Lampiran A

Data observasi

PRODUK A

- Waktu observasi untuk department peleburan sebesar 2700 detik
-
- Waktu observasi departmen sand casting

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	147	11	159	21	153
2	143	12	148	22	147
3	157	13	151	23	144
4	151	14	143	24	143
5	154	15	153	25	140
6	152	16	158	26	146
7	156	17	152	27	152
8	150	18	154	28	157
9	146	19	152	29	147
10	152	20	149	30	154

- Waktu observasi departmen pencetakan

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	23	11	22	21	21
2	22	12	23	22	23
3	23	13	22	23	21
4	23	14	20	24	21
5	23	15	20	25	21
6	21	16	20	26	23
7	20	17	20	27	22
8	20	18	21	28	22
9	20	19	20	29	23
10	21	20	20	30	22

- Waktu observasi departmen perombakan

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	10	11	12	21	9
2	13	12	12	22	10
3	10	13	10	23	10
4	10	14	13	24	10
5	10	15	15	25	12
6	12	16	10	26	9
7	10	17	10	27	10
8	10	18	13	28	10
9	9	19	10	29	9
10	10	20	10	30	12

- Waktu observasi untuk department pembersihan 1200 detik.
- Waktu observasi departemen pendinginan.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	30	11	27	21	33
2	33	12	30	22	33
3	33	13	27	23	34
4	30	14	33	24	35
5	30	15	33	25	30
6	30	16	27	26	30
7	23	17	32	27	30
8	27	18	35	28	31
9	31	19	34	29	30
10	27	20	33	30	30

- Waktu observasi departemen penghalusan.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	5467	11	5887	21	5554
2	5523	12	5796	22	5647
3	5647	13	5857	23	5584
4	5526	14	5707	24	5372
5	5421	15	5672	25	5255
6	5421	16	5679	26	5341
7	5341	17	5571	27	5372
8	5255	18	5732	28	5433
9	5553	19	5786	29	5498
10	5584	20	5859	30	5372

- Waktu observasi departemen packing.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	1180	11	1240	21	1260
2	1210	12	1170	22	1290
3	1250	13	1180	23	1270
4	1150	14	1190	24	1230
5	1170	15	1160	25	1240
6	1230	16	1150	26	1220
7	1260	17	1210	27	1270
8	1160	18	1220	28	1260
9	1190	19	1240	29	1290
10	1170	20	1220	30	1190

PRODUK B

- Waktu observasi untuk department peleburan sebesar 2700 detik

- Waktu observasi departmen sand casting

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	149	11	147	21	151
2	157	12	155	22	154
3	153	13	148	23	150
4	148	14	157	24	153
5	154	15	150	25	147
6	156	16	152	26	156
7	148	17	154	27	152
8	152	18	155	28	155
9	149	19	152	29	149
10	156	20	149	30	153

- Waktu observasi departmen pencetakan

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	22	11	18	21	18
2	22	12	18	22	18
3	21	13	21	23	19
4	19	14	21	24	21
5	20	15	19	25	21
6	19	16	20	26	20
7	19	17	22	27	20
8	20	18	22	28	21
9	21	19	21	29	19
10	19	20	19	30	21

- Waktu observasi departmen perombakan

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	12	11	13	21	10
2	12	12	11	22	11
3	13	13	11	23	12
4	12	14	10	24	12
5	10	15	11	25	12
6	10	16	12	26	11
7	11	17	11	27	11
8	13	18	14	28	13
9	14	19	14	29	13
10	13	20	13	30	12

- Waktu observasi untuk department pembersihan 1200 detik.

- Waktu observasi departemen pendinginan.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	32	11	27	21	33
2	33	12	26	22	33
3	33	13	27	23	27
4	33	14	27	24	30
5	33	15	34	25	27
6	27	16	31	26	27
7	30	17	30	27	27
8	31	18	30	28	35
9	30	19	32	29	33
10	30	20	34	30	33

- Waktu observasi departemen penghalusan.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	5554	11	5421	21	5498
2	5647	12	5421	22	5255
3	5584	13	5431	23	5584
4	5372	14	5255	24	5467
5	5255	15	5553	25	5556
6	5341	16	5584	26	5558
7	5372	17	5467	27	5372
8	5433	18	5523	28	5281
9	5498	19	5647	29	5552
10	5372	20	5526	30	5584

- Waktu observasi departemen packing.

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	1570	11	1490	21	1500
2	1590	12	1530	22	1470
3	1600	13	1500	23	1550
4	1550	14	1510	24	1580
5	1530	15	1470	25	1490
6	1470	16	1500	26	1520
7	1550	17	1580	27	1530
8	1530	18	1540	28	1580
9	1470	19	1560	29	1550
10	1500	20	1590	30	1590

Lampiran B

Perhitungan waktu standar dan distribusi waktu

PRODUK A

A. Departemen Peleburan.

- Waktu peleburan = $\frac{45menit}{3000Kg}$
- $\frac{3000Kg}{7Kg} = 428{,}57$ Unit
- $\overline{X} = \frac{2700}{428.5} = 6.308$

1. Performance Rating
   - Good Skill (C1) +0,06
   - Good Condition (C) +0,02
   - Good Effort (C1) +0,05
   - Excellent Consistency +0,03

   0,16

2. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan
     a. Kelonggaran Berdiri 2
     b. Pekerjaan Dekat Tanur 5
     c. Keadaan Sedang 1
     d. Keadaan Menjemukan 2

     19

3. Waktu normal = 6.308 x 1,16
   = 7.317 detik

4. Waktu Standar = 7.317 x (1+19%)
   = 8.708 detik

B. Departemen Sand Casting.

1. Waktu Observasi WC 2

147	159	153
143	148	147
157	151	144
151	143	143
154	153	140
152	158	146
156	152	152
150	154	157
146	152	146
152	149	154

$\overline{X} = 150{,}30$

St Dev = 4,9768

$\sum X = 4509$

$$N' = \left(\frac{40\sqrt{(30x678424) - (4509)^2}}{4509}\right)^2 = 1{,}6958 \approx 2$$

$$BKA = \overline{X} + 3sd = 150{,}30 + 3x(4{,}9768) = 165{,}2304$$

$$BKB = \overline{X} - 3sd = 150{,}30 - 3x(4{,}9768) = 135{,}366$$

2. Performance Rating

• Excellent (B1)	+0,11
• Good Condition (C)	+0,02
• Good Effort (B2)	+0,08
• Excellent Consistency	+0,03
	0,24

3. Allowance

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran Berdiri	2
b. Beban yg Diangkat ± 5 kg	1
c. Keadaan udara buruk	5
d. Ketegangan penglihatan (Halus & Seksama)	2
e. Ketegangan Mental (agak rumit)	1
	20

4. Waktu normal = 150,30 x 1,24
= 186,37 Detik

5. Waktu Standar = 186,37 x (1+20%)
= 223,644 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Triangular[139, 161, 152]	98.9	accept
Beta[140, 159, 2.1, 1.75]	91	accept
Weibull[140, 2.54, 12]	74	accept
Uniform[140, 159]	20.3	accept
Lognormal[140, 2.24, 0.538]	19.2	accept
Pearson 5[140, 3.19, 25.5]	7.11	reject

C. Departemen Pencetakan.

1. Waktu Observasi (WC 3)

23	22	21
22	23	23
23	22	21
23	20	21
23	20	21
21	20	23
20	20	22
20	21	22
20	20	23
21	20	22

$\overline{X} = 21{,}433$

St Dev = 1,194

$\sum X = 643$

$$N' = \left(\frac{40\sqrt{(30x13823) - (643)^2}}{643}\right)^2 = 4{,}8 \approx 5$$

$$BKA = \overline{X} + 3sd = 21{,}433 + 3x(1{,}194) = 25{,}015$$

$$BKB = \overline{X} - 3sd = 21{,}433 - 3x(1{,}194) = 17{,}851$$

2. Performance Rating

• Good Skill (B2)	+0,08
• Good Condition (C)	+0,02
• Good Effort (C1)	+0,05
• Excellent Consistency	+0,03
	0,18

3. Allowance

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran berdiri	2
b. Beban ±7 kg	2
c. Keadaan Udara buruk	5
d. Ketegangan mental (agak rumit)	1
	19

4. Waktu normal = 21,433 x 1,18
= 25,29094 Detik

5. Waktu Standar = 25,29094 x (1+19%)
= 30,096 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Triangular(19, 24, 21.2)	99.8	accept
Erlang(20, 1, 1.43)	5.42	reject
Gamma(20, 1, 1.43)	5.42	reject
Exponential(20, 1.43)	5.42	reject
Pareto(20, 14.8)	5.04	reject
Uniform(20, 23)	0.103	reject
Pearson 6(20, 4.31e+03, 5.13, 1.08e+04)	0.00196	reject
Lognormal(20, 0.617, 0.466)	0.00151	reject
Weibull(20, 2.73, 2.31)	0.00147	reject
Log-Logistic(20, 3.47, 1.91)	0.00145	reject
Pearson 5(20, 4.66, 7.73)	0.00131	reject
Beta(20, 23, 4.4, 4.61)	0	reject
Inverse Gaussian	no fit	reject

D. Departemen Perombakan.

1. Waktu Observasi (WC 4)

10	12	9
13	12	10
10	10	10
10	13	10
10	15	12
12	10	9
10	10	10
10	13	10
9	10	9
10	10	12

$\overline{X}$ =10,667

St Dev = 1,4700

$\sum X$ =320

$$N' = \left(\frac{40\sqrt{(30x3476)-(320)^2}}{320}\right)^2 = 29{,}375 \approx 30$$

$$BKA = \overline{X} + 3sd = 10{,}667 + 3x(1{,}47) = 15{,}077$$

$$BKB = \overline{X} - 3sd = 10{,}667 - 3x(1{,}47) = 6{,}257$$

2. Performance Rating

• Good Skill (C1)	+0,06
• Good Condition (C)	+0,02
• Good Effort (C1)	+0,05
• Excellent Consistency	+0,03
	0,16

3. Allowance

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran Berdiri	2
b. Kelonggaran Membungkuk	2
c. Beban ±7 kg	2
d. Keadaaan udara buruk	5
	20

4. Waktu normal = 10,667 x 1,16
   = 12,3737 Detik

5. Waktu Standar = 12,3737 x (1+20%)
   = 14,8484 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Exponential(9, 1.67)	100	accept
Pareto(9, 6.19)	25.3	reject
Log-Logistic(9, 2.7, 1.42)	0.227	reject
Weibull(9, 1.53, 2.16)	0.113	reject
Triangular(8, 15.4, 9.96)	0.0373	reject
Lognormal(9, 0.44, 0.619)	0.014	reject
Pearson 6(9, 0.0243, 186, 3.39)	0.00951	reject
Pearson 5(9, 3.35, 4.44)	0.00948	reject
Beta(9, 1.63e+04, 2.47, 2.08e+04)	0.00215	reject
Inverse Gaussian(9, 6.53, 1.67)	0.000312	reject
Gamma(9, 7.24, 0.23)	0	reject
Erlang(9, 7, 0.238)	0	reject
Uniform(9, 15)	0	reject

E. Departemen Pendinginan.

1. Waktu Observasi (WC 5).

30	27	33
33	30	33
33	27	34
30	33	35
30	33	30
30	27	30
33	32	30
27	35	31
31	34	30
27	33	30

$\overline{X} = 31$

St Dev = 2,4212

$\sum X = 930$

$$N' = \left(\frac{40\sqrt{(30x29000) - (930)^2}}{930}\right)^2 = 9{,}43$$

$$BKA = \overline{X} + 3sd = 31 + 3x(2{,}4212) = 38{,}2636$$

$$BKB = \overline{X} - 3sd = 31 - 3x(2{,}4212) = 23{,}7364$$

2. Perfomance Rating
   - Good Skill (C2) +0,03
   - Good Condition (C) +0,02
   - Good Effort (C1) +0,05
   - Excellent Consistency +0,03

