutdau=doc(:,1);
    nutcuoi=doc(:,2);
for i=1:nhanh
matrix(i,nutdau(i))=1;
matrix(i,nutcuoi(i))=1;
end

 % Calculating fitness function for pbest
 fpbest=zeros(1,n);
 for i=1:n
                (i)=50000;

                oops
                <maxiter
                r+1;
```

```
    w=wmax-(wmax-wmin)*iter/maxiter;% Specilize the weight coefficient
    c1=2*rand(1);
    c2=2*rand(1);
    % Updating velocity
    vold=vnew;
    for i=1:n
       for j=1:dim
       vnew(i,j)=w*vnew(i,j)+c1*r1(i,j)*(pbest(i,j)-x(i,j))+c2*r2(i,j)*(gbest(j)-
x(i,j));
      if abs(vnew(i,j))==abs(vold(i,j))
         vnew(i,j)=rand(1,1).*vnew(i,j);
      end
       end
    end
    % Updating particles' coordinate
    for i=1:n
       for k=1:dim
       sig(i,k)=length(nonzeros(ta(:,k)))/(1+exp(-vnew(i,k)));
       x(i,k)=ta(ceil(sig(i,k)),k);
       end
    end
    % Calculating fitness function for each particle
       y=x';
        for k=1:n
          hop=loadcase(case33) ; matran=matrix;
           for i=1:dim
              hop.branch(y(i,k),11)=0;
              matran(x(k,i),:)=0;
           end
               % Check on constraint of radial distribution network
           for j=1:length(matrix(1,:))
              for i=1:length(matrix(1,:))
                 if sum(matran(:,i))==1
                    row=find(matran(:,i));
                    matran(row,:)=0;
                 end
              end
           end
           if sum(sum(matran))==0
              result=runpf(hop);
              fitness(k)=sum(result.branch(:,14)+result.branch(:,16))*1e3;
           end
        end
      % Updating pbest
        k=1:n
        fitness(k)<fpbest(k)
         pbest(k,:)=x(k,:);
         fpbest(k)=fitness(k);
```

```
            end
        end
    % Calculating fitness function for gbest
        u=gbest';
        hop=loadcase(case33);
        for i=1:length(u)
            hop.branch(u(i),11)=0;
        end
        result=runpf(hop);
        fgbest=sum(result.branch(:,14)+result.branch(:,16))*1e3;
        gbestvolt=result.bus(:,8);
        minvolt=min(gbestvolt);
    % Updating gbest
     for k=1:n
       if fpbest(k)<fgbest
          gbest=pbest(k,:);
       end
     end
end
% Calculating initial configuration
bandau=loadcase(case33);
o=[33 34 35 36 37];
for i=1:length(o)
   bandau.branch(o(i),11)=0;
end
ketqua=runpf(bandau);
tonthat=sum(ketqua.branch(:,14)+ketqua.branch(:,16))*1e3;
dienap=ketqua.bus(:,8);
dienapmin=min(dienap);
gbestvolt;
a=sort(gbest);
ploss=(tonthat-fgbest)*100/tonthat;
plot(dienap,'-sr')
hold on
plot(gbestvolt,'-^b')
ylabel('Voltage (p.u)')
xlabel('Node')
title('Voltage profile')
legend('Before Reconfig','After Reconfig')
hold off
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('=================================================================
==============================')
disp('**************** SIMULATION RESULTS OF 33 BUS
DISTRIBUTION NETWORK ********************')
```

```
disp('==========================================================
=======================================')
disp('                    BEFORE RECONFIGURATION            AFTER
RECONFIGURATION'         )
disp('-------------------------------------------------------------------------------------------')
disp(['Tie switches:              ', num2str(o), '                ',num2str(a)])
disp('-------------------------------------------------------------------------------------------')
disp(['Power loss:                ',num2str(tonthat),' kW','
',num2str(fgbest),' kW'])
disp('-------------------------------------------------------------------------------------------')
disp(['Power loss reduction:      ', '________','                        ',num2str(ploss), '
%'])
disp('-------------------------------------------------------------------------------------------')
disp(['Minimum voltage:           ',num2str(dienapmin),' pu','
',num2str(minvolt),' pu'])
disp('-------------------------------------------------------------------------------------------')
toc
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
disp('      ')
```

DAFTAR RIWAYAT HIDUP

Sahabuddin, atau akrab dipanggil Budi, lahir di Sungguminasa-Gowa pada tanggal 3 April 1975, saya merupakan anak ke-dua dari bapak Abdul Rifai dan ibu Hj. Sitti Budiyati. Pertama kali menempuh pendidikan pada SD Inpres Sungguminasa pada tahun 1981-1987, kemudian melanjutkan Pendidikan pada Sekolah Teknik (ST) Negeri 3 Ujung Pandang pada tahun 1987-1990, dan pada tahun yang sama 1990 melanjutkan Pendidikan pada Sekolah Menengah Teknologi Industri (SMTI) Ujung Pandang pada tahun 1990-1993, selanjutnya melanjutkan ke perguruan tinggi pada tahun 1995 STMIK Dipanegara pada program studi Manajemen Informatika dan selesai pada tahun 2003, pada tahun 2004 sudah mulai mengajar dengan mata pelajaran TIK pada SMP Negeri 1 Barombong, pada tahun 2005 melanjutkan kuliah S1 pada Universitas Negeri Makassar program studi Administrasi Pendidikan dan selesai pada tahun 2008, selanjutnya pada tahun 2009 melanjutkan ke jenjang S2 Program Pascasarjana Universitas Negeri Makassar program studi Administrasi pendidkan dan selesai pada tahun 2012, saya memulai karier sebagai dosen pada tahun 2014 sampai sekarang, pada tahun 2019 saya melanjutkan Pendidikan S2 Teknik Elektro peminatan Teknik Informatika pada Universitas Hasanuddin dan selesai pada tahun 2021, selanjutnya pada tahun 2022 melanjutkan Pendidikan Program Doktor (S3) Teknik Elektro Universitas Hasanuddin dan selesai pada akhir tahun 2023.