LAMPIRAN A : Data Waktu Antar Kerusakan dan Waktu Perbaikan

a. Cane Cutter 1

PISAU		TANGKAI PISAU		BAUT PISAU		*DISK ROTOR*	
Tr	Tf	Tr	Tf	Tr	Tf	Tr	Tf
0,50		1,25		0,75		0,75	
0,25	24,00	1,50	1368,00	0,25	1920,00	0,50	1296,00
0,50	216,00	1,75	240,00	0,16	312,00	1,25	696,00
0,25	240,00	1,25	960,00	0,33	912,00	0,75	1920,00
0,75	360,00	1,75	720,00	0,25	960,00	0,50	312,00
0,50	120,00						
0,50	72,00						
0,25	480,00						
0,25	240,00						
0,50	480,00						
0,25	336,00						
0,50	456,00						
0,25	384,00						
0,75	240,00						
0,25	312,00						

Sumber : PG.Kebon Agung

Keterangan :

Tr = *Time to Repair* (jam)

Tf = *Time to Failure* (jam)

b. Intermediate Carrier 1

BAUT *IMC 1*		PEN *IMC 1*		*RAKE IMC 1*		REL *IMC 1*	
Tr	Tf	Tr	Tf	Tr	Tf	Tr	Tf
0,50		0,25		0,50		0,50	
0,75	360,00	0,50	456,00	0,75	720,00	1,00	912,00
0,33	1680,00	0,16	1704,00	0,25	1824,00	1,00	1800,00
0,50	936,00	0,50	912,00	1,00	912,00	0,75	432.00
				0,50	648,00		

Sumber : PG.Kebon Agung

Keterangan :

Tr = *Time to Repair* (jam)

Tf = *Time to Failure* (jam)

LAMPIRAN B : Distribusi yang Mendasari Data

Uji Distribusi Lama Waktu Perbaikan *Cane Cutter* dengan menggunakan *software Minitab 14*

Distribution ID Plot: Tr Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.115
Lognormal	2.378
Exponential	3.474

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.0796410	0.0319412	0.0362870	0.174793
Lognormal	1	0.144902	0.0300049	0.0965639	0.217436
Exponential	1	0.0041876	0.0010812	0.0025246	0.0069462
Weibull	5	0.149535	0.0420945	0.0861245	0.259632
Lognormal	5	0.192474	0.0317564	0.139294	0.265958
Exponential	5	0.0213722	0.0055183	0.0128846	0.0354510
Weibull	10	0.197503	0.0455491	0.125680	0.310371
Lognormal	10	0.223925	0.0325049	0.168478	0.297621
Exponential	10	0.0439002	0.0113350	0.0264659	0.0728192
Weibull	50	0.409071	0.0483169	0.324534	0.515629
Lognormal	50	0.381916	0.0410806	0.309321	0.471549
Exponential	50	0.288811	0.0745708	0.174114	0.479064

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.418577	0.045130	0.338845	0.517069
Lognormal	0.416538	0.046708	0.334353	0.518924
Exponential	0.416667	0.107583	0.251194	0.691143

Distribution ID Plot: Tr Tangkai Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.524
Lognormal	2.517
Exponential	3.552

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.871476	0.229335	0.520302	1.45967
Lognormal	1	1.09159	0.149360	0.834821	1.42734
Exponential	1	0.0160805	0.0071914	0.0066932	0.0386340
Weibull	5	1.10678	0.204470	0.770560	1.58970
Lognormal	5	1.21646	0.132621	0.982426	1.50626
Exponential	5	0.0820693	0.0367025	0.0341595	0.197174
Weibull	10	1.22999	0.186195	0.914218	1.65484
Lognormal	10	1.28877	0.123617	1.06790	1.55533
Exponential	10	0.168577	0.0753898	0.0701664	0.405011
Weibull	50	1.62135	0.125828	1.39258	1.88772
Lognormal	50	1.57991	0.112294	1.37446	1.81607
Exponential	50	1.10904	0.495976	0.461611	2.66449

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1.59823	0.123705	1.37327	1.86005
Lognormal	1.59999	0.114437	1.39071	1.84076
Exponential	1.60000	0.715542	0.66596	3.84405

Distribution ID Plot: Tr Baut Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.680
Lognormal	2.631
Exponential	2.883

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.0320719	0.0301870	0.0050693	0.202909
Lognormal	1	0.0915222	0.0403349	0.0385827	0.217101
Exponential	1	0.0034975	0.0015641	0.0014558	0.0084029
Weibull	5	0.0781085	0.0519420	0.0212154	0.287571
Lognormal	5	0.129728	0.0455543	0.0651830	0.258188
Exponential	5	0.0178501	0.0079828	0.0074297	0.0428853
Weibull	10	0.115723	0.0633831	0.0395552	0.338559
Lognormal	10	0.156244	0.0482709	0.0852763	0.286272
Exponential	10	0.0366655	0.0163973	0.0152612	0.0880899
Weibull	50	0.323750	0.0935676	0.183740	0.570450
Lognormal	50	0.301103	0.0689318	0.192242	0.471608
Exponential	50	0.241215	0.107875	0.100400	0.579527

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.351428	0.089803	0.212972	0.579897
Lognormal	0.343256	0.083572	0.212999	0.553169
Exponential	0.348000	0.155630	0.144847	0.836081

Distribution ID Plot: Tr Disk Rotor

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.631
Lognormal	2.634
Exponential	3.136

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.172632	0.103915	0.0530573	0.561691
Lognormal	1	0.321627	0.0936331	0.181781	0.569059
Exponential	1	0.0075378	0.0033710	0.0031374	0.0181097
Weibull	5	0.302792	0.128510	0.131789	0.695681
Lognormal	5	0.404982	0.0939404	0.257033	0.638090
Exponential	5	0.0384700	0.0172043	0.0160123	0.0924253
Weibull	10	0.388071	0.135433	0.195817	0.769081
Lognormal	10	0.457919	0.0934530	0.306955	0.683131
Exponential	10	0.0790204	0.0353390	0.0328905	0.189849
Weibull	50	0.742928	0.135561	0.519552	1.06234
Lognormal	50	0.706309	0.106812	0.525134	0.949989
Exponential	50	0.519860	0.232489	0.216380	1.24898

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.751687	0.127076	0.539682	1.04698
Lognormal	0.747867	0.116285	0.551407	1.01433
Exponential	0.750000	0.335410	0.312171	1.80190

Uji Distribusi Waktu Antar Kerusakan *Cane Cutter* dengan Menggunakan *Software Minitab 14*

Distribution ID Plot: Tf Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	1.334
Lognormal	1.779
Exponential	2.434