   0,13

3. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan
     a. Kelonggaran Berdiri 2
     b. Kelonggaran Membungkuk 2
     c. Beban ±7 kg 2
     d. Keadaaan udara buruk 5

     20

4. Waktu Normal = 31 x 0,13
   = 35,03 Detik

5. Waktu Standar = 35,03 x (1+20%)
   = 42,036 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[27, 35]	100	accept
Triangular[26, 36.5, 29.8]	45.4	accept
Weibull[27, 3.1, 5.44]	0.453	reject
Lognormal[27, 1.51, 0.369]	0.193	reject
Pearson 5[27, 7.67, 32.5]	0.156	reject
Beta[27, 35, 3.59, 2.67]	0.118	reject

F. Departemen Pembersihan.

- Waktu operasi = $\frac{15 menit}{30 pieces}$
- $X = \frac{900 \det ik}{30 pieces} = 30$

1. Performance Rating

• Good Skill (C2)	+0,03
• Good Condition (C)	+0,02
• Good Effort (C1)	+0,05
• Excellent Consistency	+0,03
	0,13

2. Allowance

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran berdiri	2
b. Kelonggaran membungkuk	2
c. Beban ±7 kg	2
d. Keadaan udara buruk	5
	20

3. Waktu normal = 30 x 1,13
   = 33.9 Detik

4. Waktu Standar = 1017 x (1+20%)
   = 40.68 Detik

G. Departemen Penghalusan.

1. Waktu Observasi

5887	5792	5670
5796	5272	5959
5857	5647	6001
5707	5539	5875
5672	5967	5502
5679	5827	5830
5571	5856	5758
5732	5759	5877
5786	5870	5970
5859	5859	5869

$\overline{X}$ =5774,833

St Dev = 157,473

$\sum X$ =173245

$$N' = \left(\frac{40\sqrt{(30x1001184709) - (173245)^2}}{173245}\right)^2 = 0{,}1159 \approx 1$$

$$BKA = \overline{X} + 3sd = 5774{,}833 + 3x(157{,}473) = 6247{,}252$$

$$BKB = \overline{X} - 3sd = 5774{,}833 - 3x(157{,}473) = 5302{,}414$$

2. Performance Rating
   - Excellent Skill (B1) +0,11
   - Good Condition (C) +0,02
   - Excellent Effort (B2) +0,08
   - Excellent Consistency +0,03

     0,24

3. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan
     a. Kelonggaran membungkuk 2
     b. Keadaan udara buruk 5
     c. Ketegangan penglihatan halus 2
     d. Ketegangan pendengaran terputus-putus (keras) 2

e.	Ketegangan mental (agak rumit)	1
f.	Keadaan membosankan	1
		22

4. Waktu normal = 5774,833 x 1,24
   = 7160,74 Detik

5. Waktu Standar = 7160,74 x (1+22%)
   = 8736,1638 Detik / 30 unit
   = 291.2054

Auto::Fit Distributions

distribution	rank	acceptance
Uniform(5.26e+03, 5.89e+03)	85.4	accept
Beta(5.26e+03, 5.94e+03, 1.69, 1.83)	71.1	accept
Weibull(5.26e+03, 2.11, 366)	60.9	accept
Pearson 6(5.26e+03, 1.01e+03, 4.21, 13.9)	48.1	accept
Lognormal(5.26e+03, 5.63, 0.59)	43.5	accept
Log-Logistic(5.26e+03, 2.88, 290)	38.6	accept
Pearson 5(5.26e+03, 2.84, 655)	34.2	accept
Inverse Gaussian(5.26e+03, 970, 302)	22.8	accept
Triangular(5.25e+03, 6.03e+03, 5.25e+03)	9.55	accept
Exponential(5.26e+03, 302)	7.63	reject
Pareto(5.26e+03, 18.1)	5.68	reject
Erlang(5.26e+03, 6, 50.3)	5.27	accept
Gamma(5.26e+03, 6.04, 50)	5.09	accept

H. Departemen Packing.

1. Waktu Observasi

1180	1240	1260
1210	1170	1290
1250	1180	1270
1150	1190	1230
1170	1160	1240
1230	1150	1220
1260	1210	1270
1160	1220	1260
1190	1240	1290
1170	1220	1190

$\overline{X} = 1215{,}667$

St Dev = 4,231926

$\sum X = 3647 \quad \sum X^2 = 443873$

$N' = \left(\frac{40\sqrt{(30x443873) - (3647)^2}}{3647}\right) = 1{,}87 \approx 2$

$BKA = \overline{X} + 3sd = 121{,}567 + 3x(4{,}232) = 134{,}263$

$BKB = \overline{X} - 3sd = 121{,}567 - 3x(4{,}232) = 108{,}871$

2. Performance Rating
   - Good Skill (C2) +0,03
   - Good Condition (C) +0,02
   - Good Effort (C1) +0,05
   - Excellent Consistency +0,03

   0,13

3. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan
     a. Kelonggaran berdiri 2
     b. Kelonggaran membungkuk 2
     c. Beban ±7 kg 2

   15

4. Waktu normal = 1215,667 x 1,13
   = 1373,7 Detik

5. Waktu Standar = 1373,7 x (1+15%)
   = 1579,755 Detik / 30 unit
   = 52,6 detik / unit

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[115, 129]	100	accept
Beta[115, 129, 1.51, 1.78]	73	accept
Pearson 6[115, 203, 2.43, 70.8]	55	accept
Weibull[115, 1.83, 7.9]	52.9	accept
Lognormal[115, 1.73, 0.753]	42.6	accept
Triangular[114, 132, 117]	31.4	accept
Log-Logistic[115, 2.32, 6.15]	30.2	accept
Erlang[115, 3, 2.19]	24.1	accept
Gamma[115, 3.38, 1.94]	14.8	accept
Pearson 5[115, 1.65, 6.66]	13.3	accept
Exponential[115, 6.57]	8.71	accept
Inverse Gaussian[115, 10.4, 6.57]	7.29	accept
Pareto[115, 18.2]	6.96	accept

PRODUK B

A. Departemen Peleburan

- Waktu peleburan = $\frac{45 menit}{3000 Kg}$
- $\frac{3000 Kg}{10 Kg} = 300$ Unit
- $\frac{2700 \det ik}{300 Unit} = 9$ detik / Unit

1. Performance Rating
   - Good Skill (C1) +0,06
   - Good Condition (C) +0,02
   - Good Effort (C1) +0,05
   - Excellent Consistency +0,03

     0,16

2. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan

a.	Kelonggaran Berdiri	2
b.	Pekerjaan Dekat Tanur	5
c.	Keadaan Sedang	1
d.	Keadaan Menjemukan	2
		19

3. Waktu normal = 9 x 1,16
   = 10,44 Detik

4. Waktu Standar = 10.44 x (1+19%)
   = 12.4236 Detik

B. Departemen Sand Casting.

1. Waktu Observasi

149	147	151
157	155	154
153	148	150
148	157	153
154	150	147
156	152	156
148	154	152
152	155	155
149	152	149
156	149	153

$\overline{X}$ =152,03

St Dev = 3,1236

$\sum X$ =4561

$$N' = \left(\frac{40\sqrt{(30x693707) - (4561)^2}}{4561}\right)^2 = 0{,}65 \approx 1$$

$$BKA = \overline{X} + 3sd = 152{,}03 + 3x(3{,}1236) = 161{,}4008$$

$$BKB = \overline{X} - 3sd = 152{,}03 - 3x(3{,}1236) = 142{,}6592$$

2. Performance Rating
   - Good Skill (C1) +0,11
   - Good Condition (C) +0,02

- Good Effort (B2) +0,08
- Excellent Consistency +0,03

0,24

3. Allowance

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran Berdiri	2
b. Beban yg Diangkat ± 5 kg	1
c. Keadaan udara buruk	5
d. Ketegangan penglihatan (Halus & Seksama)	2
e. Ketegangan Mental (agak rumit)	1
	20

4. Waktu normal = 152,03 x 1,24
   = 188,5172 Detik

5. Waktu Standar = 188,5172 x (1+20%)
   = 226,22064 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[147, 157]	100	accept
Beta[147, 157, 1.47, 1.46]	34.1	accept
Lognormal[147, 1.48, 0.715]	17.8	accept
Weibull[147, 1.94, 6.07]	17.5	accept
Pearson 5[147, 1.85, 6.05]	4.45	reject
Triangular	no fit	reject

C. Departemen Pencetakan.

1. Waktu Observasi

23	22	21
22	23	23
23	22	21
23	20	21
23	20	21

21	20	23
20	20	22
20	21	22
20	20	23
21	20	22

$\overline{X} = 21{,}433$

St Dev = 1,1943

$\sum X = 642{,}99$

$$N' = \left(\frac{40\sqrt{(30x13823) - (642{,}99)^2}}{642{,}99}\right) = 4{,}852 \approx 5$$

$$BKA = \overline{X} + 3sd = 21{,}433 + 3x(1{,}1943) = 25{,}0159$$

$$BKB = \overline{X} - 3sd = 21{,}433 - 3x(1{,}1943) = 30{,}096$$

2. Performance Rating
   - Good Skill (B2) +0,08
   - Good Condition (C) +0,02
   - Good Effort (C1) +0,05
   - Excellent Consistency +0,03

   0,18

3. Allowance
   - Kelonggaran Tetap 9
   - Kelonggaran Tambahan
     a. Kelonggaran berdiri 2
     b. Beban ±7 kg 2
     c. Keadaan Udara buruk 5
     d. Ketegangan mental (agak rumit) 1

   19

4. Waktu normal = 21,433 x 1,18
   = 25,0159 Detik

5. Waktu Standar = 25,0159 x (1+19%)
= 30,096 Detik

Auto::Fit Distributions

distribution	rank	acceptance
Triangular[19, 24, 21.2]	99.8	accept
Erlang[20, 1, 1.43]	5.42	reject
Gamma[20, 1, 1.43]	5.42	reject
Exponential[20, 1.43]	5.42	reject
Pareto[20, 14.8]	5.04	reject
Uniform[20, 23]	0.103	reject
Pearson 6[20, 4.31e+03, 5.13, 1.08e+04]	0.00196	reject
Lognormal[20, 0.617, 0.466]	0.00151	reject
Weibull[20, 2.73, 2.31]	0.00147	reject
Log-Logistic[20, 3.47, 1.91]	0.00145	reject
Pearson 5[20, 4.66, 7.73]	0.00131	reject
Beta[20, 23, 4.4, 4.61]	0	reject
Inverse Gaussian	no fit	reject

D. Departemen Perombakan.

1. Waktu Observasi.

12	13	10
12	11	11
13	11	12
12	10	12
10	11	12
10	12	11
11	11	11
13	14	13
14	14	13
13	13	12

$\overline{X}$ =11,9

St Dev = 1,2134

$\sum X$ =357

$$N' = \left(\frac{40\sqrt{(30x4291) - (357)^2}}{357}\right) = 16{,}08$$

$$BKA = \overline{X} + 3sd = 11{,}9 + 3x(1{,}2134) = 15{,}5402$$

$$BKB = \overline{X} - 3sd = 11{,}9 - 3x(1{,}2134) = 8{,}2598$$

2. Performance Rating.

• Good Skill (B2)	+0,06
• Good Condition (C)	+0,02
• Good Effort (C1)	+0,05
• Excellent Consistency	+0,03
	0,16

3. Allowance.

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran berdiri	2
b. Beban ±10 kg	3
c. Keadaan Udara buruk	5
d. Ketegangan mental (agak rumit)	3
	22

