

Tabel 4.1 Data Available Time Pada Bulan Desember 2017 s/d
Nopember 2018

Bulan	Jumlah Hari Kerja	Total Shift (Jam)	Jam Kerja/Shift (Jam)			Total Actual Jam Kerja (Jam)	Menit
			Shift 1 (Jam)	Shift 2 (Jam)	Shift 3 (Jam)		
Desember 2017	24	3	8	8	8	576	34560
Januari 2018	26	3	8	8	8	624	37440
Pebruari 2018	23	3	8	8	8	552	33120
Maret 2018	25	3	8	8	8	600	36000
April 2018	24	3	8	8	8	576	34560
Mei 2018	24	3	8	8	8	576	34560
Juni 2018	15	3	8	8	8	360	21600
Juli 2018	27	3	8	8	8	648	38880
Agustus 2018	25	3	8	8	8	600	36000
September 2018	24	3	8	8	8	576	34560
Oktober 2018	27	3	8	8	8	648	38880
Nopember 2018	25	3	8	8	8	600	36000
TOTAL	289					6936	416160

Sumber: PT Megasurya Mas, 2019

Tabel 4.2 Data *Planned Downtime* Pada
Bulan Desember 2017 s/d Nopember 2018

Bulan	Lama Berhenti Mesin (Menit)	Jumlah Hari (Hari)	Jumlah Lama Berhenti Mesin (Menit)
Desember 2017	360	24	8640
Januari 2018	240	26	6240
Pebruari 2018	240	23	5520
Maret 2018	300	25	7500
April 2018	240	24	5760
Mei 2018	240	24	5760
Juni 2018	420	15	6300
Juli 2018	240	27	6480
Agustus 2018	300	25	7500
September 2018	240	24	5760
Oktober 2018	300	27	8100
Nopember 2018	240	25	6000
TOTAL	3360	289	79560

Sumber: PT. Megasurya Mas, 2019

Tabel 4.3 Data *Unplanned downtime* Pada
Bulan Desember 2017 s/d Nopember 2018

Bulan	Lama Waktu <i>Unplanned downtime</i> (Jam)	Total Waktu <i>Unplanned downtime</i> (Menit)
Desember 2017	2796.00	167760
Januari 2018	3654.00	219240
Pebruari 2018	2809.80	168588
Maret 2018	3153.00	189180
April 2018	4680.00	280800
Mei 2018	3874.80	232488
Juni 2018	3180.00	190800
Juli 2018	2974.80	178488
Agustus 2018	4653.00	279180
September 2018	5272.20	316332
Oktober 2018	6339.00	380340
Nopember 2018	3571.20	214272
TOTAL	46957.80	2817468

Sumber: PT. Megasurya Mas, 2019

Tabel 4.4 Data Lama Waktu Peralatan Menganggur (*idle and minor stoppage*) Pada Bulan Desember 2017 s/d Nopember 2018

Bulan	Lama Waktu <i>idle and minor stoppage</i> (Jam)	Total Waktu <i>idle and minor stoppage</i> (menit)
Desember 2017	51.00	3060
Januari 2018	40.00	2400
Pebruari 2018	36.00	2160
Maret 2018	33.00	1980
April 2018	37.00	2220
Mei 2018	36.00	2160
Juni 2018	65.00	3900
Juli 2018	38.00	2280
Agustus 2018	32.00	1920
September 2018	40.00	2400
Oktober 2018	38.00	2280
Nopember 2018	37.00	2220
TOTAL	483	28980

Sumber: PT. Megasurya Mas, 2018

Tabel 4.5 Data Produksi Pada Bulan Desember 2017 s/d Nopember 2018

BULAN	JUMLAH PRODUKSI (kg)
Desember 2017	57234.22
Januari 2018	80552.29
Pebruari 2018	88569.72
Maret 2018	78717.97
April 2018	86140.64
Mei 2018	81225.89
Juni 2018	93754.70
Juli 2018	93103.30
Agustus 2018	99122.01
September 2018	94134.87
Oktober 2018	98034.21
Nopember 2018	92548.36
TOTAL	1043138.18