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	31.8201	18.4243	10.2292	98.9827
Lognormal	1	34.6021	14.3824	15.3215	78.1458
Exponential	1	2.84281	0.759773	1.68366	4.80000
Weibull	5	71.7606	28.7195	32.7510	157.234
Lognormal	5	60.0079	19.8736	31.3548	114.845
Exponential	5	14.5087	3.87761	8.59280	24.4975
Weibull	10	102.769	33.2847	54.4721	193.887
Lognormal	10	80.4776	23.4494	45.4625	142.461
Exponential	10	29.8020	7.96491	17.6503	50.3197
Weibull	50	263.064	40.9153	193.942	356.822
Lognormal	50	226.628	48.9319	148.432	346.018
Exponential	50	196.062	52.3997	116.118	331.044

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	279.903	38.5290	213.717	366.586
Lognormal	314.077	78.0983	192.920	511.323
Exponential	282.857	75.5968	167.523	477.596

Distribution ID Plot: Tf Tangkai Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.966
Lognormal	3.035
Exponential	3.207

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	106.462	107.790	14.6343	774.486
Lognormal	1	151.840	95.1265	44.4749	518.390
Exponential	1	8.26138	4.13069	3.10064	22.0117
Weibull	5	229.247	161.049	57.8530	908.410
Lognormal	5	236.605	118.108	88.9452	629.398
Exponential	5	42.1631	21.0815	15.8246	112.340
Weibull	10	321.672	183.412	105.214	983.453
Lognormal	10	299.722	131.632	126.732	708.843
Exponential	10	86.6063	43.3032	32.5049	230.755
Weibull	50	780.573	216.254	453.515	1343.49
Lognormal	50	690.200	224.616	364.723	1306.13
Exponential	50	569.767	284.883	213.844	1518.09

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	821.435	202.113	507.150	1330.49
Lognormal	853.034	305.598	422.693	1721.50
Exponential	822.000	411.000	308.511	2190.14

Distribution ID Plot: Tf Baut Pisau

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.009
Lognormal	3.035
Exponential	3.179

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	99.3109	109.228	11.5025	857.438
Lognormal	1	187.746	117.401	55.1187	639.506
Exponential	1	10.3116	5.15582	3.87014	27.4744
Weibull	5	237.187	182.288	52.5907	1069.73
Lognormal	5	292.314	145.644	110.089	776.168
Exponential	5	52.6269	26.3135	19.7518	140.220
Weibull	10	348.391	218.577	101.867	1191.52
Lognormal	10	370.128	162.249	156.755	873.944
Exponential	10	108.100	54.0499	40.5718	288.022
Weibull	50	952.920	300.383	513.733	1767.57
Lognormal	50	851.002	276.429	450.233	1608.51
Exponential	50	711.169	355.585	266.914	1894.84

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1028.95	285.470	597.365	1772.35
Lognormal	1050.94	375.670	521.562	2117.63
Exponential	1026.00	513.000	385.076	2733.68

Distribution ID Plot: Tf Disk Rotor

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.927
Lognormal	2.953
Exponential	3.081

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	92.7926	108.407	9.39901	916.102
Lognormal	1	173.548	114.705	47.5145	633.889
Exponential	1	10.6132	5.30658	3.98331	28.2778
Weibull	5	229.202	186.617	46.4694	1130.50
Lognormal	5	277.109	145.933	98.7155	777.885
Exponential	5	54.1657	27.0829	20.3294	144.320
Weibull	10	341.702	226.608	93.1433	1253.55
Lognormal	10	355.625	164.771	143.418	881.817
Exponential	10	111.261	55.6304	41.7581	296.444
Weibull	50	971.685	318.935	510.665	1848.91
Lognormal	50	857.368	294.361	437.445	1680.39
Exponential	50	731.963	365.982	274.719	1950.25

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1058.87	303.666	603.575	1857.60
Lognormal	1085.31	414.220	513.668	2293.11
Exponential	1056.00	528.000	396.336	2813.62

Uji Distribusi Lama waktu Perbaikan *Intermediate Carrier 2* dengan Menggunakan *Software Minitab 14*

Distribution ID Plot: Tr Baut IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.043
Lognormal	3.040
Exponential	3.512

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.170692	0.0907241	0.0602270	0.483764
Lognormal	1	0.253870	0.0709309	0.146821	0.438971
Exponential	1	0.0052262	0.0026131	0.0019615	0.0139247
Weibull	5	0.262683	0.0979815	0.126454	0.545673
Lognormal	5	0.309402	0.0688791	0.199999	0.478650
Exponential	5	0.0266725	0.0133363	0.0100107	0.0710665
Weibull	10	0.317771	0.0970959	0.174593	0.578364
Lognormal	10	0.343813	0.0673401	0.234209	0.504709
Exponential	10	0.0547875	0.0273937	0.0205627	0.145976
Weibull	50	0.522995	0.0818145	0.384893	0.710648
Lognormal	50	0.498745	0.0723857	0.375266	0.662855
Exponential	50	0.360437	0.180218	0.135278	0.960350

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.520644	0.077338	0.389136	0.69659
Lognormal	0.520206	0.077074	0.389099	0.69549
Exponential	0.520000	0.260000	0.195165	1.38549

Distribution ID Plot: Tr Pen IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.158
Lognormal	3.117
Exponential	3.316

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.0690389	0.0569610	0.0137026	0.347843
Lognormal	1	0.102434	0.0477757	0.0410620	0.255534
Exponential	1	0.0035427	0.0017714	0.0013297	0.0094393
Weibull	5	0.128537	0.0736774	0.0417948	0.395309
Lognormal	5	0.142514	0.0529616	0.0687909	0.295246
Exponential	5	0.0180809	0.0090404	0.0067861	0.0481749
Weibull	10	0.169137	0.0787517	0.0679069	0.421275
Lognormal	10	0.169946	0.0555650	0.0895374	0.322565
Exponential	10	0.0371396	0.0185698	0.0139391	0.0989550
Weibull	50	0.346916	0.0784847	0.222665	0.540500
Lognormal	50	0.316228	0.0766149	0.196686	0.508425
Exponential	50	0.244334	0.122167	0.0917031	0.651007

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.354446	0.072726	0.237082	0.529910
Lognormal	0.355619	0.091076	0.215272	0.587464
Exponential	0.352500	0.176250	0.132300	0.939204

Distribution ID Plot: Tr Rake IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	2.506
Lognormal	2.532
Exponential	2.998