4. Waktu Normal = 11,9 x 1,16
= 13,804

5. Waktu Standar = 13,804 x (1+22%)
= 16,841detik

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[10, 14]	98.5	accept
Triangular[9, 14.5, 12.5]	42.2	accept
Erlang[10, 1, 1.9]	2.9	reject
Gamma[10, 1, 1.9]	2.9	reject
Exponential[10, 1.9]	2.9	reject
Weibull[10, 2.38, 2.48]	2.66	reject
Pearson 6[10, 64.6, 4.69, 139]	1.52	reject
Log-Logistic[10, 3.3, 2]	1.37	reject
Lognormal[10, 0.669, 0.497]	1.27	reject
Pareto[10, 5.92]	0.936	reject
Pearson 5[10, 4.16, 7.2]	0.929	reject
Beta[10, 14, 2.84, 2.96]	0.825	reject
Inverse Gaussian[10, 18.6, 1.9]	0.0021	reject

E. Departemen Pendinginan.

1. Waktu Observasi.

32	27	33
33	26	33
33	27	27
33	27	30
33	34	27
27	31	27
30	30	27
31	30	35
30	32	33
30	34	33

$\overline{X} = 30,5$

St Dev = 2,7512

$\sum X = 915$

$$N' = \left(\frac{40\sqrt{(30x28127) - (915)^2}}{915}\right) = 12,58 \approx 13$$

$$BKA = \overline{X} + 3sd = 30,5 + 3x(2,7512) = 38,7536$$

$$BKB = \overline{X} - 3sd = 30,5 - 3x(2,7512) = 22,2464$$

2. Performance Rating.

• Good Skill (B2)	+0,03
• Good Condition (C)	+0,02
• Good Effort (C1)	+0,05
• Excellent Consistency	+0,03
	0,13

3. Allowance.

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran berdiri	2
b. Beban ± 10 kg	3
c. Keadaan Udara buruk	5
d. Ketegangan mental (agak rumit)	3
	22

4. Waktu Normal = 30,5 x 1,13
   = 34,465

5. Waktu Standar = 34,465 x (1+22%)
   = 41,7026

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[26, 35]	100	accept
Beta[26, 35, 1.29, 1.35]	33.5	accept
Weibull[26, 1.75, 5.2]	20.5	reject
Triangular[25, 36.7, 28.9]	15	accept
Lognormal[26, 1.28, 0.822]	8.06	reject
Pearson 5[26, 1.49, 3.67]	0.779	reject

F. Departemen Pembersihan.

- Waktu operasi = $\frac{15 menit}{30 pieces}$
- X = $\frac{900 \det ik}{30 pieces} = 30$

1. Performance Rating
- Good Skill (C2) +0,03
- Good Condition (C) +0,02
- Good Effort (C1) +0,05
- Excellent Consistency +0,03

  0,13

2. Allowance
- Kelonggaran Tetap 9
- Kelonggaran Tambahan
  e. Kelonggaran berdiri 2
  f. Kelonggaran membungkuk 2

g. Beban ±7 kg 2

h. Keadaan udara buruk 5

20

3. Waktu normal = 30 x 1,13
= 33.9 Detik

4. Waktu Standar = 33.9 x (1+20%)
= 40.68 Detik

G. Departemen Penghalusan.

1. Waktu Observasi.

5554	5421	5498
5647	5421	5255
5584	5341	5584
5372	5255	5467
5255	5553	5556
5341	5584	5558
5372	5467	5372
5433	5523	5281
5498	5647	5552
5372	5526	5584

$\overline{X} = 5462{,}433$

St Dev = 553,8308

$\sum X = 160873$

$$N' = \left(\frac{40\sqrt{(30x871565867) - (160873)^2}}{160873}\right) = 16{,}49 \approx 17$$

$$BKA = \overline{X} + 3sd = 5362{,}433 + 3x(553{,}8308) = 7023{,}9254$$

$$BKB = \overline{X} - 3sd = 5362{,}433 - 3x(553{,}8308) = 3700{,}9421$$

2. Performance Rating.

- Good Skill (B2) +0,07
- Good Condition (C) +0,07

- Good Effort (C1) +0,05
- Excellent Consistency +0,05

0,24

3. Allowance.

• Kelonggaran Tetap	9
• Kelonggaran Tambahan	
a. Kelonggaran berdiri	2
b. Beban ±10 kg	3
c. Keadaan Udara buruk	5
d. Ketegangan mental (agak rumit)	3
	22

4. Waktu Normal = 5462,433 x 1,24
   = 6773,4169

5. Waktu Standar = 6773,4169 x (1+22%)
   = 8263,5686 / 30 unit
   = 275.45 / unit

Auto::Fit Distributions

distribution	rank	acceptance
Uniform(5.26e+03, 5.65e+03)	92.1	accept
Lognormal(5.26e+03, 5.3, 0.602)	51.3	accept
Pearson 5(5.26e+03, 2.16, 337)	19.9	accept
Weibull(5.26e+03, 2.51, 259)	19.3	accept
Beta(5.26e+03, 5.65e+03, 1.72, 1.16)	13.8	accept
Triangular(5.25e+03, 5.76e+03, 5.25e+03)	0.896	accept

4. Waktu normal = 1529,667 x 1,13
   = 1728,537 Detik

5. Waktu Standar = 1728,537 x (1+15%)
   = 1987,817 Detik / 30 unit
   = 66,26 detik / unit

Auto::Fit Distributions

distribution	rank	acceptance
Uniform[147, 160]	100	accept
Triangular[146, 163, 147]	15.9	accept
Exponential[147, 5.97]	15.6	accept
Pareto[147, 25.3]	13.3	accept
Pearson 5[147, 2.82, 13.8]	9.27	accept
Lognormal[147, 1.77, 0.594]	7.7	accept
Pearson 6[147, 16.9, 4.35, 11.6]	7.65	accept
Weibull[147, 2.14, 7.79]	6.6	reject
Beta[147, 160, 1.7, 1.59]	6.01	accept
Log-Logistic[147, 2.82, 6.2]	4.29	reject
Inverse Gaussian[147, 27, 5.97]	0.573	reject
Erlang[147, 42, 0.142]	0	reject
Gamma[147, 41.8, 0.143]	0	reject

H. Departemen Packing.

1. Waktu Observasi

	Waktu		Waktu		Waktu
No	Detik	No	Detik	No	Detik
1	1570	11	1490	21	1500
2	1590	12	1530	22	1470
3	1600	13	1500	23	1550
4	1550	14	1510	24	1580
5	1530	15	1470	25	1490
6	1470	16	1500	26	1520
7	1550	17	1580	27	1530
8	1530	18	1540	28	1580
9	1470	19	1560	29	1550
10	1500	20	1590	30	1590

$\overline{X} = 1529{,}667$

St Dev = 4,029

$\sum X = 4589$

$$N' = \left(\frac{40\sqrt{(30x702435) - (4589)^2}}{4589}\right)^2 = 1{,}073 \approx 2$$

$$BKA = \overline{X} + 3sd = 152{,}9667 + 3x(4{,}029) = 165{,}0537$$

$$BKB = \overline{X} - 3sd = 152{,}9667 - 3x(4{,}029) = 140{,}8797$$

2. Performance Rating

- Good Skill (B1) +0,03
- Good Condition (C) +0,02
- Good Effort (C1) +0,05
- Excellent Consistency +0,03

0,13

3. Allowance

- Kelonggaran Tetap 9
- Kelonggaran Tambahan
  a. Kelonggaran berdiri 2
  b. Kelonggaran membungkuk 2
  c. Beban ±7 kg 2

LAMPIRAN C

Angket penilaian kinerja operator oleh pihak management perusahaan

Penilaian effort kerja terhadap pekerja pada department peleburan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Penilaian effort kerja terhadap pekerja pada department sand casting

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Penilaian effort kerja terhadap pekerja pada department pencetakan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Penilaian effort kerja terhadap pekerja pada department perombakan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Penilaian effort kerja terhadap pekerja pada department pendinginan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Penilaian effort kerja terhadap pekerja pada department pembersihan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

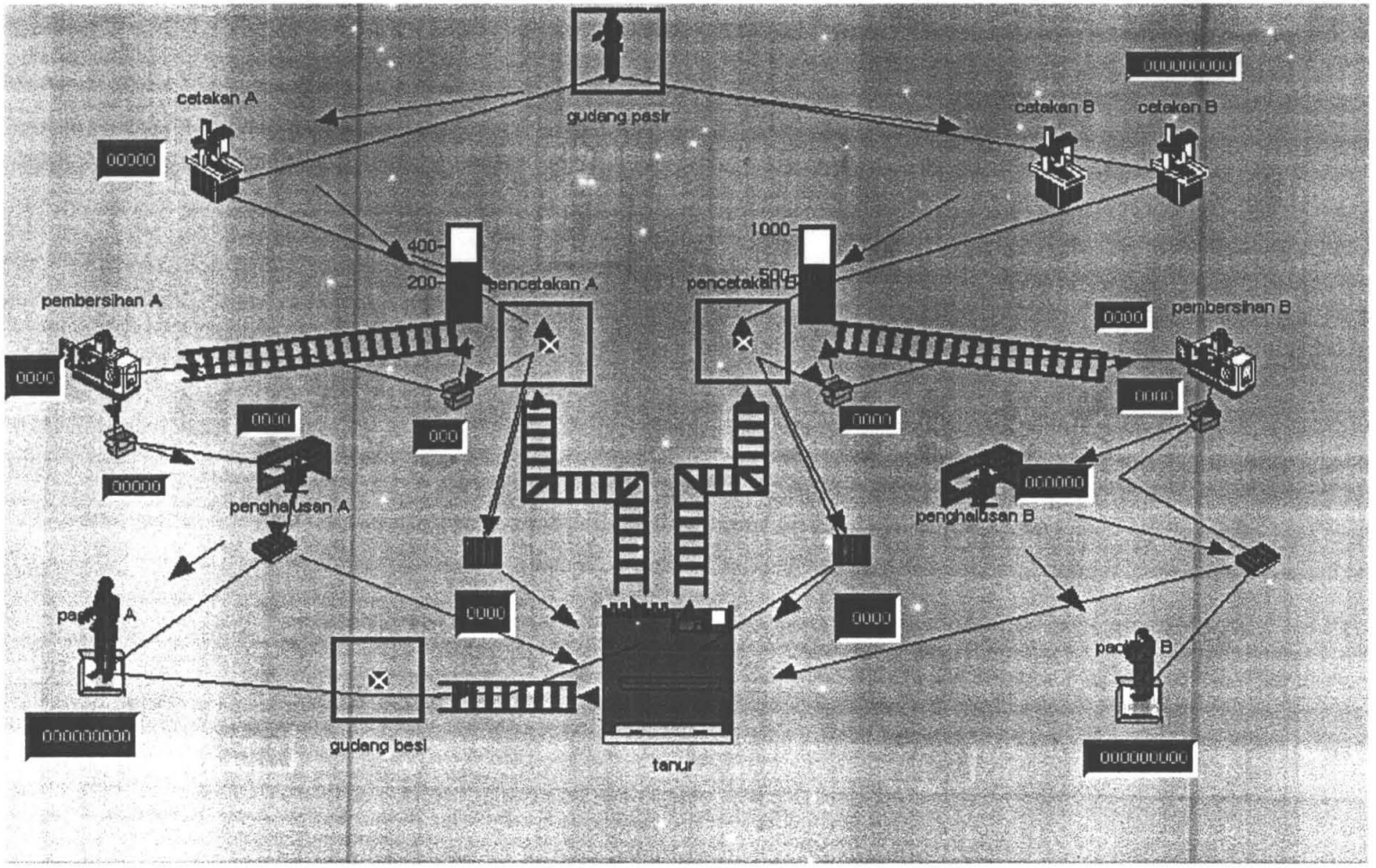
Penilaian effort kerja terhadap pekerja pada department penghalusan