Sumber: PT. Megasurya Mas, 2019

Tabel 4.6 Data Cacat Produksi Pada Bulan Desember 2017 s/d
Nopember 2018

BULAN	JUMLAH CACAT PRODUKSI (kg)
Desember 2017	1165.66
Januari 2018	1177.43
Pebruari 2018	1453.62
Maret 2018	1498.58
April 2018	1646.79
Mei 2018	1770.74
Juni 2018	1945.87
Juli 2018	2138.32
Agustus 2018	2349.80
September 2018	2068.25
Oktober 2018	2122.65
Nopember 2018	2238.25
TOTAL	21575.958

Sumber: PT. Megasurya Mas, 2019

Tabel 4.8 Perhitungan *Availability Ratio*

Bulan	Hari Kerja (Menit)	<i>Planned Downtime</i> (Menit)	<i>Unplanned Downtime</i> (Menit)	<i>Downtime</i> (Menit)	<i>Loading Time</i> (Menit)	<i>Available Ratio</i> (%)
Desember 2017	34560	8640	2796.00	11436.00	25920.00	55.88
Januari 2018	37440	6240	3654.00	9894.00	31200.00	68.29
Pebruari 2018	33120	5520	2809.80	8329.80	27600.00	69.82
Maret 2018	36000	7500	3153.00	10653.00	28500.00	62.62
April 2018	34560	5760	4680.00	10440.00	28800.00	63.75
Mei 2018	34560	5760	3874.80	9634.80	28800.00	66.55
Juni 2018	21600	6300	3180.00	9480.00	15300.00	38.04
Juli 2018	38880	6480	2974.80	9454.80	32400.00	70.82
Agustus 2018	36000	7500	4653.00	12153.00	28500.00	57.36
September 2018	34560	5760	5272.20	11032.20	28800.00	61.69
Oktober 2018	38880	8100	6339.00	14439.00	30780.00	53.09
Nopember 2018	36000	6000	3571.20	9571.20	30000.00	68.10
TOTAL	416160	79560	46957.80	126517.80	336600.00	736.00
RATA-RATA						61.33

Tabel 4.9 Perhitungan *Performance EfficiencyRatio*

Bulan	Loading Time (Menit)	Downtime (Menit)	Process Amount (Menit)	Theoretical Cycle Time (Menit)	Operating Time (Menit)	Performance Ratio (%)
Desember 2017	25920.00	11436.00	3170.78	4.88	14484.00	106.83
Januari 2018	31200.00	9894.00	4338.82	4.88	21306.00	99.38
Pebruari 2018	27600.00	8329.80	3362.60	4.88	19270.20	85.15
Maret 2018	28500.00	10653.00	5095.22	4.88	17847.00	139.32
April 2018	28800.00	10440.00	5833.10	4.88	18360.00	155.04
Mei 2018	28800.00	9634.80	5336.00	4.88	19165.20	135.87
Juni 2018	15300.00	9480.00	5921.21	4.88	5820.00	496.49
Juli 2018	32400.00	9454.80	5831.95	4.88	22945.20	124.03
Agustus 2018	28500.00	12153.00	6522.83	4.88	16347.00	194.72
September 2018	28800.00	11032.20	7410.83	4.88	17767.80	203.54
Oktober 2018	30780.00	14439.00	9644.48	4.88	16341.00	288.02
Nopember 2018	30000.00	9571.20	5316.61	4.88	20428.80	127.00
TOTAL	336600.00	126517.80	67784.43	58.56	210082.20	2155.40
RATA-RATA						179.62