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.113093	0.0809323	0.0278159	0.459809
Lognormal	1	0.182785	0.0735556	0.0830620	0.402233
Exponential	1	0.0060302	0.0026968	0.0025099	0.0144877
Weibull	5	0.213324	0.106725	0.0800185	0.568710
Lognormal	5	0.251353	0.0805934	0.134077	0.471207
Exponential	5	0.0307760	0.0137634	0.0128098	0.0739402
Weibull	10	0.282329	0.115349	0.126761	0.628817
Lognormal	10	0.297875	0.0840305	0.171360	0.517795
Exponential	10	0.0632163	0.0282712	0.0263124	0.151879
Weibull	50	0.587884	0.120899	0.392862	0.879716
Lognormal	50	0.542236	0.113348	0.359960	0.816812
Exponential	50	0.415888	0.185991	0.173104	0.999184

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.602042	0.112715	0.417122	0.86894
Lognormal	0.604828	0.133159	0.392854	0.93118
Exponential	0.600000	0.268328	0.249737	1.44152

Distribution ID Plot: Tr Rel IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.136
Lognormal	3.116
Exponential	3.569

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	0.348524	0.156465	0.144577	0.840169
Lognormal	1	0.404147	0.110493	0.236496	0.690647
Exponential	1	0.0081659	0.0040829	0.0030648	0.0217573
Weibull	5	0.486121	0.151091	0.264351	0.893936
Lognormal	5	0.490463	0.106842	0.320023	0.751675
Exponential	5	0.0416758	0.0208379	0.0156417	0.111041
Weibull	10	0.563072	0.141765	0.343760	0.922299
Lognormal	10	0.543778	0.104218	0.373494	0.791697
Exponential	10	0.0856054	0.0428027	0.0321292	0.228088
Weibull	50	0.827151	0.0997314	0.653061	1.04765
Lognormal	50	0.782542	0.111135	0.592409	1.03370
Exponential	50	0.563182	0.281591	0.211372	1.50055

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	0.817498	0.095530	0.650157	1.02791
Lognormal	0.814754	0.118021	0.613375	1.08225
Exponential	0.812500	0.406250	0.304946	2.16483

Uji Distribusi Waktu Antar Kerusakan *Intermediate Carrier 2* dengan Menggunakan *Software Minitab 14*

Distribution ID Plot: Tf Baut IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.650
Lognormal	3.671
Exponential	3.738

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	105.021	131.909	8.95667	1231.42
Lognormal	1	188.867	133.280	47.3673	753.066
Exponential	1	9.96993	5.75614	3.21552	30.9125
Weibull	5	243.142	212.787	43.7448	1351.43
Lognormal	5	291.121	163.690	96.7082	876.360
Exponential	5	50.8829	29.3773	16.4108	157.766
Weibull	10	352.264	251.046	87.1463	1423.93
Lognormal	10	366.649	181.379	139.049	966.796
Exponential	10	104.518	60.3433	33.7092	324.064
Weibull	50	929.488	327.273	466.160	1853.33
Lognormal	50	827.236	303.241	403.276	1696.90
Exponential	50	687.602	396.987	221.766	2131.96

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	995.53	308.420	542.434	1827.09
Lognormal	1011.97	406.629	460.401	2224.32
Exponential	992.00	572.731	319.941	3075.76

Distribution ID Plot: Tf Pen IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.644
Lognormal	3.654
Exponential	3.759

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	136.704	152.348	15.3874	1214.49
Lognormal	1	254.787	152.468	78.8512	823.281
Exponential	1	10.2915	5.94183	3.31924	31.9096
Weibull	5	291.885	227.335	63.4237	1343.29
Lognormal	5	367.731	175.336	144.435	936.242
Exponential	5	52.5243	30.3249	16.9402	162.855
Weibull	10	408.034	259.428	117.355	1418.70
Lognormal	10	447.178	187.590	196.519	1017.55
Exponential	10	107.889	62.2898	34.7966	334.518
Weibull	50	980.492	312.329	525.169	1830.58
Lognormal	50	891.545	277.137	484.782	1639.61
Exponential	50	709.783	409.793	228.920	2200.73

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1029.82	292.307	590.413	1796.26
Lognormal	1030.60	342.794	536.991	1977.94
Exponential	1024.00	591.207	330.262	3174.98

Distribution ID Plot: Tf Rake IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.085
Lognormal	3.089
Exponential	3.297

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	163.908	136.582	32.0116	839.256
Lognormal	1	367.507	142.578	171.804	786.134
Exponential	1	10.3116	5.15582	3.87014	27.4744
Weibull	5	328.404	193.026	103.776	1039.25
Lognormal	5	483.680	149.515	263.897	886.504
Exponential	5	52.6269	26.3135	19.7518	140.220
Weibull	10	446.369	215.791	173.059	1151.32
Lognormal	10	559.954	152.288	328.591	954.222
Exponential	10	108.100	54.0499	40.5718	288.022
Weibull	50	996.585	251.964	607.166	1635.77
Lognormal	50	938.603	189.155	632.325	1393.23
Exponential	50	711.169	355.585	266.914	1894.84

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1032.48	236.364	659.202	1617.14
Lognormal	1018.02	213.330	675.128	1535.08
Exponential	1026.00	513.000	385.076	2733.68

Distribution ID Plot: Tf Rel IMC

Goodness-of-Fit

Distribution	Anderson-Darling (adj)
Weibull	3.644
Lognormal	3.654
Exponential	3.736

Table of Percentiles

Distribution	Percent	Percentile	Standard Error	95% Normal CI Lower	Upper
Weibull	1	116.781	141.028	10.9507	1245.39
Lognormal	1	229.827	148.880	64.5658	818.090
Exponential	1	10.5328	6.08109	3.39704	32.6575
Weibull	5	265.754	224.304	50.8209	1389.69
Lognormal	5	341.903	176.472	124.325	940.261
Exponential	5	53.7554	31.0357	17.3373	166.672
Weibull	10	382.109	263.289	99.0093	1474.69
Lognormal	10	422.534	191.877	173.509	1028.97
Exponential	10	110.418	63.7498	35.6121	342.358
Weibull	50	988.376	341.299	502.332	1944.70
Lognormal	50	891.765	300.078	461.128	1724.56
Exponential	50	726.418	419.398	234.285	2252.31

Table of MTTF

Distribution	Mean	Standard Error	95% Normal CI Lower	Upper
Weibull	1054.00	321.503	579.693	1916.39
Lognormal	1056.85	384.648	517.862	2156.82
Exponential	1048.00	605.063	338.002	3249.40