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

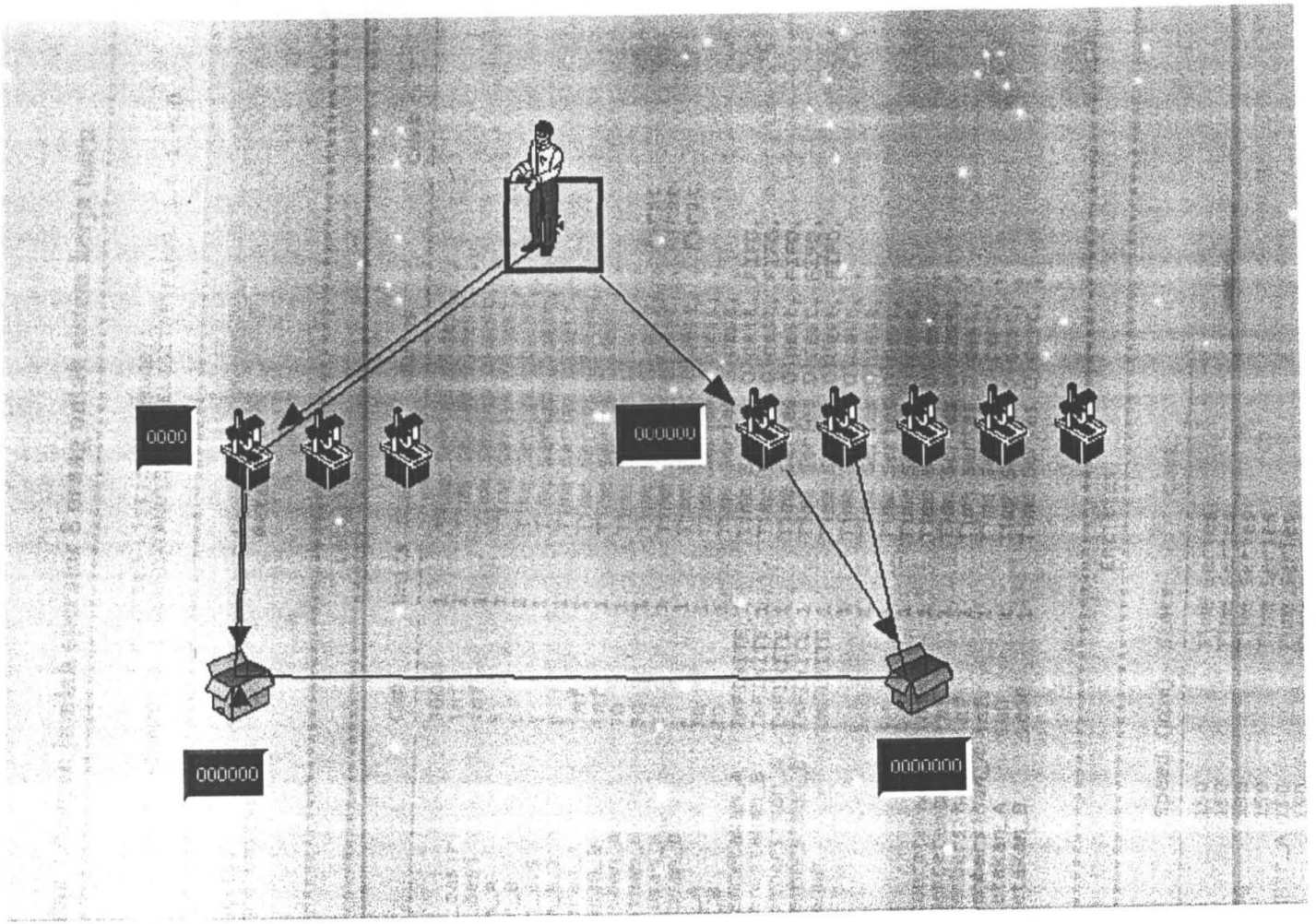
Penilaian effort kerja terhadap pekerja pada department packing

SKILL			EFFORT		
0.15	A 1	Superskill	0.13	A 1	Superskill
0.13	A 2		0.12	A 2	
0.11	B 1	Excellent	0.10	B 1	Excellent
0.08	B 2		0.08	B 2	
0.06	C 1	Good	0.05	C 1	Good
0.03	C 2		0.02	C 2	
0.00	D	Average	0.00	D	Average
-0.05	E 1	Fair	-0.04	E 1	Fair
-0.10	E 2		-0.08	E 2	
-0.16	F 1	Poor	-0.12	F 1	Poor
-0.22	F 2		-0.17	F 2	Poor
CONDITION			CONSISTENCY		
0.06	A	Ideal	0.04	A	Ideal
0.04	B	Excellent	0.03	B	Excellent
0.02	C	Good	0.01	C	Good
0.00	D	Average	0.00	D	Average
-0.03	E	Fair	-0.02	E	Fair
-0.07	F	Poor	-0.04	F	Poor

Lampiran D
Lay out proses produksi keseluruhan



Lay out proses produksi untuk departemen *sand casting*



Lampiran E
Input promodel

Text bulan I dengan jumlah operator 8 orang untuk sistem kerja baru

```
*****************************************************************************
*                                                                           *
*                        Formatted Listing of Model:                        *
*        C:\DOCUME~1\AM0235~1.GUN\DATAKU\DOC. FELISITAS\FINAL\1.8-1.MOD     *
*                                                                           *
*****************************************************************************

  Time Units:                         Seconds
  Distance Units:                     Meters


*****************************************************************************
*                                  Locations                                *
*****************************************************************************

  Name                 Cap      Units Stats       Rules           Cost
  -------------------- -------- ----- ----------- --------------- ------------
  tanur                3000     1     Time Series Oldest, ,
  gudang_pasir         inf      1     Time Series Oldest, ,
  gudang_besi          inf      1     Time Series Oldest, ,
  cetakan_A            5        1     Time Series Oldest, , First
  cetakan_B            5        2     Time Series Oldest, , First
  cetakan_B.1          5        1     Time Series Oldest, ,
  cetakan_B.2          5        1     Time Series Oldest, ,
  pencetakan_A         inf      1     Time Series Oldest, ,
  pencetakan_B         inf      1     Time Series Oldest, ,
  pembersihan_A        30       1     Time Series Oldest, ,
  pembersihan_B        30       1     Time Series Oldest, , First
  penghalusan_A        1        1     Time Series Oldest, , First
  penghalusan_B        1        1     Time Series Oldest, , First
  packing_A            30       1     Time Series Oldest, ,
  packing_B            30       1     Time Series Oldest, ,
  queue_pencetakan_A   INFINITE 1     Time Series Oldest, FIFO,
  queue_pencetakan_B   INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_A  INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_B  INFINITE 1     Time Series Oldest, FIFO,
  quene_tanur          INFINITE 1     Time Series Oldest, FIFO,
  rusak_1              1        1     Time Series Oldest, ,
  rusak_2              1        1     Time Series Oldest, ,
  sisa1                1        1     Time Series Oldest, ,
  sisa2                1        1     Time Series Oldest, ,
  buffer_pencetakan_B  inf      1     Time Series Oldest, ,
  buffer_pencetakan_A  inf      1     Time Series Oldest, ,
  buffer_pembersihan_B inf      1     Time Series Oldest, ,
  Buffer_pembersihan_A inf      1     Time Series Oldest, ,
  buffer_cetakan_A     500      1     Time Series Oldest, ,
  buffer_cetakan_B     1000     1     Time Series Oldest, ,

*****************************************************************************
*                                   Entities                                *
*****************************************************************************

  Name           Speed (mpm)  Stats       Cost
  -------------- ------------ ----------- ------------
  besi           150          Time Series
  pasir          150          Time Series
  besi_tuang     150          Time Series
  produk_A       150          Time Series
  produk_akhir_A 150          Time Series
  produk_B       150          Time Series
  produk_akhir_B 150          Time Series
  group_A        150          Time Series
  group_B        150          Time Series
```

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	12.23	1
			N2	N3	Bi	12.42	1
			N3	N4	Bi	23.09	1
			N4	N5	Bi	19.97	1
			N5	N6	Bi	7.25	1
			N6	N7	Bi	16.25	1
			N7	N8	Bi	6.14	1
			N8	N9	Bi	16.83	1
			N9	N10	Bi	13.83	1
			N10	N11	Bi	7.57	1
			N11	N12	Bi	19.09	1
Net2	Passing	Speed & Distance	N1	N2	Bi	7.17	1
			N2	N3	Bi	23.34	1
			N3	N4	Bi	36.33	1
			N4	N5	Bi	50.88	1
			N5	N6	Bi	33.79	1
			N6	N7	Bi	6.96	1
Net3	Passing	Speed & Distance	N1	N2	Bi	16.44	1
			N2	N3	Bi	14.62	1
			N3	N4	Bi	9.34	1
			N4	N5	Bi	5.43	1
			N5	N6	Bi	21.72	1
			N6	N7	Bi	12.06	1
			N7	N8	Bi	7.41	1
			N8	N9	Bi	19.47	1
			N10	N11	Bi	17.43	1

Interfaces

Net	Node	Location
Net1	N1	tanur
	N2	quene_tanur
	N3	gudang_besi
	N4	packing_A
	N5	sisa1
	N6	penghalusan_A
	N7	Buffer_pembersihan_A
	N8	pembersihan_A
	N9	queue_pembersihan_A
	N10	buffer_pencetakan_A
	N11	pencetakan_A
	N12	rusak_1
Net2	N1	pencetakan_A
	N2	buffer_cetakan_A
	N3	cetakan_A
	N4	gudang_pasir
	N5	cetakan_B
	N6	buffer_cetakan_B
	N7	pencetakan_B
Net3	N1	packing_B
	N2	sisa2
	N3	penghalusan_B
	N4	buffer_pembersihan_B
	N5	pembersihan_B
	N6	queue_pembersihan_B
	N7	buffer_pencetakan_B
	N8	pencetakan_B
	N9	rusak_2
	N11	tanur

Resources

Name	Units	Stats	Res Search	Ent Search	Path	Motion	Cost
Operator1	2	By Unit	Closest	Oldest	Net1 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator2	5	By Unit	Closest	Oldest	Net2 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator3	1	By Unit	Closest	Oldest	Net3 Home: N1 (Return)	Empty: 150 mpm Full: 150 mpm	

Processing

		Process		Routing			
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logic
besi	gudang_besi		1	besi	quene_tanur	FIRST 1	
besi	quene_tanur		1	besi	tanur	FIRST 1	
besi	tanur	USE Operator1 FOR 1.242 FREE Operator1					
			1	besi_tuang	queue_pencetakan_A	0.360000 1	
				besi_tuang	queue_pencetakan_B	0.640000	
besi_tuang	queue_pencetakan_A		1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	pencetakan_A	COMBINE 7 AS besi_tuang					
			1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	queue_pencetakan_B		1	besi_tuang	pencetakan_B	FIRST 1	
besi_tuang	pencetakan_B	COMBINE 10 AS besi_tuang					
			1	besi_tuang	pencetakan_B	FIRST 1	
pasir	gudang_pasir		1	pasir	cetakan_A	0.360000 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 + 1
				pasir	cetakan_B	0.640000	MOVE WITH Operator2 THEN FREE ps2 = ps2 + 1
pasir	cetakan_A	GROUP 5					
		USE Operator2 FOR T(139, 152, 161)					
		FREE Operator2					
			1	pasir	buffer_cetakan_A	FIRST 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 - 5
pasir	buffer_cetakan_A		1	pasir	pencetakan_A	LOAD 1	MOVE WITH Operator2 THEN FREE