Tabel 4.10 Perhitungan *Quality Ratio*

Bulan	Process Amount (Menit)	Jumlah Cacat Produksi (Kg)	Quality Ratio (%)
Desember 2017	3170.78	1165.66	63.24
Januari 2018	4338.82	1177.43	72.86
Pebruari 2018	3362.60	1453.62	56.77
Maret 2018	5095.22	1498.58	70.59
April 2018	5833.10	1646.79	71.77
Mei 2018	5336.00	1770.74	66.82
Juni 2018	5921.21	1945.87	67.14
Juli 2018	5831.95	2138.32	63.33
Agustus 2018	6522.83	2349.80	63.98
September 2018	7410.83	2068.25	72.09
Oktober 2018	9644.48	2122.65	77.99
Nopember 2018	5316.61	2238.25	57.90
TOTAL	67784.43	21575.96	68.17
RATA-RATA			67.04

Tabel 4.11 Perhitungan OEE

Bulan	Availability Ratio (%)	Performance Ratio (%)	Quality Ratio (%)	OEE (%)
Desember 2017	55.88	106.83	63.24	37.75
Januari 2018	68.29	99.38	72.86	49.45
Pebruari 2018	69.82	85.15	56.77	33.75
Maret 2018	62.62	139.32	70.59	61.58
April 2018	63.75	155.04	71.77	70.93
Mei 2018	66.55	135.87	66.82	60.41
Juni 2018	38.04	496.49	67.14	126.80
Juli 2018	70.82	124.03	63.33	55.63
Agustus 2018	57.36	194.72	63.98	71.45
September 2018	61.69	203.54	72.09	90.53
Oktober 2018	53.09	288.02	77.99	119.25
Nopember 2018	68.10	127.00	57.90	50.07
TOTAL	736.00	2155.40	68.17	827.62
RATA-RATA				68.97

Tabel 4.12 Perhitungan *Breakdown Loss*

BULAN	<i>BREAKDOWN LOSS</i> (%)	WAKTU DOWNTIME(Menit)	<i>LOADING TIME</i> (Menit)
Desember 2017	0.44	11436.00	25920.00
Januari 2018	0.32	9894.00	31200.00
Pebruari 2018	0.30	8329.80	27600.00
Maret 2018	0.37	10653.00	28500.00
April 2018	0.36	10440.00	28800.00
Mei 2018	0.33	9634.80	28800.00
Juni 2018	0.62	9480.00	15300.00
Juli 2018	0.29	9454.80	32400.00
Agustus 2018	0.43	12153.00	28500.00
September 2018	0.38	11032.20	28800.00
Oktober 2018	0.47	14439.00	30780.00
Nopember 2018	0.32	9571.20	30000.00
TOTAL	4.64	126517.80	336600.00

Keterangan:

$$\text{Breakdown loss} : \frac{\text{waktudowntime}}{\text{waktulading}} \times 100\%$$

$$: \frac{11436}{25920} \times 100\% = \mathbf{0,44\%}$$

Tabel 4.13 Perhitungan *Setup Loss*

BULAN	<i>SETUP LOSS</i> (%)	WAKTU <i>SETUP</i> (Menit)	<i>LOADING TIME</i> (Menit)
Desember 2017	0.00058	15.00	25920.00
Januari 2018	0.00064	20.00	31200.00
Pebruari 2018	0.00054	15.00	27600.00
Maret 2018	0.00053	15.00	28500.00
April 2018	0.00069	20.00	28800.00
Mei 2018	0.00052	15.00	28800.00
Juni 2018	0.00098	15.00	15300.00
Juli 2018	0.00062	20.00	32400.00
Agustus 2018	0.00053	15.00	28500.00
September 2018	0.00069	20.00	28800.00
Oktober 2018	0.00049	15.00	30780.00
Nopember 2018	0.00067	20.00	30000.00
TOTAL	0.0075	205.00	336600.00

Keterangan:

$$\begin{aligned} \text{Setup \& Adjustment loss} & : \frac{\text{waktusetup}}{\text{waktulading}} \times 100\% \\ & : \frac{15}{25920} \times 100\% \\ & = \mathbf{0.00058 \%} \end{aligned}$$