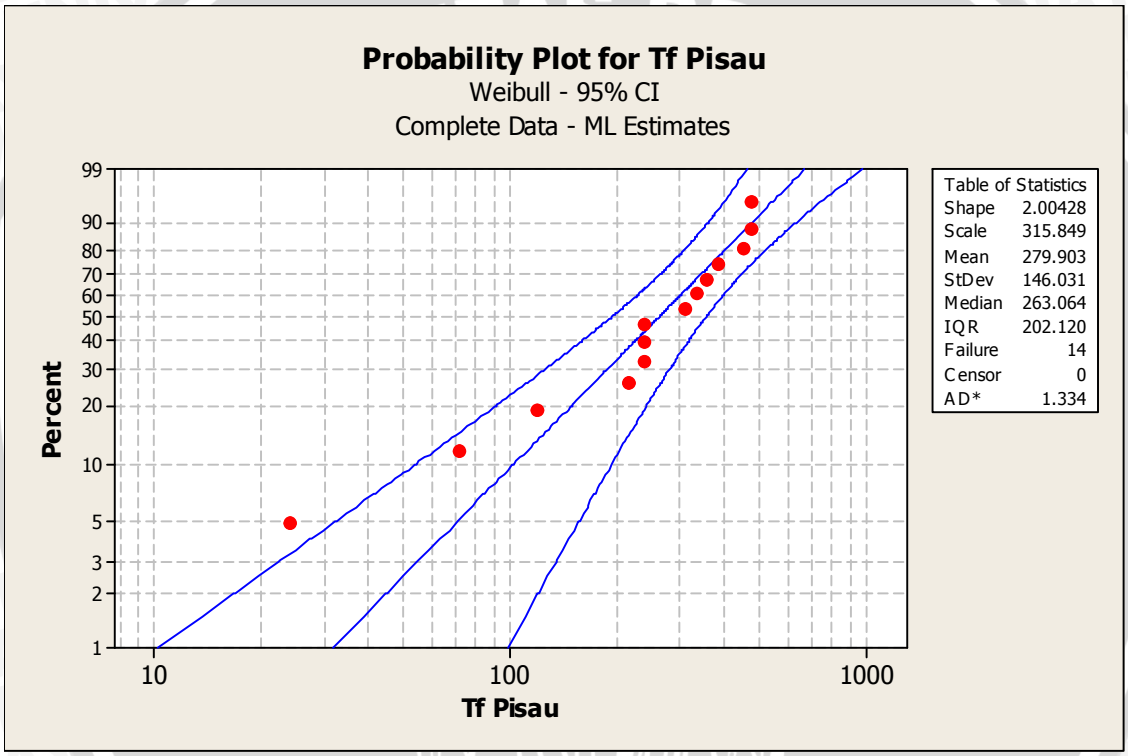
LAMPIRAN C : Perhitungan MTTF dan MTTR

Contoh perhitungan nilai parameter komponen, MTTF, dan MTTR dengan menggunakan *software Minitab 14*

Distribution Analysis: Tf Pisau

```
Variable: Tf Pisau

Censoring Information  Count
Uncensored value          14

Estimation Method: Maximum Likelihood

Distribution:   Weibull


Parameter Estimates

                     Standard   95.0% Normal CI
Parameter  Estimate     Error    Lower    Upper
Shape       2.00428  0.458670  1.27987  3.13871
Scale       315.849   43.8122  240.661  414.525

Log-Likelihood = -89.507

Goodness-of-Fit
Anderson-Darling (adjusted) = 1.334


Characteristics of Distribution

                                 Standard   95.0% Normal CI
                       Estimate     Error    Lower    Upper
Mean(MTTF)              279.903   38.5290  213.717  366.586
Standard Deviation      146.031   31.7567  95.3534  223.641
Median                  263.064   40.9153  193.942  356.822
First Quartile(Q1)      169.634   38.0636  109.273  263.337
Third Quartile(Q3)      371.754   49.5728  286.252  482.794
Interquartile Range(IQR)  202.120   40.5315  136.432  299.434


Table of Percentiles

                     Standard   95.0% Normal CI
Percent  Percentile     Error    Lower    Upper
      1     31.8201   18.4243  10.2292  98.9827
      2     45.0809   22.6203  16.8610  120.532
      3     55.3295   25.2717  22.6032  135.439
      4     64.0337   27.2068  27.8450  147.255
      5     71.7606   28.7195  32.7510  157.234
      6     78.8003   29.9510  37.4108  165.981
      7     85.3248   30.9811  41.8801  173.838
      8     91.4462   31.8596  46.1965  181.018
      9     97.2420   32.6197  50.3871  187.667
     10     102.769   33.2847  54.4721  193.887
     20     149.440   37.1081  91.8546  243.126
     30     188.840   38.7433  126.315  282.312
     40     225.905   39.7652  159.990  318.978
```

50	263.064	40.9153	193.942	356.822
60	302.368	42.8720	229.006	399.232
70	346.498	46.5787	266.242	450.947
80	400.493	53.7929	307.797	521.106
90	478.851	69.4446	360.376	636.274
91	489.660	72.0324	367.009	653.300
92	501.467	74.9651	374.107	672.187
93	514.524	78.3317	381.784	693.416
94	529.195	82.2621	390.210	717.684
95	546.037	86.9570	399.638	746.065
96	565.964	92.7501	410.482	780.340
97	590.660	100.263	423.495	823.811
98	623.803	110.881	440.298	883.788
99	676.696	128.964	465.772	983.138



Perhitungan nilai MTTF dengan menggunakan rumus :

- ✓ Perhitungan MTTF untuk data berdistribusi Weibull dirumuskan sebagai berikut :

  $MTTF = \beta\Gamma(1+\frac{1}{\alpha})$, dimana :

  α = parameter bentuk

  β = parameter skala

1. Perhitungan MTTF Cane Cutter
    - Pisau : α = 2,004 ; β = 315,849

      $MTTF = 315{,}849\Gamma(1 + \frac{1}{2{,}004})$

      MTTF = 157,293 (jam)
    - Tangkai Pisau : α = 2,125 ; β = 927,507

      $MTTF = 927{,}507\Gamma(1 + \frac{1}{2{,}125})$

      MTTF = 411,813 (jam)
    - Baut Pisau : α = 1,872 ; β = 1158,98

      $MTTF = 1158{,}98\Gamma(1 + \frac{1}{1{,}872})$

      MTTF = 650,188 (jam)
    - Disk Rotor : α = 1,806 ; β = 1190,78

      $MTTF = 1190{,}78\Gamma(1 + \frac{1}{1{,}806})$

      MTTF = 706,133 (jam)
2. Perhitungan MTTF Intermediate Carrier 1
    - Baut IMC 1 : α = 1,942; β = 1122,60