pasir	cetakan_B	GROUP 5 USE Operator2 FOR U(147, 157) FREE Operator2	1	pasir	buffer_cetakan_B	FIRST 1	MOVE WITH Operator2 THEN FREE ps2 = ps2 - 5
pasir	buffer_cetakan_B		1	pasir	pencetakan_B	LOAD 1	MOVE WITH Operator2 THEN FREE
besi_tuang	pencetakan_A	LOAD 1 USE Operator1 FOR T(19, 21.2, 24) USE Operator1 FOR E(9, 1.67) FREE Operator1 WAIT U(27, 35)					
			1	produk_A	buffer_pencetakan_A	0.962000 1	MOVE WITH Operator1 THEN FREE ct1 = ct1 + 1
				produk_A	rusak_1	0.038000	MOVE WITH Operator1 THEN FREE
produk_A	rusak_1	var1 = var1 + 1	1	besi	tanur	FIRST 1	
produk_A	buffer_pencetakan_A		1	produk_A	queue_pembersihan_A	FIRST 1	ct1 = ct1 - 1
besi_tuang	pencetakan_B	LOAD 1 USE Operator3 FOR U(18, 22) USE Operator3 FOR U(10, 14) FREE Operator3 WAIT U(26, 35)					
			1	produk_B	buffer_pencetakan_B	0.962000 1	MOVE WITH Operator3 THEN FREE ct2 = ct2 + 1
				produk_B	rusak_2	0.038000	MOVE WITH Operator3 THEN FREE
produk_B	rusak_2	var2 = var2 + 1	1	besi	tanur	FIRST 1	
produk_B	buffer_pencetakan_B		1	produk_B	queue_pembersihan_B	FIRST 1	ct2 = ct2 - 1
produk_A	queue_pembersihan_A		1	produk_A	pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 + 1
ALL	pembersihan_A	GROUP 30 WAIT 1220.4					
			1	group_A	Buffer_pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 - 30 bf1 = bf1 + 30
group_A	Buffer_pembersihan_A	UNGROUP					
ALL	Buffer_pembersihan_A		1	produk_A	penghalusan_A	FIRST 1	MOVE WITH Operator1 THEN FREE bf1 = bf1 - 1 hls1 = hls1 + 1

```
produk_B        queue_pembersihan_B                     1   produk_B        pembersihan_B        FIRST 1     MOVE WITH Operator3
                                                                                                             THEN FREE
                                                                                                             cl2 = cl2 + 1
ALL             pembersihan_B       GROUP 30
                                    WAIT 1220.4
                                                        1   group_B         buffer_pembersihan_B FIRST 1     MOVE WITH Operator3
                                                                                                             THEN FREE
                                                                                                             cl2 = cl2 - 30
                                                                                                             bf2 = bf2 + 30
group_B         buffer_pembersihan_B UNGROUP
ALL             buffer_pembersihan_B                    1   produk_B        penghalusan_B        FIRST 1     MOVE WITH Operator3
                                                                                                             THEN FREE
                                                                                                             bf2 = bf2 - 1
                                                                                                             hls2 = hls2 + 1
produk_A        penghalusan_A
                                    USE Operator1  FOR U(5.26, 5.89)
                                    FREE Operator1
                                                        1   produk_akhir_A  packing_A            0.948200 1  MOVE WITH Operator1
                                                                                                             THEN FREE
                                                                                                             hls1 = hls1 - 1
                                                            produk_akhir_A  sisa1                0.051800    MOVE WITH Operator1
                                                                                                             THEN FREE
                                                                                                             hls1 = hls1 - 1
produk_akhir_A  sisa1                               1   besi            tanur                FIRST 1
ALL             packing_A           GROUP 30
                                    USE Operator1 FOR U(1.15, 1.29)
                                    FREE Operator1
                                    pck1 = pck1 + 1 1   produk_akhir_A  EXIT                 FIRST 1
produk_B        penghalusan_B
                                    USE  Operator3  FOR U(5.26, 5.65)
                                    FREE Operator3
                                                        1   produk_akhir_B  packing_B            0.948200 1  MOVE WITH Operator3
                                                                                                             THEN FREE
                                                                                                             hls2 = hls2 - 1
                                                            produk_akhir_B  sisa2                0.051800    MOVE WITH Operator3
                                                                                                             THEN FREE
                                                                                                             hls2 = hls2 - 1
produk_akhir_B  sisa2                               1   besi            tanur                FIRST 1
ALL             packing_B           GROUP 30
                                    USE Operator3 FOR U(1.47, 1.6)
                                    FREE Operator3
                                    pck2 = pck2 + 1 1   produk_akhir_B  EXIT                 FIRST 1
```

Arrivals

Entity	Location	Qty each	First Time	Occurrences	Frequency	Logic
besi	gudang_besi	3000	0	20	86400	
pasir	gudang_pasir	25920	0	1		
pasir	buffer_cetakan_A	480	0	1		
pasir	buffer_cetakan_B	842	0	1		

Shift Assignments

Locations	Resources	Shift Files	Priorities	Disable	Logic
	Operator1	C:\DOCUME~1\AM0235~1.GUN\Datak	99,99,99,99	No	
	Operator2				
	Operator3				

Variables (global)

ID	Type	Initial value	Stats
ct1	Integer	0	Time Series
ct2	Integer	0	Time Series
cl1	Integer	0	Time Series
cl2	Integer	0	Time Series
hls1	Integer	0	Time Series
hls2	Integer	0	Time Series
pck1	Integer	0	Time Series
pck2	Integer	0	Time Series
ps1	Integer	0	Time Series
ps2	Integer	0	Time Series
Var1	Integer	0	Time Series
Var2	Integer	0	Time Series
bf1	Integer	0	Time Series
bf2	Integer	0	Time Series

External Files

ID	Type	File Name	Prompt
(null)	Shift	C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\TA\Disket\new...sft	

Text bulan I dengan jumlah operator 9 orang untuk sistem kerja baru

```
************************************************************************************
*                                                                                  *
*                          Formatted Listing of Model:                             *
*        C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\1.9-1.MOD            *
*                                                                                  *
************************************************************************************

  Time Units:                         Seconds
  Distance Units:                     Meters


************************************************************************************
*                                   Locations                                      *
************************************************************************************

  Name                 Cap       Units Stats       Rules            Cost
  -------------------- --------- ----- ----------- ---------------- ------------
  tanur                3000      1     Time Series Oldest, ,
  gudang_pasir         inf       1     Time Series Oldest, ,
  gudang_besi          inf       1     Time Series Oldest, ,
  cetakan_A            5         1     Time Series Oldest, , First
  cetakan_B            5         2     Time Series Oldest, , First
  cetakan_B.1          5         1     Time Series Oldest, ,
  cetakan_B.2          5         1     Time Series Oldest, ,
  pencetakan_A         inf       1     Time Series Oldest, ,
  pencetakan_B         inf       1     Time Series Oldest, ,
  pembersihan_A        30        1     Time Series Oldest, ,
  pembersihan_B        30        1     Time Series Oldest, , First
  penghalusan_A        1         1     Time Series Oldest, , First
  penghalusan_B        1         1     Time Series Oldest, , First
  packing_A            30        1     Time Series Oldest, ,
  packing_B            30        1     Time Series Oldest, ,
  queue_pencetakan_A   INFINITE  1     Time Series Oldest, FIFO,
  queue_pencetakan_B   INFINITE  1     Time Series Oldest, FIFO,
  queue_pembersihan_A  INFINITE  1     Time Series Oldest, FIFO,
  queue_pembersihan_B  INFINITE  1     Time Series Oldest, FIFO,
  quene_tanur          INFINITE  1     Time Series Oldest, FIFO,
  rusak_1              1         1     Time Series Oldest, ,
  rusak_2              1         1     Time Series Oldest, ,
  sisa1                1         1     Time Series Oldest, ,
  sisa2                1         1     Time Series Oldest, ,
  buffer_pencetakan_B  inf       1     Time Series Oldest, ,
  buffer_pencetakan_A  inf       1     Time Series Oldest, ,
  buffer_pembersihan_B inf       1     Time Series Oldest, ,
  Buffer_pembersihan_A inf       1     Time Series Oldest, ,
  buffer_cetakan_A     500       1     Time Series Oldest, ,
  buffer_cetakan_B     1000      1     Time Series Oldest, ,


************************************************************************************
*                                    Entities                                      *
************************************************************************************

  Name            Speed (mpm)  Stats       Cost
  --------------- ------------ ----------- ------------
  besi            150          Time Series
  pasir           150          Time Series
  besi_tuang      150          Time Series
  produk_A        150          Time Series
  produk_akhir_A  150          Time Series
  produk_B        150          Time Series
  produk_akhir_B  150          Time Series
  group_A         150          Time Series
  group_B         150          Time Series
```

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	12.23	1
			N2	N3	Bi	12.42	1
			N3	N4	Bi	23.09	1
			N4	N5	Bi	19.97	1
			N5	N6	Bi	7.25	1
			N6	N7	Bi	16.25	1
			N7	N8	Bi	6.14	1
			N8	N9	Bi	16.83	1
			N9	N10	Bi	13.83	1
			N10	N11	Bi	7.57	1
			N11	N12	Bi	19.09	1
Net2	Passing	Speed & Distance	N1	N2	Bi	7.17	1
			N2	N3	Bi	23.34	1
			N3	N4	Bi	36.33	1
			N4	N5	Bi	50.88	1
			N5	N6	Bi	33.79	1
			N6	N7	Bi	6.96	1
Net3	Passing	Speed & Distance	N1	N2	Bi	16.44	1
			N2	N3	Bi	14.62	1
			N3	N4	Bi	9.34	1
			N4	N5	Bi	5.43	1
			N5	N6	Bi	21.72	1
			N6	N7	Bi	12.06	1
			N7	N8	Bi	7.41	1
			N8	N9	Bi	19.47	1
			N10	N11	Bi	17.43	1

Interfaces

Net	Node	Location
Net1	N1	tanur
	N2	quene_tanur
	N3	gudang_besi
	N4	packing_A
	N5	sisa1
	N6	penghalusan_A
	N7	Buffer_pembersihan_A
	N8	pembersihan_A
	N9	queue_pembersihan_A
	N10	buffer_pencetakan_A
	N11	pencetakan_A
	N12	rusak_1
Net2	N1	pencetakan_A
	N2	buffer_cetakan_A
	N3	cetakan_A
	N4	gudang_pasir
	N5	cetakan_B
	N6	buffer_cetakan_B
	N7	pencetakan_B
Net3	N1	packing_B
	N2	sisa2
	N3	penghalusan_B
	N4	buffer_pembersihan_B
	N5	pembersihan_B
	N6	queue_pembersihan_B
	N7	buffer_pencetakan_B
	N8	pencetakan_B
	N9	rusak_2
	N11	tanur

Resources

Name	Units	Stats	Res Search	Ent Search	Path	Motion	Cost
Operator1	2	By Unit	Closest	Oldest	Net1 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator2	5	By Unit	Closest	Oldest	Net2 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator3	2	By Unit	Closest	Oldest	Net3 Home: N1 (Return)	Empty: 150 mpm Full: 150 mpm	