Tabel 4.14 Perhitungan *Idle & Minor Stoppage Loss*

BULAN	<i>IDLING & MINOR STOPPAGE (%)</i>	<i>TIME LOSS (Menit)</i>	<i>LOADING TIME (Menit)</i>
Desember 2017	11.81	3060.00	25920.00
Januari 2018	7.69	2400.00	31200.00
Pebruari 2018	7.83	2160.00	27600.00
Maret 2018	6.95	1980.00	28500.00
April 2018	7.71	2220.00	28800.00
Mei 2018	7.50	2160.00	28800.00
Juni 2018	25.49	3900.00	15300.00
Juli 2018	7.04	2280.00	32400.00
Agustus 2018	6.74	1920.00	28500.00
September 2018	8.33	2400.00	28800.00
Oktober 2018	7.41	2280.00	30780.00
Nopember 2018	7.40	2220.00	30000.00
TOTAL	111.88	28980.00	336600.00

Keterangan:

Idling & Minmor Stoppage loss :

$$\frac{\text{time loss}}{\text{waktu loading}} \times 100\%$$

:

$$\frac{3060}{25920} \times 100\% = \mathbf{11,81\%}$$

Time loss : Data dari *idling & minor stoppage*

Tabel 4.15 Perhitungan *Reduce Speed Loss*

BULAN	<i>REDUCE SPEED (%)</i>	<i>TIME LOSS (Menit)</i>
Desember 2017	0.00	0.00
Januari 2018	0.00	0.00
Pebruari 2018	0.00	0.00
Maret 2018	0.00	0.00
April 2018	0.00	0.00
Mei 2018	0.00	0.00
Juni 2018	0.00	0.00
Juli 2018	0.00	0.00
Agustus 2018	0.00	0.00
September 2018	0.00	0.00
Oktober 2018	0.00	0.00
Nopember 2018	0.00	0.00
TOTAL	0.00	0.00

Keterangan:

Reduce Speed Loss:

$$\frac{\text{waktu operasi} - (\text{idle cycle time} \times \Sigma \text{produksi})}{\text{waktu loading}} \times 100\%$$

: **0,00 %**

Time loss : waktu operasi – (idle cycle time x Σ produksi)

Tabel 4.16 Perhitungan *Defect in Proses*

BULAN	<i>DEFECT IN PROCESS (%)</i>	<i>TIME LOSS (Kg)</i>	JUMLAH PRODUKSI (Kg)
Desember 2017	2.04	1165.66	57234.22
Januari 2018	1.46	1177.43	80552.29
Pebruari 2018	1.64	1453.62	88569.72
Maret 2018	1.90	1498.58	78717.97
April 2018	1.91	1646.79	86140.64
Mei 2018	2.18	1770.74	81225.89
Juni 2018	2.08	1945.87	93754.70
Juli 2018	2.30	2138.32	93103.30
Agustus 2018	2.37	2349.80	99122.01
September 2018	2.20	2068.25	94134.87
Oktober 2018	2.17	2122.65	98034.21
Nopember 2018	2.42	2238.25	92548.36
TOTAL	24.66	21575.96	1043138.18

Keterangan:

$$Defect\ in\ Process : \frac{jumlah\ cacat}{jumlah\ produkst} \times 100\%$$

$$: \frac{1165.66}{57234.22} \times 100\% = 2,04\%$$

Tabel 4.17 Perhitungan *Reduced Yield Process*

BULAN	<i>REDUCED YIELD (%)</i>	JUMLAH YIELD (Kg)	JUMLAH PRODUKSI (Kg)
Desember 2017	10.93	6256.90	57234.22
Januari 2018	9.67	7787.80	80552.29
Pebruari 2018	5.99	5300.90	88569.72
Maret 2018	9.02	7096.70	78717.97
April 2018	9.71	8366.80	86140.64
Mei 2018	8.55	6946.20	81225.89
Juni 2018	6.83	6402.00	93754.70
Juli 2018	7.07	6584.60	93103.30
Agustus 2018	7.00	6937.50	99122.01
September 2018	8.31	7818.60	94134.87
Oktober 2018	11.23	11008.10	98034.21
Nopember 2018	6.25	5786.60	92548.36
TOTAL	100.55	86292.70	1043138.18