      $MTTF = 1122{,}60\Gamma(1 + \frac{1}{1{,}942})$

      MTTF = 591,610 (jam)
    - Pen IMC 1 : α = 1,749 ; β = 1162,84

      $MTTF = 1162{,}84\Gamma(1 + \frac{1}{1{,}749})$

      MTTF = 723,286 (jam)
    - Rake IMC 1 : α = 1,645 ; β = 1165,14

      $MTTF = 1165{,}14\Gamma(1 + \frac{1}{1{,}645})$

      MTTF = 513.474 (jam)
    - Rel IMC 1 : α = 1,982 ; β = 1189,11

      $MTTF = 1189{,}11\Gamma(1 + \frac{1}{1{,}982})$

      MTTF = 604,068 (jam)

Distribution Analysis: Tr Pisau

Variable: Tr Pisau

Censoring Information	Count
Uncensored value	15

Estimation Method: Maximum Likelihood

Distribution: Weibull

Parameter Estimates

Parameter	Estimate	Standard Error	95.0% Normal CI Lower	Upper
Shape	2.58723	0.514284	1.75241	3.81975
Scale	0.471327	0.0498488	0.383086	0.579892

Log-Likelihood = 5.534

Goodness-of-Fit
Anderson-Darling (adjusted) = 2.115

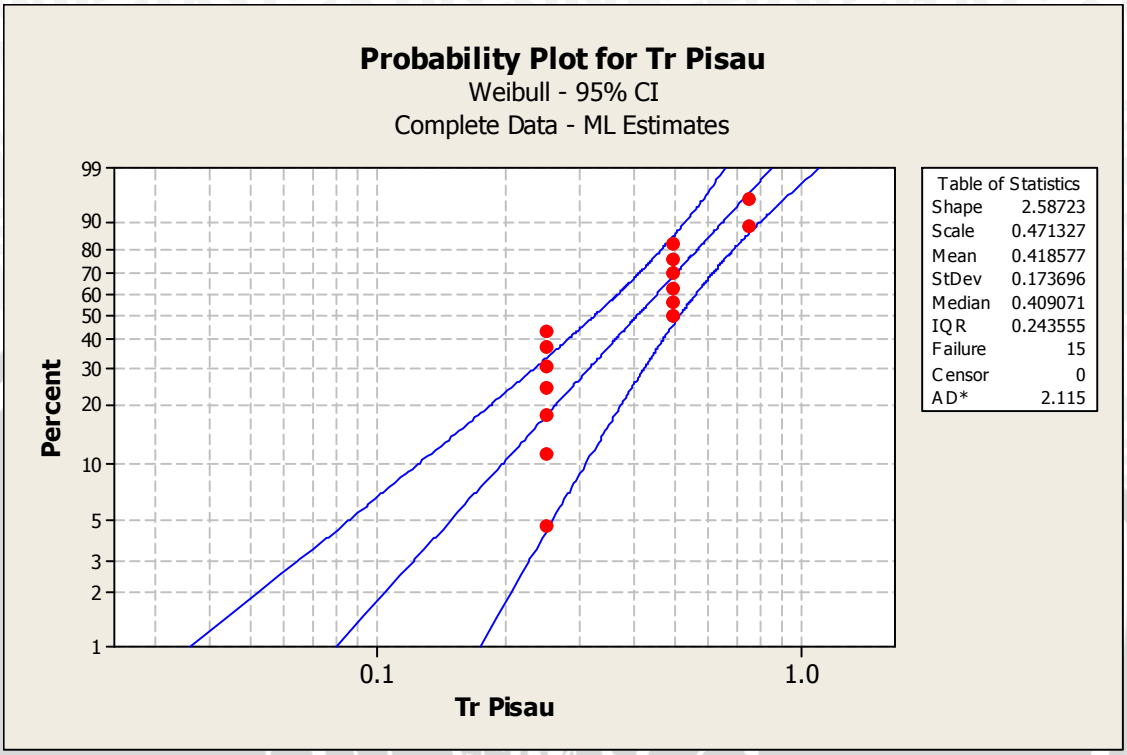
Characteristics of Distribution

	Estimate	Standard Error	95.0% Normal CI Lower	Upper
Mean(MTTF)	0.418577	0.0451295	0.338845	0.517069
Standard Deviation	0.173696	0.0294596	0.124573	0.242191
Median	0.409071	0.0483169	0.324534	0.515629
First Quartile(Q1)	0.291195	0.0478949	0.210951	0.401964
Third Quartile(Q3)	0.534750	0.0536298	0.439324	0.650905
Interquartile Range(IQR)	0.243555	0.0407964	0.175395	0.338203

Table of Percentiles

Percent	Percentile	Standard Error	95.0% Normal CI Lower	Upper
1	0.0796410	0.0319412	0.0362870	0.174793
2	0.104313	0.0364431	0.0525970	0.206879
3	0.122253	0.0390303	0.0653888	0.228566
4	0.136903	0.0407932	0.0763448	0.245498
5	0.149535	0.0420945	0.0861245	0.259632
6	0.160778	0.0431009	0.0950691	0.271903
7	0.170998	0.0439034	0.103382	0.282836
8	0.180427	0.0445569	0.111197	0.292757
9	0.189224	0.0450972	0.118607	0.301884
10	0.197503	0.0455491	0.125680	0.310371
20	0.263962	0.0476136	0.185353	0.375908
30	0.316424	0.0479951	0.235049	0.425970
40	0.363551	0.0480434	0.280594	0.471034
50	0.409071	0.0483169	0.324534	0.515629
60	0.455667	0.0492906	0.368613	0.563279
70	0.506386	0.0516174	0.414683	0.618368
80	0.566506	0.0565426	0.465850	0.688910
90	0.650614	0.0676266	0.530698	0.797627
91	0.661963	0.0694769	0.538884	0.813153
92	0.674295	0.0715759	0.547640	0.830241
93	0.687857	0.0739875	0.557110	0.849288
94	0.703002	0.0768039	0.567495	0.870867

95	0.720273	0.0801675	0.579104	0.895854
96	0.740554	0.0843144	0.592440	0.925697
97	0.765466	0.0896826	0.608413	0.963060
98	0.798534	0.0972418	0.628981	1.01379
99	0.850503	0.110026	0.660023	1.09595



Perhitungan nilai MTTR dengan menggunakan rumus :

- ✓ Perhitungan MTTR untuk data berdistribusi Weibull dirumuskan sebagai berikut :

  $MTTR = \beta\Gamma(1+\frac{1}{\alpha})$, dimana :

  α = parameter bentuk

  β = parameter skala

- ✓ Sedangkan untuk data yang berdistribusi Lognormal dirumuskan sebagai berikut: $MTTR = t_0 \exp(\frac{\sigma^2}{2})$, dimana :

  $t_0 = e^{\mu}$

1. Perhitungan MTTR Cane Cutter

- Pisau : α =2,587 ; β = 0,471

  $MTTR = 0{,}471\Gamma(1 + \frac{1}{2{,}587})$

  $MTTR$ = 0,129 (jam)