Processing

		Process		Routing			
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logic
besi	gudang_besi		1	besi	quene_tanur	FIRST 1	
besi	quene_tanur		1	besi	tanur	FIRST 1	
besi	tanur	USE Operator1 FOR 1.242 FREE Operator1					
			1	besi_tuang	queue_pencetakan_A	0.360000 1	
				besi_tuang	queue_pencetakan_B	0.640000	
besi_tuang	queue_pencetakan_A		1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	pencetakan_A	COMBINE 7 AS besi_tuang					
			1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	queue_pencetakan_B		1	besi_tuang	pencetakan_B	FIRST 1	
besi_tuang	pencetakan_B	COMBINE 10 AS besi_tuang					
			1	besi_tuang	pencetakan_B	FIRST 1	
pasir	gudang_pasir		1	pasir	cetakan_A	0.360000 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 + 1
				pasir	cetakan_B	0.640000	MOVE WITH Operator2 THEN FREE ps2 = ps2 + 1
pasir	cetakan_A	GROUP 5					
		USE Operator2 FOR T(139, 152, 161)					
		FREE Operator2					
			1	pasir	buffer_cetakan_A	FIRST 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 - 5
pasir	buffer_cetakan_A		1	pasir	pencetakan_A	LOAD 1	MOVE WITH Operator2 THEN FREE

pasir	cetakan_B	GROUP 5 USE Operator2 FOR U(147, 157) FREE Operator2	1	pasir	buffer_cetakan_B	FIRST 1	MOVE WITH Operator2 THEN FREE ps2 = ps2 - 5
pasir	buffer_cetakan_B		1	pasir	pencetakan_B	LOAD 1	MOVE WITH Operator2 THEN FREE
besi_tuang	pencetakan_A	LOAD 1 USE Operator1 FOR T(19, 21.2, 24) USE Operator1 FOR E(9, 1.67) FREE Operator1 WAIT U(27, 35)	1	produk_A	buffer_pencetakan_A	0.962000 1	MOVE WITH Operator1 THEN FREE ct1 = ct1 + 1
				produk_A	rusak_1	0.038000	MOVE WITH Operator1 THEN FREE
produk_A	rusak_1	var1 = var1 + 1	1	besi	tanur	FIRST 1	
produk_A besi_tuang	buffer_pencetakan_A pencetakan_B	LOAD 1 USE Operator3 FOR U(18, 22) USE Operator3 FOR U(10, 14) FREE Operator3 WAIT U(26, 35)	1	produk_A	queue_pembersihan_A	FIRST 1	ct1 = ct1 - 1
			1	produk_B	buffer_pencetakan_B	0.962000 1	MOVE WITH Operator3 THEN FREE ct2 = ct2 + 1
				produk_B	rusak_2	0.038000	MOVE WITH Operator3 THEN FREE
produk_B	rusak_2	var2 = var2 + 1	1	besi	tanur	FIRST 1	
produk_B	buffer_pencetakan_B		1	produk_B	queue_pembersihan_B	FIRST 1	ct2 = ct2 - 1
produk_A	queue_pembersihan_A		1	produk_A	pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 + 1
ALL	pembersihan_A	GROUP 30 WAIT 1220.4					
			1	group_A	Buffer_pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 - 30 bf1 = bf1 + 30
group_A	Buffer_pembersihan_A	UNGROUP					
ALL	Buffer_pembersihan_A		1	produk_A	penghalusan_A	FIRST 1	MOVE WITH Operator1 THEN FREE bf1 = bf1 - 1 hls1 = hls1 + 1

```
produk_B        queue_pembersihan_B                     1   produk_B        pembersihan_B         FIRST 1     MOVE WITH Operator3
                                                                                                              THEN FREE
                                                                                                              cl2 = cl2 + 1
ALL             pembersihan_B       GROUP 30
                                    WAIT 1220.4
                                                        1   group_B         buffer_pembersihan_B  FIRST 1     MOVE WITH Operator3
                                                                                                              THEN FREE
                                                                                                              cl2 = cl2 - 30
                                                                                                              bf2 = bf2 + 30
group_B         buffer_pembersihan_B UNGROUP
ALL             buffer_pembersihan_B                    1   produk_B        penghalusan_B         FIRST 1     MOVE WITH Operator3
                                                                                                              THEN FREE
                                                                                                              bf2 = bf2 - 1
                                                                                                              hls2 = hls2 + 1
produk_A        penghalusan_A
                                    USE Operator1  FOR U(5.26, 5.89)
                                    FREE Operator1
                                                        1   produk_akhir_A  packing_A          0.948200 1  MOVE WITH Operator1
                                                                                                              THEN FREE
                                                                                                              hls1 = hls1 - 1
                                                            produk_akhir_A  sisa1              0.051800    MOVE WITH Operator1
                                                                                                              THEN FREE
                                                                                                              hls1 = hls1 - 1
produk_akhir_A  sisa1                               1   besi            tanur                 FIRST 1
ALL             packing_A           GROUP 30
                                    USE Operator1 FOR U(1.15, 1.29)
                                    FREE Operator1
                                    pck1 = pck1 + 1 1   produk_akhir_A  EXIT                  FIRST 1
produk_B        penghalusan_B
                                    USE  Operator3  FOR U(5.26, 5.65)
                                    FREE Operator3
                                                        1   produk_akhir_B  packing_B          0.948200 1  MOVE WITH Operator3
                                                                                                              THEN FREE
                                                                                                              hls2 = hls2 - 1
                                                            produk_akhir_B  sisa2              0.051800    MOVE WITH Operator3
                                                                                                              THEN FREE
                                                                                                              hls2 = hls2 - 1
produk_akhir_B  sisa2                               1   besi            tanur                 FIRST 1
ALL             packing_B           GROUP 30
                                    USE Operator3 FOR U(1.47, 1.6)
                                    FREE Operator3
                                    pck2 = pck2 + 1 1   produk_akhir_B  EXIT                  FIRST 1
```

Arrivals

Entity	Location	Qty each	First Time	Occurrences	Frequency	Logic
besi	gudang_besi	3000	0	20	86400	
pasir	gudang_pasir	25920	0	1		
pasir	buffer_cetakan_A	461	0	1		
pasir	buffer_cetakan_B	826	0	1		

Shift Assignments

Locations	Resources	Shift Files	Priorities	Disable	Logic
	Operator1	C:\DOCUME~1\AM0235~1.GUN\Datak	99,99,99,99	No	
	Operator2				
	Operator3				

Variables (global)

ID	Type	Initial value	Stats
ct1	Integer	0	Time Series
ct2	Integer	0	Time Series
cl1	Integer	0	Time Series
cl2	Integer	0	Time Series
hls1	Integer	0	Time Series
hls2	Integer	0	Time Series
pck1	Integer	0	Time Series
pck2	Integer	0	Time Series
ps1	Integer	0	Time Series
ps2	Integer	0	Time Series
Var1	Integer	0	Time Series
Var2	Integer	0	Time Series
bf1	Integer	0	Time Series
bf2	Integer	0	Time Series

External Files

ID	Type	File Name	Prompt
(null)	shift	C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\TA\Disket\new...sft	

Text bulan I dengan jumlah operator 10 orang untuk sistem kerja baru

```
********************************************************************************
*                                                                              *
*                        Formatted Listing of Model:                           *
*       C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\1.9-1.MOD         *
*                                                                              *
********************************************************************************

  Time Units:                         Seconds
  Distance Units:                     Meters


********************************************************************************
*                                  Locations                                   *
********************************************************************************

  Name                 Cap      Units Stats       Rules            Cost
  -------------------- -------- ----- ----------- ---------------- ------------
  tanur                3000     1     Time Series Oldest, ,
  gudang_pasir         inf      1     Time Series Oldest, ,
  gudang_besi          inf      1     Time Series Oldest, ,
  cetakan_A            5        1     Time Series Oldest, , First
  cetakan_B            5        2     Time Series Oldest, , First
  cetakan_B.1          5        1     Time Series Oldest, ,
  cetakan_B.2          5        1     Time Series Oldest, ,
  pencetakan_A         inf      1     Time Series Oldest, ,
  pencetakan_B         inf      1     Time Series Oldest, ,
  pembersihan_A        30       1     Time Series Oldest, ,
  pembersihan_B        30       1     Time Series Oldest, , First
  penghalusan_A        1        1     Time Series Oldest, , First
  penghalusan_B        1        1     Time Series Oldest, , First
  packing_A            30       1     Time Series Oldest, ,
  packing_B            30       1     Time Series Oldest, ,
  queue_pencetakan_A   INFINITE 1     Time Series Oldest, FIFO,
  queue_pencetakan_B   INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_A  INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_B  INFINITE 1     Time Series Oldest, FIFO,
  quene_tanur          INFINITE 1     Time Series Oldest, FIFO,
  rusak_1              1        1     Time Series Oldest, ,
  rusak_2              1        1     Time Series Oldest, ,
  sisa1                1        1     Time Series Oldest, ,
  sisa2                1        1     Time Series Oldest, ,
  buffer_pencetakan_B  inf      1     Time Series Oldest, ,
  buffer_pencetakan_A  inf      1     Time Series Oldest, ,
  buffer_pembersihan_B inf      1     Time Series Oldest, ,
  Buffer_pembersihan_A inf      1     Time Series Oldest, ,
  buffer_cetakan_A     500      1     Time Series Oldest, ,
  buffer_cetakan_B     1000     1     Time Series Oldest, ,


********************************************************************************
*                                  Entities                                    *
********************************************************************************

  Name           Speed (mpm)  Stats       Cost
  -------------- ------------ ----------- ------------
  besi           150          Time Series
  pasir          150          Time Series
  besi_tuang     150          Time Series
  produk_A       150          Time Series
  produk_akhir_A 150          Time Series
  produk_B       150          Time Series
  produk_akhir_B 150          Time Series
  group_A        150          Time Series
  group_B        150          Time Series
```

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	12.23	1
			N2	N3	Bi	12.42	1
			N3	N4	Bi	23.09	1
			N4	N5	Bi	19.97	1
			N5	N6	Bi	7.25	1
			N6	N7	Bi	16.25	1
			N7	N8	Bi	6.14	1
			N8	N9	Bi	16.83	1
			N9	N10	Bi	13.83	1
			N10	N11	Bi	7.57	1
			N11	N12	Bi	19.09	1
Net2	Passing	Speed & Distance	N1	N2	Bi	7.17	1
			N2	N3	Bi	23.34	1
			N3	N4	Bi	36.33	1
			N4	N5	Bi	50.88	1
			N5	N6	Bi	33.79	1
			N6	N7	Bi	6.96	1
Net3	Passing	Speed & Distance	N1	N2	Bi	16.44	1
			N2	N3	Bi	14.62	1
			N3	N4	Bi	9.34	1
			N4	N5	Bi	5.43	1
			N5	N6	Bi	21.72	1
			N6	N7	Bi	12.06	1
			N7	N8	Bi	7.41	1
			N8	N9	Bi	19.47	1
			N10	N11	Bi	17.43	1

Interfaces

Net	Node	Location
Net1	N1	tanur
	N2	quene_tanur
	N3	gudang_besi
	N4	packing_A
	N5	sisa1
	N6	penghalusan_A
	N7	Buffer_pembersihan_A
	N8	pembersihan_A
	N9	queue_pembersihan_A
	N10	buffer_pencetakan_A
	N11	pencetakan_A
	N12	rusak_1
Net2	N1	pencetakan_A
	N2	buffer_cetakan_A
	N3	cetakan_A
	N4	gudang_pasir
	N5	cetakan_B
	N6	buffer_cetakan_B
	N7	pencetakan_B
Net3	N1	packing_B
	N2	sisa2
	N3	penghalusan_B
	N4	buffer_pembersihan_B
	N5	pembersihan_B
	N6	queue_pembersihan_B
	N7	buffer_pencetakan_B
	N8	pencetakan_B
	N9	rusak_2
	N11	tanur

Resources

Name	Units	Stats	Res Search	Ent Search	Path	Motion	Cost
Operator1	2	By Unit	Closest	Oldest	Net1 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator2	5	By Unit	Closest	Oldest	Net2 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator3	3	By Unit	Closest	Oldest	Net3 Home: N1 (Return)	Empty: 150 mpm Full: 150 mpm	

