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LAMPIRAN

Lampiran 1.1 Hasil simulasi *harmonic load flow*

Project:	ETAP	Page:	14
Location:	19.0.1C	Date:	23-08-2023
Contract:		SN:	
Engineer:	Study Case: HA	Revision:	Base
Filename:	skripsiuasy	Config.:	Normal

System Harmonics Bus Information

Bus		Voltage Distortion								
ID	kV	Fund. %	RMS %	ASUM %	THD %	TIF	THHD %	TSHD %	THDG %	THDS %
Bus DP	0.400	98.14	98.17	103.60	2.29	88.27	0.00	0.00	2.29	2.29
Bus MDF EMG	0.400	96.63	96.66	101.97	2.27	87.42	0.00	0.00	2.27	2.27
Bus PP Chiller	0.400	98.01	98.05	104.68	2.78	110.39	0.00	0.00	2.78	2.78
Bus PP CHWP	0.400	98.01	98.05	104.68	2.78	110.39	0.00	0.00	2.78	2.78
Bus PP-VAC	0.400	98.01	98.05	104.68	2.78	110.39	0.00	0.00	2.78	2.78
Bus PUTR 1	0.400	98.14	98.17	103.60	2.29	88.27	0.00	0.00	2.29	2.29
Bus PUTR 2	0.400	98.01	98.05	104.68	2.78	110.39	0.00	0.00	2.78	2.78
Bus SDP EMG PARKIR	0.400	97.99	98.01	103.44	2.29	88.27	0.00	0.00	2.29	2.29
Bus SDP PARKIR	0.400	98.14	98.17	103.60	2.29	88.27	0.00	0.00	2.29	2.29
Bus SDP Pompa PL	0.400	98.01	98.05	104.68	2.78	110.39	0.00	0.00	2.78	2.78
Bus17	20.000	100.00	100.01	102.46	1.16	28.95	0.00	0.00	1.16	1.16
Bus18	20.000	100.00	100.01	102.45	1.18	28.17	0.00	0.00	1.18	1.18
Bus94	20.000	99.99	100.00	102.46	1.17	28.99	0.00	0.00	1.17	1.17
Bus95	20.000	99.99	100.00	102.46	1.17	29.00	0.00	0.00	1.17	1.17
Bus102	20.000	99.99	100.00	102.44	1.18	28.21	0.00	0.00	1.18	1.18
Bus103	20.000	99.99	100.00	102.44	1.18	28.21	0.00	0.00	1.18	1.18

* Indicates THD (Total Harmonic Distortion) Exceeds the Limit.
# Indicates IHD (Individual Harmonic Distortion) Exceeds the Limit.

Lampiran 1.2 Hasil simulasi *load flow analysis*

Project:		ETAP		Page:	10
Location:		19.0.1C		Date:	23-08-2023
Contract:				SN:	
Engineer:			Study Case: LF	Revision:	Base
Filename:	skripsiuuy			Config.:	Normal