- Tangkai Pisau : μ = 0,457 ; σ = 0,158

  $MTTR = t_0 \exp(\frac{\sigma^2}{2})$

  $t_0 = e^{0{,}457}$

  $t_0 = 1{,}579$

  $MTTR = 1{,}579 \exp(\frac{0{,}158^2}{2})$

  $MTTR = 1{,}599$ (jam)

- Baut Pisau : μ = -1,2 ; σ = 0,512

  $MTTR = t_0 \exp(\frac{\sigma^2}{2})$

  $t_0 = e^{-1.2}$

  $t_0 = 0{,}301$

  $MTTR = 0{,}301 \exp(\frac{0{,}512^2}{2})$

  $MTTR = 0{,}343$ (jam)

- Disk Rotor : α = 2,901 ; β = 0,843

  $MTTR = 0{,}843\Gamma(1 + \frac{1}{2{,}901})$

  $MTTR$ = 0,158 (jam)

2. Perhitungan MTTR Intermediate Carrier 1

- Baut IMC 1 : μ = -0,696 ; σ = 0,294

  $MTTR = t_0 \exp(\frac{\sigma^2}{2})$

  $t_0 = e^{-0.696}$

  $t_0 = 0{,}499$

  $MTTR = 0{,}593 \exp(\frac{0{,}294^2}{2})$

  $MTTR = 0{,}521$ (jam)

- Pen IMC 1 : μ = -1,151 ; σ = 0,484

  $MTTR = t_0 \exp(\frac{\sigma^2}{2})$

  $t_0 = e^{-1{,}151}$

  $t_0 = 0{,}316$

  $MTTR = 0{,}316 \exp(\frac{0{,}484^2}{2})$

  $MTTR = 0{,}356$ (jam)

- Rake IMC 1 : α = 2,568 ; β = 0,678

  $MTTR = 0{,}678\Gamma(1 + \frac{1}{2{,}568})$

  $MTTR = 0{,}189$ (jam)

- Rel IMC 1 : μ = -0.245 ; σ = 0,284

  $MTTR = t_0 \exp(\frac{\sigma^2}{2})$

  $t_0 = e^{-0{,}245}$

  $t_0 = 0{,}783$

  $MTTR = 0{,}783 \exp(\frac{0{,}284^2}{2})$

  $MTTR = 0{,}815$ (jam)

Hasil Uji Distribusi

JENIS MESIN	NAMA KOMPONEN	KET	JENIS DISTRIBUSI	PARAMETER			
				α	β	μ	σ
CANE CUTTER	PISAU	Tf	WEIBULL	2,004	315,849		
		Tr	WEIBULL	2,587	0,471		
	TANGKAI PISAU	Tf	WEIBULL	2,125	927,507		
		Tr	LOGNORMAL			0,457	0,158
	BAUT PISAU	Tf	WEIBULL	1,872	1158,98		
		Tr	LOGNORMAL			-1,2	0,512
	DISK ROTOR	Tf	WEIBULL	1,806	1190,78		
		Tr	WEIBULL	2,901	0,843		
INTERMEDIATE CARRIER 1	BAUT *IMC 1*	Tf	WEIBULL	1,942	1160,60		
		Tr	LOGNORMAL			-0,696	0,294
	PEN *IMC 1*	Tf	WEIBULL	1,749	1162,84		
		Tr	LOGNORMAL			-1,151	0,484
	RAKE IMC 1	Tf	WEIBULL	1,645	1165,14		
		Tr	WEIBULL	2,568	0,678		
	REL *IMC 1*	Tf	WEIBULL	1,982	1189,11		
		Tr	LOGNORMAL			-0,245	0,284

Sumber : Pengolahan Data dengan *Software Minitab 14*

Hasil Perhitungan *MTTF* dan *MTTR*

JENIS MESIN	NAMA KOMPONEN	*MTTR* (jam)	*MTTF* (jam)
CANE CUTTER	PISAU	0,129	157,293
	TANGKAI PISAU	1,599	411,813
	BAUT PISAU	0,343	650,188
	DISK ROTOR	0,158	706,133
IMC 1	BAUT *IMC 1*	0,521	591,610
	PEN *IMC 1*	0,356	723,286
	RAKE IMC 1	0,189	787,635
	REL *IMC 1*	0,815	604,068

Sumber : Pengolahan Data dengan *Software Minitab 14*

Lampiran D : Perhitungan *MTTFm*

- Perhitungan MTTFm untuk data berdistribusi weibull dirumuskan sebagai berikut : $MTTFm = \int_0^{\infty} Rm(t)dt$

$$MTTFm = \frac{\int_0^{Tm} Rm(t)dt}{1-R(Tm)}$$

$$MTTFm = \frac{\int_0^{Tm} \exp\left[-\left(\frac{t}{\beta}\right)^{\alpha}\right] \mathrm{dt}}{1-\exp\left(-\frac{Tm}{\beta}\right)^{\alpha}}$$,dimana :

α = parameter bentuk

β = parameter skala

1. Perhitungan *MTTFm Cane Cutter*
   - Pisau : α = 2,004 ; β = 315,849 ; Tm = 380,915

     $$MTTFm = \frac{\int_0^{380,915} \exp\left[-\left(\frac{t}{315,849}\right)^{2,004}\right] \mathrm{dt}}{1-\exp\left(-\frac{380,915}{315,849}\right)^{2,004}}$$

     $MTTFm = 333,035$ (jam)
   - Tangkai Pisau : α = 2,125 ; β = 927,507 ; Tm = 516,662

     $$MTTFm = \frac{\int_0^{516,662} \exp\left[-\left(\frac{t}{927,507}\right)^{2,125}\right] \mathrm{dt}}{1-\exp\left(-\frac{516,662}{927,507}\right)^{2,125}}$$

     $MTTFm = 1.887,084$ (jam)
   - Baut Pisau : α = 1,872 ; β = 1158,98 ; Tm = 952,506

     $$MTTFm = \frac{\int_0^{952,506} \exp\left[-\left(\frac{t}{1158,98}\right)^{1,872}\right] \mathrm{dt}}{1-\exp\left(-\frac{952,506}{1158,98}\right)^{1,872}}$$

     $MTTFm = 1.528,712$ (jam)
   - *Disk Rotor* : α = 1,806 ; β = 1190,78 ; Tm = 1269,756

     $$MTTFm = \frac{\int_0^{1269,756} \exp\left[-\left(\frac{t}{1190,78}\right)^{1,806}\right] \mathrm{dt}}{1-\exp\left(-\frac{1269,756}{1190,78}\right)^{1,806}}$$

     $MTTFm = 1.329,654$ (jam)