Processing

		Process		Routing			
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logic
besi	gudang_besi		1	besi	quene_tanur	FIRST 1	
besi	quene_tanur		1	besi	tanur	FIRST 1	
besi	tanur	USE Operator1 FOR 1.242 FREE Operator1					
			1	besi_tuang	queue_pencetakan_A	0.360000 1	
				besi_tuang	queue_pencetakan_B	0.640000	
besi_tuang	queue_pencetakan_A		1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	pencetakan_A	COMBINE 7 AS besi_tuang					
			1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	queue_pencetakan_B		1	besi_tuang	pencetakan_B	FIRST 1	
besi_tuang	pencetakan_B	COMBINE 10 AS besi_tuang					
			1	besi_tuang	pencetakan_B	FIRST 1	
pasir	gudang_pasir		1	pasir	cetakan_A	0.360000 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 + 1
				pasir	cetakan_B	0.640000	MOVE WITH Operator2 THEN FREE ps2 = ps2 + 1
pasir	cetakan_A	GROUP 5					
		USE Operator2 FOR T(139, 152, 161)					
		FREE Operator2					
			1	pasir	buffer_cetakan_A	FIRST 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 - 5
pasir	buffer_cetakan_A		1	pasir	pencetakan_A	LOAD 1	MOVE WITH Operator2 THEN FREE

```
pasir          cetakan_B
                                GROUP 5
                                USE Operator2 FOR U(147, 157)
                                FREE Operator2
                                                1   pasir          buffer_cetakan_B      FIRST 1      MOVE WITH Operator2
                                                                                                      THEN FREE
                                                                                                      ps2 = ps2 - 5
pasir          buffer_cetakan_B                 1   pasir          pencetakan_B          LOAD 1       MOVE WITH Operator2
                                                                                                      THEN FREE

besi_tuang     pencetakan_A     LOAD 1

                                USE Operator1 FOR T(19, 21.2, 24)
                                USE Operator1  FOR E(9, 1.67)
                                FREE Operator1
                                WAIT U(27, 35)

                                                1   produk_A       buffer_pencetakan_A   0.962000 1   MOVE WITH Operator1
                                                                                                      THEN FREE
                                                                                                      ct1 = ct1 + 1
                                                    produk_A       rusak_1               0.038000     MOVE WITH Operator1
                                                                                                      THEN FREE
produk_A       rusak_1          var1 = var1 + 1  1   besi          tanur                 FIRST 1

produk_A       buffer_pencetakan_A              1   produk_A       queue_pembersihan_A   FIRST 1      ct1 = ct1 - 1
besi_tuang     pencetakan_B     LOAD 1

                                USE Operator3 FOR U(18, 22)
                                USE Operator3 FOR U(10, 14)
                                FREE Operator3
                                WAIT U(26, 35)



                                                1   produk_B       buffer_pencetakan_B   0.962000 1   MOVE WITH Operator3
                                                                                                      THEN FREE
                                                                                                      ct2 = ct2 + 1
                                                    produk_B       rusak_2               0.038000     MOVE WITH Operator3
                                                                                                      THEN FREE
produk_B       rusak_2          var2 = var2 + 1  1   besi          tanur                 FIRST 1
produk_B       buffer_pencetakan_B               1   produk_B       queue_pembersihan_B   FIRST 1      ct2 = ct2 - 1
produk_A       queue_pembersihan_A               1   produk_A       pembersihan_A         FIRST 1      MOVE WITH Operator1
                                                                                                      THEN FREE
                                                                                                      cl1 = cl1 + 1
ALL            pembersihan_A
                                GROUP 30
                                 WAIT 1220.4

                                                1   group_A        Buffer_pembersihan_A  FIRST 1      MOVE WITH Operator1
                                                                                                      THEN FREE
                                                                                                      cl1 = cl1 - 30
                                                                                                      bf1 = bf1 + 30
group_A        Buffer_pembersihan_A UNGROUP

ALL            Buffer_pembersihan_A             1   produk_A       penghalusan_A         FIRST 1      MOVE WITH Operator1
                                                                                                      THEN FREE
                                                                                                      bf1 = bf1 - 1
                                                                                                      hls1 = hls1 + 1
```

produk_B	queue_pembersihan_B		1	produk_B	pembersihan_B	FIRST 1	MOVE WITH Operator3 THEN FREE cl2 = cl2 + 1
ALL	pembersihan_B	GROUP 30 WAIT 1220.4					
			1	group_B	buffer_pembersihan_B	FIRST 1	MOVE WITH Operator3 THEN FREE cl2 = cl2 - 30 bf2 = bf2 + 30
group_B	buffer_pembersihan_B	UNGROUP					
ALL	buffer_pembersihan_B		1	produk_B	penghalusan_B	FIRST 1	MOVE WITH Operator3 THEN FREE bf2 = bf2 - 1 hls2 = hls2 + 1
produk_A	penghalusan_A						
		USE Operator1 FOR U(5.26, 5.89) FREE Operator1					
			1	produk_akhir_A	packing_A	0.948200 1	MOVE WITH Operator1 THEN FREE hls1 = hls1 - 1
				produk_akhir_A	sisa1	0.051800	MOVE WITH Operator1 THEN FREE hls1 = hls1 - 1
produk_akhir_A	sisa1		1	besi	tanur	FIRST 1	
ALL	packing_A	GROUP 30					
		USE Operator1 FOR U(1.15, 1.29)					
		FREE Operator1 pck1 = pck1 + 1	1	produk_akhir_A	EXIT	FIRST 1	
produk_B	penghalusan_B						
		USE Operator3 FOR U(5.26, 5.65) FREE Operator3					
			1	produk_akhir_B	packing_B	0.948200 1	MOVE WITH Operator3 THEN FREE hls2 = hls2 - 1
				produk_akhir_B	sisa2	0.051800	MOVE WITH Operator3 THEN FREE hls2 = hls2 - 1
produk_akhir_B	sisa2		1	besi	tanur	FIRST 1	
ALL	packing_B	GROUP 30					
		USE Operator3 FOR U(1.47, 1.6)					
		FREE Operator3 pck2 = pck2 + 1	1	produk_akhir_B	EXIT	FIRST 1	

Arrivals

Entity	Location	Qty each	First Time	Occurrences	Frequency	Logic
besi	gudang_besi	3000	0	20	86400	
pasir	gudang_pasir	25920	0	1		
pasir	buffer_cetakan_A	490	0	1		
pasir	buffer_cetakan_B	849	0	1		

Shift Assignments

Locations	Resources	Shift Files	Priorities	Disable	Logic
	Operator1	C:\DOCUME~1\AM0235~1.GUN\Datak	99,99,99,99	No	
	Operator2				
	Operator3				

Variables (global)

ID	Type	Initial value	Stats
ct1	Integer	0	Time Series
ct2	Integer	0	Time Series
cl1	Integer	0	Time Series
cl2	Integer	0	Time Series
hls1	Integer	0	Time Series
hls2	Integer	0	Time Series
pck1	Integer	0	Time Series
pck2	Integer	0	Time Series
ps1	Integer	0	Time Series
ps2	Integer	0	Time Series
Var1	Integer	0	Time Series
Var2	Integer	0	Time Series
bf1	Integer	0	Time Series
bf2	Integer	0	Time Series

External Files

ID	Type	File Name	Prompt
(null)	Shift	C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\TA\Disket\new...sft	

Text bulan I dengan jumlah operator 11 orang untuk sistem kerja baru

```
*****************************************************************************
*                                                                           *
*                        Formatted Listing of Model:                        *
*       C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\1.9-1.MOD      *
*                                                                           *
*****************************************************************************

  Time Units:                         Seconds
  Distance Units:                     Meters


*****************************************************************************
*                                  Locations                                *
*****************************************************************************

  Name                 Cap      Units Stats       Rules           Cost
  -------------------- -------- ----- ----------- --------------- ------------
  tanur                3000     1     Time Series Oldest, ,
  gudang_pasir         inf      1     Time Series Oldest, ,
  gudang_besi          inf      1     Time Series Oldest, ,
  cetakan_A            5        1     Time Series Oldest, , First
  cetakan_B            5        2     Time Series Oldest, , First
  cetakan_B.1          5        1     Time Series Oldest, ,
  cetakan_B.2          5        1     Time Series Oldest, ,
  pencetakan_A         inf      1     Time Series Oldest, ,
  pencetakan_B         inf      1     Time Series Oldest, ,
  pembersihan_A        30       1     Time Series Oldest, ,
  pembersihan_B        30       1     Time Series Oldest, , First
  penghalusan_A        1        1     Time Series Oldest, , First
  penghalusan_B        1        1     Time Series Oldest, , First
  packing_A            30       1     Time Series Oldest, ,
  packing_B            30       1     Time Series Oldest, ,
  queue_pencetakan_A   INFINITE 1     Time Series Oldest, FIFO,
  queue_pencetakan_B   INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_A  INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_B  INFINITE 1     Time Series Oldest, FIFO,
  quene_tanur          INFINITE 1     Time Series Oldest, FIFO,
  rusak_1              1        1     Time Series Oldest, ,
  rusak_2              1        1     Time Series Oldest, ,
  sisa1                1        1     Time Series Oldest, ,
  sisa2                1        1     Time Series Oldest, ,
  buffer_pencetakan_B  inf      1     Time Series Oldest, ,
  buffer_pencetakan_A  inf      1     Time Series Oldest, ,
  buffer_pembersihan_B inf      1     Time Series Oldest, ,
  Buffer_pembersihan_A inf      1     Time Series Oldest, ,
  buffer_cetakan_A     500      1     Time Series Oldest, ,
  buffer_cetakan_B     1000     1     Time Series Oldest, ,


*****************************************************************************
*                                  Entities                                 *
*****************************************************************************

  Name           Speed (mpm)  Stats       Cost
  -------------- ------------ ----------- ------------
  besi           150          Time Series
  pasir          150          Time Series
  besi_tuang     150          Time Series
  produk_A       150          Time Series
  produk_akhir_A 150          Time Series
  produk_B       150          Time Series
  produk_akhir_B 150          Time Series
  group_A        150          Time Series
  group_B        150          Time Series
```

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	12.23	1
			N2	N3	Bi	12.42	1
			N3	N4	Bi	23.09	1
			N4	N5	Bi	19.97	1
			N5	N6	Bi	7.25	1
			N6	N7	Bi	16.25	1
			N7	N8	Bi	6.14	1
			N8	N9	Bi	16.83	1
			N9	N10	Bi	13.83	1
			N10	N11	Bi	7.57	1
			N11	N12	Bi	19.09	1
Net2	Passing	Speed & Distance	N1	N2	Bi	7.17	1
			N2	N3	Bi	23.34	1
			N3	N4	Bi	36.33	1
			N4	N5	Bi	50.88	1
			N5	N6	Bi	33.79	1
			N6	N7	Bi	6.96	1
Net3	Passing	Speed & Distance	N1	N2	Bi	16.44	1
			N2	N3	Bi	14.62	1
			N3	N4	Bi	9.34	1
			N4	N5	Bi	5.43	1
			N5	N6	Bi	21.72	1
			N6	N7	Bi	12.06	1
			N7	N8	Bi	7.41	1
			N8	N9	Bi	19.47	1
			N10	N11	Bi	17.43	1

Interfaces

Net	Node	Location
Net1	N1	tanur
	N2	quene_tanur
	N3	gudang_besi
	N4	packing_A
	N5	sisa1
	N6	penghalusan_A
	N7	Buffer_pembersihan_A
	N8	pembersihan_A
	N9	queue_pembersihan_A
	N10	buffer_pencetakan_A
	N11	pencetakan_A
	N12	rusak_1
Net2	N1	pencetakan_A
	N2	buffer_cetakan_A
	N3	cetakan_A
	N4	gudang_pasir
	N5	cetakan_B
	N6	buffer_cetakan_B
	N7	pencetakan_B
Net3	N1	packing_B
	N2	sisa2
	N3	penghalusan_B
	N4	buffer_pembersihan_B
	N5	pembersihan_B
	N6	queue_pembersihan_B
	N7	buffer_pencetakan_B
	N8	pencetakan_B
	N9	rusak_2
	N11	tanur

Resources

Name	Units	Stats	Res Search	Ent Search	Path	Motion	Cost
Operator1	2	By Unit	Closest	Oldest	Net1 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator2	6	By Unit	Closest	Oldest	Net2 Home: N4 (Return)	Empty: 150 mpm Full: 150 mpm	
Operator3	2	By Unit	Closest	Oldest	Net3 Home: N1 (Return)	Empty: 150 mpm Full: 150 mpm	