LOAD FLOW REPORT

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
Bus DP	0.400	98.804	-2.8	0.000	0.000	1.363	0.686	Bus PUTR 1	-1.363	-0.686	2232.8	89.1	
								VFD61	0.007	0.007	14.3	71.3	
								VFD62	0.007	0.002	10.7	95.0	
								VFD63	0.015	0.005	23.7	95.0	
								VFD64	0.015	0.005	23.7	95.0	
								VFD65	0.015	0.005	23.7	95.0	
								VFD66	0.150	0.049	231.1	95.0	
								VFD67	0.076	0.025	117.1	95.0	
								VFD68	0.056	0.019	88.4	95.0	
								VFD69	0.068	0.022	104.0	95.0	
								VFD70	0.056	0.019	88.4	95.0	
								VFD71	0.056	0.019	88.4	95.0	
Bus MDP EMG	0.400	97.400	-3.0	0.000	0.000	0.431	0.247	Bus PUTR 1	-0.431	-0.247	736.7	86.6	
								VFD58	0.010	0.003	16.3	95.0	
								VFD59	0.028	0.009	43.5	95.0	
								VFD60	0.028	0.009	43.5	95.0	
Bus PP Chiller	0.400	98.760	-2.8	0.000	0.000	1.040	0.344	Bus PUTR 2	-1.040	-0.344	1609.3	95.0	
								VFD72	0.340	0.112	523.0	95.0	
								VFD73	0.340	0.112	523.0	95.0	
								VFD74	0.183	0.060	281.6	95.0	
								VFD75	0.183	0.060	281.6	95.0	
Bus PP CHWP	0.400	98.760	-2.8	0.000	0.000	0.442	0.274	Bus PUTR 2	-0.442	-0.274	759.9	85.0	
Bus PP VAC	0.400	98.760	-2.8	0.000	0.000	0.329	0.204	Bus PUTR 2	-0.329	-0.204	565.0	85.0	
Bus PUTR 1	0.400	98.804	-2.8	0.000	0.000	0.001	-1.001	Bus SDP EMG PARKIR	0.026	0.012	42.4	90.7	
								Bus MDP EMG	0.437	0.252	736.7	86.6	
								Bus102	-1.987	-0.057	2901.4	100.0	
								Bus DP	1.363	0.686	2232.8	89.1	
								Bus SDP PARKIR	0.160	0.000	274.5	85.2	
Bus PUTR 2	0.400	98.760	-2.8	0.000	0.000	0.001	-0.789	Bus95	-1.957	-0.118	2865.9	99.8	
								Bus PP Chiller	1.040	0.344	1609.3	95.0	
								Bus PP CHWP	0.442	0.274	759.9	85.0	

Lampiran 1.3 Lanjutan hasil simulasi *load flow analysis*

Project:		ETAP		Page:	11		
Location:		19.0.1C		Date:	23-08-2023		
Contract:				SN:			
Engineer:		Study Case: LF		Revision:	Base		
Filename:	skripsiasoy			Config.:	Normal		