2. Perhitungan *MTTFm Intermediate Carrier 1*

- Baut *IMC 1* : α = 1,942 ; β = 1122,60 ; Tm = 939,755

$$MTTFm = \frac{\int_0^{939,755} \exp\left[-\left(\frac{t}{1122,60}\right)^{1,942}\right] dt}{1 - \exp(-\frac{939,755}{1122,60})^{1,942}}$$

$$MTTFm = 1.487,364 \text{ (jam)}$$

- Pen *IMC 1* : α = 1,749 ; β = 1162,84 ; Tm = 523,347

$$MTTFm = \frac{\int_0^{523,347} \exp\left[-\left(\frac{t}{1162,84}\right)^{1,749}\right] dt}{1 - \exp(-\frac{523,347}{1162,84})^{1,749}}$$

$$MTTFm = 2.187,443 \text{ (jam)}$$

- *Rake IMC* 1 : α = 1,645 ; β = 1165,14 ; Tm = 582,254

$$MTTFm = \frac{\int_0^{582,254} \exp\left[-\left(\frac{t}{1165,14}\right)^{1,645}\right] dt}{1 - \exp(-\frac{582,254}{1165,14})^{1,645}}$$

$$MTTFm = 1.895,538 \text{ (jam)}$$

- Rel *IMC 1* : α = 1,982 ; β = 1189,11 ; Tm = 829,646

$$MTTFm = \frac{\int_0^{829,646} \exp\left[-\left(\frac{t}{1189,11}\right)^{1,982}\right] dt}{1 - \exp(-\frac{829,646}{1189,11})^{1,982}}$$

$$MTTFm = 1.836,229 \text{ (jam)}$$

Hasil Perhitungan *MTTFm* dan *MTTF*

JENIS MESIN	NAMA KOMPONEN	*MTTFm* (jam)	*MTTF* (jam)	Selisih (jam)
CANE CUTTER	PISAU	333,035	157,293	175,742
	TANGKAI PISAU	1.887,084	411,813	1.475,271
	BAUT PISAU	1.528,712	650,188	878,524
	DISK ROTOR	1.329,654	706,133	623,521
IMC 1	BAUT *IMC* 1	1.487,364	591,610	895,754
	PEN *IMC* 1	2.187,443	723,286	1.464,157
	RAKE IMC 1	1.895,538	787,635	1.107,903
	REL *IMC* 1	1.836,229	604,068	1.232,161

Sumber : Pengolahan Data

Lampiran E : Total Biaya Perawatan

- Perhitungan Total Biaya Perawatan untuk data berdistribusi weibull dirumuskan sebagai berikut :
  - Perhitungan Perawatan Menggunakan Interval Perawatan Optimum (TM)

$$Tc = \frac{CR}{\beta^{\alpha}} TM^{\alpha-1} + \frac{CM}{TM} \quad \text{(Rp/jam)}$$

  - Perhitungan Perawatan Perusahaan (T)

$$Tc = \frac{CR}{\beta^{\alpha}} T^{\alpha-1} + \frac{CM}{TM} \quad \text{(Rp/jam)}$$

α = parameter bentuk

β = parameter skala

T = Interval pemeliharaan Perusahaan dalam jam

TM = Interval pemeliharaan optimal *(preventive maintenance)* dalam jam

CR = Biaya perbaikan atau pergantian karena rusaknya komponen untuk setiap kali siklus perawatan.

CM = Biaya yang dikeluarkan untuk perawatan *(preventive maintenance)* per kali siklus perawatan.

Perhitungan Biaya Perawatan Menggunakan Interval Perawatan Optimum (TM) :

1. Perhitungan Total Biaya Perawatan Baru dengan Interval TM (TcTM) *Cane Cutter*
   - Pisau : α = 2,004 ; β = 315,849 ; TM = 380,915 ; CR = 30.635.552,37 ; CM = 230.000

$$Tc = \frac{30.635.552,37}{315,849^{2,004}} 380,915^{2,004-1} + \frac{230.000}{380,915}$$

$$TcTM = 117.666,83 \text{ (Rp/jam)}$$

- Tangkai Pisau : α = 2,125 ; β = 927,507 ; TM = 516,662 ; CR = 376.321.365,99 ; CM = 230.000

$$Tc = \frac{376.321.365,99}{927,507^{2,125}} 516,662^{2,125-1} + \frac{230.000}{516,662}$$

$$TcTM = 210.516,69 \text{ (Rp/jam)}$$

- Baut Pisau : α = 1,872 ; β = 1.158,98 ; TM = 952,506 ; CR = 80.535.573,03 ; CM = 230.000

$$Tc = \frac{80.535.573,03}{1.158,98^{1,872}} 952,506^{1,872-1} + \frac{230.000}{952,506}$$

$$TcTM = 58.802,73 \text{ (Rp/jam)}$$

- *Disk Rotor* : α = 1,806 ; β = 1.190,78 ; TM = 1.269,756 ; CR = 44.658.752,96 ; CM = 230.000

$$Tc = \frac{44.658.752,96}{1.190,78^{1,806}} 1.269,756^{1,806-1} + \frac{230.000}{1.269,756}$$

$$TcTM = 39.667,16 \text{ (Rp/jam)}$$

2. Perhitungan Total Biaya Perawatan Baru dengan Interval TM (TcTM) *Intermediate Carrier 1*

- Baut *IMC 1* : α = 1,942 ; β = 1122,60 ; TM = 939,755 ; CR = 121.944.530,91 ; CM = 250.000

$$Tc = \frac{121.944.530,91}{1122,60^{1,942}} 939,755^{1,942-1} + \frac{230.000}{939,755}$$

$$TcTM = 92.142,65 \text{ (Rp/jam)}$$

- Pen *IMC 1* : α = 1,749 ; β = 1162,84 ; TM = 523,347 ; CR = 83.844.210,91 ; CM = 250.000

$$Tc = \frac{83.844.210,91}{1162,84^{1,749}} 523,347^{1,749-1} + \frac{230.000}{523,347}$$

$$TcTM = 40.128,51 \text{ (Rp/jam)}$$

- *Rake IMC 1* : α = 1,645 ; β = 1165,14 ; TM = 582,254 ; CR = 44.801.631,88 ; CM = 250.000

$$Tc = \frac{44.801.631,88}{1165,14^{1,645}} 582,254^{1,645-1} + \frac{230.000}{582,254}$$

$$TcTM = 25.010,36 \text{ (Rp/jam)}$$

- Rel *IMC 1* : α = 1,982 ; β = 1189,11 ; TM = 829,646 ; CR = 192.717.924,74 ; CM = 250.000

$$Tc = \frac{192.717.924,74}{1189,11^{1,982}} 829,646^{1,982-1} + \frac{230.000}{829,646}$$

$$TcTM = 114.112,48 \text{ (Rp/jam)}$$

Perhitungan Biaya Perawatan Menggunakan Jadwal Perawatan Perusahaan (T) :