Keterangan:

$$\begin{aligned} \text{Reduced Yield Loss} &: \frac{\text{jumlah yield}}{\text{jumlah produksi}} \times 100\% \\ &: \frac{6256.90}{57234.22} \times 100\% = \mathbf{10,93\%} \end{aligned}$$

Tabel 5.1*Loss Pada Availability*

BULAN	DOWNTIME LOSSES			
	<i>BREAKDOWN LOSS</i>		<i>WAKTU SETUP</i>	
	(%)	(Menit)	(%)	(Menit)
Desember 2017	0.44	11436.00	0.00058	15.00
Januari 2018	0.32	9894.00	0.00064	20.00
Pebruari 2018	0.30	8329.80	0.00054	15.00
Maret 2018	0.37	10653.00	0.00053	15.00
April 2018	0.36	10440.00	0.00069	20.00
Mei 2018	0.33	9634.80	0.00052	15.00
Juni 2018	0.62	9480.00	0.00098	15.00
Juli 2018	0.29	9454.80	0.00062	20.00
Agustus 2018	0.43	12153.00	0.00053	15.00
September 2018	0.38	11032.20	0.00069	20.00
Oktober 2018	0.47	14439.00	0.00049	15.00
Nopember 2018	0.32	9571.20	0.00067	20.00
TOTAL	4.64	126517.80	0.0075	205.00

Tabel 5.2*Loss Pada Performance*

BULAN	SPEED LOSSES			
	<i>IDLE & MINOR LOSS</i>		<i>REDUCE SPEE LOSS</i>	
	(%)	(Menit)	(%)	(Menit)
Desember 2017	11.81	3060.00	0.00	0.00
Januari 2018	7.69	2400.00	0.00	0.00
Pebruari 2018	7.83	2160.00	0.00	0.00
Maret 2018	6.95	1980.00	0.00	0.00
April 2018	7.71	2220.00	0.00	0.00
Mei 2018	7.50	2160.00	0.00	0.00
Juni 2018	25.49	3900.00	0.00	0.00
Juli 2018	7.04	2280.00	0.00	0.00
Agustus 2018	6.74	1920.00	0.00	0.00
September 2018	8.33	2400.00	0.00	0.00
Oktober 2018	7.41	2280.00	0.00	0.00
Nopember 2018	7.40	2220.00	0.00	0.00
TOTAL	111.88	28980.00	0.00	0.00

Tabel 5.3 *Loss Pada Quality*

BULAN	DEFECT LOSSES			
	<i>DEFECT IN PROCES LOSS</i>		<i>REDUCE YIELD LOSS</i>	
	(%)	(Menit)	(%)	(Menit)
Desember 2017	2.04	1165.66	10.93	6256.90
Januari 2018	1.46	1177.43	9.67	7787.80
Pebruari 2018	1.64	1453.62	5.99	5300.90
Maret 2018	1.90	1498.58	9.02	7096.70
April 2018	1.91	1646.79	9.71	8366.80
Mei 2018	2.18	1770.74	8.55	6946.20
Juni 2018	2.08	1945.87	6.83	6402.00
Juli 2018	2.30	2138.32	7.07	6584.60
Agustus 2018	2.37	2349.80	7.00	6937.50
September 2018	2.20	2068.25	8.31	7818.60
Oktober 2018	2.17	2122.65	11.23	11008.10
Nopember 2018	2.42	2238.25	6.25	5786.60
TOTAL	24.66	21575.96	100.55	86292.70

Tabel 5.4 Perbandingan Nilai OEE Actual dan OEE Ideal

<i>OEEFACTOR</i>	<i>OEE ACTUAL</i>	<i>OEE IDEAL</i>	KETERANGAN
<i>Availability</i>	61.33	90%	IMPROVE
<i>Performance</i>	179.62	95%	GOOD
<i>Quality</i>	67.04	99%	IMPROVE
<i>OEE</i>	68.97	85%	IMPROVE