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
								Bus SDP Pompa PL	0.140	0.087	240.7	85.0	
								Bus PP-VAC	0.329	0.204	565.0	85.0	
Bus SDP EMG PARKIR	0.400	98.748	-2.8	0.000	0.000	0.026	0.012	Bus PUTR 1	-0.026	-0.012	42.4	90.7	
								VFD56	0.007	0.002	10.9	95.0	
								VFD57	0.007	0.002	10.9	95.0	
Bus SDP PARKIR	0.400	98.904	-2.8	0.000	0.000	0.160	0.099	Bus PUTR 1	-0.160	-0.099	274.5	85.2	
Bus SDP Pompa PL	0.400	98.766	-2.8	0.000	0.000	0.140	0.087	Bus PUTR 2	-0.140	-0.087	240.7	85.0	
* Bus17	20.000	100.000	0.0	1.974	0.216	0.000	0.000	Bus94	1.974	0.216	57.3	99.4	
* Bus18	20.000	100.000	0.0	2.004	0.157	0.000	0.000	Bus103	2.004	0.157	58.0	99.7	
Bus94	20.000	99.995	0.0	0.000	0.000	0.000	0.000	Bus17	-1.974	-0.216	57.3	99.4	
								Bus95	1.974	0.216	57.3	99.4	
Bus95	20.000	99.995	0.0	0.000	0.000	0.000	0.000	Bus94	-1.974	-0.216	57.3	99.4	
								Bus PUTR 2	1.974	0.216	57.3	99.4	
Bus102	20.000	99.995	0.0	0.000	0.000	0.000	0.000	Bus103	-2.004	-0.157	58.0	99.7	
								Bus PUTR 1	2.004	0.157	58.0	99.7	
Bus103	20.000	99.995	0.0	0.000	0.000	0.000	0.000	Bus18	-2.004	-0.157	58.0	99.7	
								Bus102	2.004	0.157	58.0	99.7	
* VFD56	0.400	100.000	0.0	0.007	0.004	0.000	0.000	PP-LIFT-T-PUL54)-	0.007	0.004	11.7	85.0	
* VFD57	0.400	100.000	0.0	0.007	0.004	0.000	0.000	PP-LIFT-T-PUL55)-	0.007	0.004	11.7	85.0	
* VFD58	0.400	100.000	0.0	0.010	0.006	0.000	0.000	Lift(LS-03)-	0.010	0.006	17.3	85.0	
* VFD59	0.400	100.000	0.0	0.027	0.017	0.000	0.000	Lift(LS-02)-	0.027	0.017	46.2	85.0	
* VFD60	0.400	100.000	0.0	0.027	0.017	0.000	0.000	Lift(LS-01)-	0.027	0.017	46.2	85.0	
* VFD61	0.400	100.000	0.0	0.007	0.004	0.000	0.000	Lift(P-01)-	0.007	0.004	11.5	85.0	
* VFD62	0.400	100.000	0.0	0.007	0.004	0.000	0.000	Lift(P-02)-	0.007	0.004	11.5	85.0	
* VFD63	0.400	100.000	0.0	0.015	0.009	0.000	0.000	Lift(LZ-03)-	0.015	0.009	25.5	85.0	
* VFD64	0.400	100.000	0.0	0.015	0.009	0.000	0.000	Lift(LZ-02)-	0.015	0.009	25.5	85.0	
* VFD65	0.400	100.000	0.0	0.015	0.009	0.000	0.000	Lift(LZ-01)-	0.015	0.009	25.5	85.0	
* VFD66	0.400	100.000	0.0	0.015	0.009	0.000	0.000	Lift(LZ-04)-	0.015	0.009	25.5	85.0	
* VFD67	0.400	100.000	0.0	0.074	0.048	0.000	0.000	Lift(HZ-04)-	0.074	0.048	126.2	85.0	
* VFD68	0.400	100.000	0.0	0.056	0.035	0.000	0.000	Lift(HZ-05)-	0.056	0.035	95.3	85.0	
* VFD69	0.400	100.000	0.0	0.066	0.000	0.000	0.000	Lift(HZ-03)-	0.066	0.000	95.3	100.0	
* VFD70	0.400	100.000	0.0	0.056	0.035	0.000	0.000	Lift(HZ-02)-	0.056	0.035	95.3	85.0	
* VFD71	0.400	100.000	0.0	0.056	0.035	0.000	0.000	Lift(HZ-01)-	0.056	0.035	95.3	85.0	

Lampiran 1.4 Lanjutan hasil simulasi *load flow analysis*

Project:		ETAP		Page:	12
Location:		19.0.1C		Date:	23-08-2023
Contract:				SN:	
Engineer:		Study Case: LF		Revision:	Base
Filename:	skripsinovy			Config.:	Normal

Bus		Voltage		Generation		Load		Load Flow					XFMR
ID	kV	% Mag.	Ang.	MW	Mvar	MW	Mvar	ID	MW	Mvar	Amp	%PF	%Tap
* VFD72	0.480	100.000	0.0	0.332	0.205	0.000	0.000	PC-CHILLER 1-	0.332	0.205	562.9	85.0	
* VFD73	0.480	100.000	0.0	0.332	0.205	0.000	0.000	PC-CHILLER 2-	0.332	0.205	562.9	85.0	
* VFD74	0.480	100.000	0.0	0.179	0.111	0.000	0.000	PC-CHILLER 3-	0.179	0.111	303.1	85.0	
* VFD75	0.480	100.000	0.0	0.179	0.111	0.000	0.000	PP CHILLER 4-	0.179	0.111	303.1	85.0	

* Indicates a voltage regulated bus (voltage controlled or swing type machine connected to it)

# Indicates a bus with a load mismatch of more than 0.1 MVA

Skripsi Ahmad Aminul Kasbi

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