1. Perhitungan Total Biaya Perawatan Perusahaan (TcT) *Cane Cutter*

- Pisau : α = 2,004 ; β = 315,849 ; T = 720 ; CR = 30.635.552,37 ; CM = 230.000

$$Tc = \frac{30.635.552,37}{315,849^{2,004}} 720^{2,004-1} + \frac{230.000}{720}$$

$$TcT = 222.154,72 \text{ (Rp/jam)}$$

- Tangkai Pisau : α = 2,125 ; β = 927,507 ; T = 720 ; CR = 376.321.365,99 ; CM = 230.000

$$Tc = \frac{376.321.365,99}{927,507^{2,125}} 720^{2,125-1} + \frac{230.000}{720}$$

$$TcT = 305.466,30 \text{ (Rp/jam)}$$

- Baut Pisau : α = 1,872 ; β = 1.158,98 ; T = 720 ; CR = 80.535.573,03 ; CM = 230.000

$$Tc = \frac{80.535.573,03}{1.158,98^{1,872}} 720^{1,872-1} + \frac{230.000}{720}$$

$$TcT = 46.200,30 \text{ (Rp/jam)}$$

- *Disk Rotor* : α = 1,806 ; β = 1.190,78 ; T = 720 ; CR = 44.658.752,96 ; CM = 230.000

$$Tc = \frac{44.658.752,96}{1.190,78^{1,806}} 720^{1,806-1} + \frac{230.000}{720}$$

$$TcT = 25.320,87 \text{ (Rp/jam)}$$

2. Perhitungan Total Biaya Perawatan Perusahaan (TcT) *Intermediate Carrier 1*

- Baut *IMC 1* : α = 1,942 ; β = 1122,60 ; T = 720 ; CR = 121.944.530,91 ; CM = 250.000

$$Tc = \frac{121.944.530,91}{1122,60^{1,942}} 720^{1,942-1} + \frac{230.000}{720}$$

$$TcT = 71.835,12 \text{ (Rp/jam)}$$

- Pen *IMC 1* : α = 1,749 ; β = 1162,84 ; T = 720 ; CR = 83.844.210,91 ; CM = 250.000

$$Tc = \frac{83.844.210,91}{1162,84^{1,749}} 720^{1,749-1} + \frac{230.000}{720}$$

$$TcT = 50.699,68 \text{ (Rp/jam)}$$

- *Rake IMC 1* : α = 1,645 ; β = 1165,14 ; T = 720 ; CR = 44.801.631,88 ; CM = 250.000

$$Tc = \frac{44.801.631,88}{1165,14^{1,645}} 720^{1,645-1} + \frac{230.000}{720}$$

$$TcT = 28.536,33 \text{ (Rp/jam)}$$

- Rel *IMC 1* : α = 1,982 ; β = 1189,11 ; T = 720 ; CR = 192.717.924,74 ; CM = 250.000

$$Tc = \frac{192.717.924,74}{1189,11^{1,982}} 720^{1,982-1} + \frac{230.000}{720}$$

$$TcT = 99.369,42 \text{ (Rp/jam)}$$

Hasil Perhitungan Penurunan Biaya

Nama Komponen	TcT (Rp/jam)	TcTM (Rp/jam)	TcT (Rp)	CF (Rp)	f	Tc (f) (Rp)	TcT + Tc (f) (Rp)	TcTM (Rp)	Penurunan Biaya (Rp)
Pisau	222.154,722	117.666,828	959.708.398,5	487.500	15	7.312.500	967.020.898,5	508.320.696,5	458.700.202,00
Tangkai Pisau	305.466,296	210.516,695	1.319.614.399,0	1.375.000	5	6.875.000	1.326.489.399,0	909.432.120,9	417.057.278,40
Baut Pisau	46.200,302	58.802,728	199.585.304,9	26.250	5	131.250	199.716.554,9	254.027.786,3	-54.311.231,41
Disk Rotor	25.320,874	39.677,157	109.386.174,6	7.500.000	5	37.500.000	146.886.174,6	171.405.317,0	-24.519.142,42
Baut IMC 1	71.835,118	92.142,652	310.327.710,9	26.250	4	105.000	310.432.710,9	398.056.257,2	-87.623.546,35
Pen IMC 1	50.699,684	40.128,514	219.022.634,3	462.500	4	1.850.000	220.872.634,3	173.355.179,0	47.517.455,31
Rake IMC 1	28.536,328	25.010,359	123.276.936,9	450.000	5	2.250.000	125.526.936,9	108.044.753,1	17.482.183,82
Rel IMC 1	99.369,419	114.112,480	429.275.888,9	1.650.000	4	6.600.000	435.875.888,9	492.965.914,6	-57.090.025,70
TOTAL BIAYA	**849.582,743**	**698.057,413**	**3.670.197.448**			**62.623.750**	**3.732.821.198**	**3.015.608.025**	**717.213.173,6**

Jadi total penurunan biaya dalam 1 musim giling untuk 2 mesin (CC dan IMC 1) adalah :

$$= \frac{\text{Penurunan Biaya}}{\text{TcT} + \text{Tc (f)}} \times 100\ \%$$

$$= \frac{717.213.173,6}{3.732.821.198} \times 100\ \%$$

$$= 19,21\ \%$$

Lampiran F: Downtime Perawatan Baru

Perhitungan Downtime Jadwal Perawatan Baru

Komponen	1 BLN(x)	6 BLN(x)	MTTR x 6 BLN (jam)
Pisau	2	12	1,543
Tangkai Pisau	2	12	19,190
Baut Pisau	1	6	1,788
Disk Rotor	1	6	0,951
Baut IMC 1	1	6	3,120
Pen IMC 1	2	12	4,268
Rake IMC 1	2	12	2,270
Rel IMC 1	1	6	4,889
Total (jam)			38,019

Downtime Perusahaan Lama

Komponen	Waktu Perbaikan (jam)	Waktu PMP (jam)	Total Down Time (jam)
Pisau	6,255	15	21,255
Tangkai Pisau	7,5	15	22,5
Baut Pisau	1,74	15	16,74
Disk Rotor	3,75	15	18,75
Baut IMC 1	2,08	15	17,08
Pen IMC 1	1,408	15	16,408
Rake IMC 1	3	15	18
Rel IMC 1	3,248	15	18,248
Total (jam)			148,981

Perhitungann Downtime Keseluruhan

Down Time		
Jadwal Perusahaan (jam)	Jadwal Perawatan Baru (jam)	Selisih (jam)
148,981	38,019	110,962