Processing

		Process		Routing			
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logic
besi	gudang_besi		1	besi	quene_tanur	FIRST 1	
besi	quene_tanur		1	besi	tanur	FIRST 1	
besi	tanur	USE Operator1 FOR 1.242 FREE Operator1					
			1	besi_tuang	queue_pencetakan_A	0.360000 1	
				besi_tuang	queue_pencetakan_B	0.640000	
besi_tuang	queue_pencetakan_A		1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	pencetakan_A	COMBINE 7 AS besi_tuang					
			1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	queue_pencetakan_B		1	besi_tuang	pencetakan_B	FIRST 1	
besi_tuang	pencetakan_B	COMBINE 10 AS besi_tuang					
			1	besi_tuang	pencetakan_B	FIRST 1	
pasir	gudang_pasir		1	pasir	cetakan_A	0.360000 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 + 1
				pasir	cetakan_B	0.640000	MOVE WITH Operator2 THEN FREE ps2 = ps2 + 1
pasir	cetakan_A	GROUP 5 USE Operator2 FOR T(139, 152, 161) FREE Operator2					
			1	pasir	buffer_cetakan_A	FIRST 1	MOVE WITH Operator2 THEN FREE ps1 = ps1 - 5
pasir	buffer_cetakan_A		1	pasir	pencetakan_A	LOAD 1	MOVE WITH Operator2 THEN FREE

pasir	cetakan_B	GROUP 5 USE Operator2 FOR U(147, 157) FREE Operator2	1	pasir	buffer_cetakan_B	FIRST 1	MOVE WITH Operator2 THEN FREE ps2 = ps2 - 5
pasir	buffer_cetakan_B		1	pasir	pencetakan_B	LOAD 1	MOVE WITH Operator2 THEN FREE
besi_tuang	pencetakan_A	LOAD 1 USE Operator1 FOR T(19, 21.2, 24) USE Operator1 FOR E(9, 1.67) FREE Operator1 WAIT U(27, 35)					
			1	produk_A	buffer_pencetakan_A	0.962000 1	MOVE WITH Operator1 THEN FREE ct1 = ct1 + 1
				produk_A	rusak_1	0.038000	MOVE WITH Operator1 THEN FREE
produk_A	rusak_1	var1 = var1 + 1	1	besi	tanur	FIRST 1	
produk_A	buffer_pencetakan_A		1	produk_A	queue_pembersihan_A	FIRST 1	ct1 = ct1 - 1
besi_tuang	pencetakan_B	LOAD 1 USE Operator3 FOR U(18, 22) USE Operator3 FOR U(10, 14) FREE Operator3 WAIT U(26, 35)					
			1	produk_B	buffer_pencetakan_B	0.962000 1	MOVE WITH Operator3 THEN FREE ct2 = ct2 + 1
				produk_B	rusak_2	0.038000	MOVE WITH Operator3 THEN FREE
produk_B	rusak_2	var2 = var2 + 1	1	besi	tanur	FIRST 1	
produk_B	buffer_pencetakan_B		1	produk_B	queue_pembersihan_B	FIRST 1	ct2 = ct2 - 1
produk_A	queue_pembersihan_A		1	produk_A	pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 + 1
ALL	pembersihan_A	GROUP 30 WAIT 1220.4					
			1	group_A	Buffer_pembersihan_A	FIRST 1	MOVE WITH Operator1 THEN FREE cl1 = cl1 - 30 bf1 = bf1 + 30
group_A	Buffer_pembersihan_A	UNGROUP					
ALL	Buffer_pembersihan_A		1	produk_A	penghalusan_A	FIRST 1	MOVE WITH Operator1 THEN FREE bf1 = bf1 - 1 hls1 = hls1 + 1

produk_B	queue_pembersihan_B		1	produk_B	pembersihan_B	FIRST 1	MOVE WITH Operator3 THEN FREE c12 = c12 + 1
ALL	pembersihan_B	GROUP 30 WAIT 1220.4					
			1	group_B	buffer_pembersihan_B	FIRST 1	MOVE WITH Operator3 THEN FREE c12 = c12 - 30 bf2 = bf2 + 30
group_B	buffer_pembersihan_B	UNGROUP					
ALL	buffer_pembersihan_B		1	produk_B	penghalusan_B	FIRST 1	MOVE WITH Operator3 THEN FREE bf2 = bf2 - 1 hls2 = hls2 + 1
produk_A	penghalusan_A						
		USE Operator1 FOR U(5.26, 5.89) FREE Operator1					
			1	produk_akhir_A	packing_A	0.948200 1	MOVE WITH Operator1 THEN FREE hls1 = hls1 - 1
				produk_akhir_A	sisa1	0.051800	MOVE WITH Operator1 THEN FREE hls1 = hls1 - 1
produk_akhir_A	sisa1		1	besi	tanur	FIRST 1	
ALL	packing_A	GROUP 30					
		USE Operator1 FOR U(1.15, 1.29)					
		FREE Operator1 pck1 = pck1 + 1	1	produk_akhir_A	EXIT	FIRST 1	
produk_B	penghalusan_B						
		USE Operator3 FOR U(5.26, 5.65) FREE Operator3					
			1	produk_akhir_B	packing_B	0.948200 1	MOVE WITH Operator3 THEN FREE hls2 = hls2 - 1
				produk_akhir_B	sisa2	0.051800	MOVE WITH Operator3 THEN FREE hls2 = hls2 - 1
produk_akhir_B	sisa2		1	besi	tanur	FIRST 1	
ALL	packing_B	GROUP 30					
		USE Operator3 FOR U(1.47, 1.6)					
		FREE Operator3 pck2 = pck2 + 1	1	produk_akhir_B	EXIT	FIRST 1	

Arrivals

Entity	Location	Qty each	First Time	Occurrences	Frequency	Logic
besi	gudang_besi	3000	0	20	86400	
pasir	gudang_pasir	25920	0	1		
pasir	buffer_cetakan_A	531	0	1		
pasir	buffer_cetakan_B	886	0	1		

Shift Assignments

Locations	Resources	Shift Files	Priorities	Disable	Logic
	Operator1	C:\DOCUME~1\AM0235~1.GUN\Datak	99,99,99,99	No	
	Operator2				
	Operator3				

Variables (global)

ID	Type	Initial value	Stats
ct1	Integer	0	Time Series
ct2	Integer	0	Time Series
cl1	Integer	0	Time Series
cl2	Integer	0	Time Series
hls1	Integer	0	Time Series
hls2	Integer	0	Time Series
pck1	Integer	0	Time Series
pck2	Integer	0	Time Series
ps1	Integer	0	Time Series
ps2	Integer	0	Time Series
Var1	Integer	0	Time Series
Var2	Integer	0	Time Series
bf1	Integer	0	Time Series
bf2	Integer	0	Time Series

External Files

ID	Type	File Name	Prompt
(null)	Shift	C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\TA\Disket\new...sft	

Text bulan I dengan jumlah operator 17 orang untuk sistem kerja lama.

```
*****************************************************************************
*                                                                           *
*                        Formatted Listing of Model:                        *
*                I:\TA Akhir\Promod\TA  LAMA.............MOD                 *
*                                                                           *
*****************************************************************************

  Time Units:                         Seconds
  Distance Units:                     Meters


*****************************************************************************
*                                  Locations                                *
*****************************************************************************

  Name                 Cap      Units Stats       Rules           Cost
  -------------------- -------- ----- ----------- --------------- ------------
  tanur                3000     1     Time Series Oldest, ,
  gudang_pasir         inf      1     Time Series Oldest, ,
  gudang_besi          inf      1     Time Series Oldest, ,
  cetakan_A            5        2     Time Series Oldest, , First
  cetakan_A.1          5        1     Time Series Oldest, ,
  cetakan_A.2          5        1     Time Series Oldest, ,
  cetakan_B            5        4     Time Series Oldest, , First
  cetakan_B.1          5        1     Time Series Oldest, ,
  cetakan_B.2          5        1     Time Series Oldest, ,
  cetakan_B.3          5        1     Time Series Oldest, ,
  cetakan_B.4          5        1     Time Series Oldest, ,
  pencetakan_A         inf      1     Time Series Oldest, ,
  pencetakan_B         inf      1     Time Series Oldest, ,
  pembersihan_A        30       1     Time Series Oldest, ,
  pembersihan_B        30       1     Time Series Oldest, , First
  penghalusan_A        1        2     Time Series Oldest, , First
  penghalusan_A.1      1        1     Time Series Oldest, ,
  penghalusan_A.2      1        1     Time Series Oldest, ,
  penghalusan_B        1        4     Time Series Oldest, , First
  penghalusan_B.1      1        1     Time Series Oldest, ,
  penghalusan_B.2      1        1     Time Series Oldest, ,
  penghalusan_B.3      1        1     Time Series Oldest, ,
  penghalusan_B.4      1        1     Time Series Oldest, ,
  packing_A            30       1     Time Series Oldest, ,
  packing_B            30       2     Time Series Oldest, , First
  packing_B.1          30       1     Time Series Oldest, ,
  packing_B.2          30       1     Time Series Oldest, ,
  queue_pencetakan_A   INFINITE 1     Time Series Oldest, FIFO,
  queue_pencetakan_B   INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_A  INFINITE 1     Time Series Oldest, FIFO,
  queue_pembersihan_B  INFINITE 1     Time Series Oldest, FIFO,
  quene_tanur          INFINITE 1     Time Series Oldest, FIFO,
  rusak_1              1        1     Time Series Oldest, ,
  rusak_2              1        1     Time Series Oldest, ,
  sisa1                1        1     Time Series Oldest, ,
  sisa2                1        1     Time Series Oldest, ,
  buffer_pencetakan_B  inf      1     Time Series Oldest, ,
  buffer_pencetakan_A  inf      1     Time Series Oldest, ,
  buffer_pembersihan_B inf      1     Time Series Oldest, ,
  Buffer_pembersihan_A inf      1     Time Series Oldest, ,
  buffer_cetakan_A     600      1     Time Series Oldest, ,
  buffer_cetakan_B     1500     1     Time Series Oldest, ,


*****************************************************************************
*                                  Entities                                 *
*****************************************************************************

  Name           Speed (mpm)  Stats       Cost
  -------------- ------------ ----------- ------------
  besi           150          Time Series
  pasir          150          Time Series
  besi_tuang     150          Time Series
  produk_A       150          Time Series
  produk_akhir_A 150          Time Series
  produk_B       150          Time Series
  produk_akhir_B 150          Time Series
  group_A        150          Time Series
  group_B        150          Time Series
```

Path Networks

Name	Type	T/S	From	To	BI	Dist/Time	Speed Factor
Net1	Passing	Speed & Distance	N1	N2	Bi	12.34	1
			N2	N3	Bi	10.71	1
			N3	N4	Bi	25.51	1
			N4	N5	Bi	35.01	1
			N5	N6	Bi	18.74	1
			N6	N7	Bi	6.96	1
			N7	N8	Bi	16.19	1
			N8	N9	Bi	6.71	1
			N9	N10	Bi	16.07	1
			N10	N11	Bi	14.06	1
			N11	N12	Bi	8.45	1
			N12	N13	Bi	7.57	1
			N13	N14	Bi	23.38	1
			N14	N15	Bi	34.19	1
			N15	N16	Bi	40.85	1
			N16	N17	Bi	22.88	1
			N17	N18	Bi	7.17	1
			N18	N19	Bi	7.57	1
			N19	N20	Bi	7.11	1
			N20	N21	Bi	28.45	1
			N21	N22	Bi	5.87	1
			N22	N23	Bi	20.91	1
			N23	N24	Bi	24.82	1
			N24	N25	Bi	34.14	1
			N25	N26	Bi	26.71	1

Interfaces

Net	Node	Location
Net1	N1	tanur
	N2	quene_tanur
	N3	gudang_besi
	N4	packing_A
	N5	rusak_1
	N6	sisa1
	N7	penghalusan_A
	N8	Buffer_pembersihan_A
	N9	pembersihan_A
	N10	queue_pembersihan_A
	N11	buffer_pencetakan_A
	N12	pencetakan_A
	N13	buffer_cetakan_A
	N14	cetakan_A
	N15	gudang_pasir
	N16	cetakan_B
	N17	buffer_cetakan_B
	N18	pencetakan_B
	N19	buffer_pencetakan_B
	N20	queue_pembersihan_B
	N21	pembersihan_B
	N22	buffer_pembersihan_B
	N23	penghalusan_B
	N24	sisa2
	N25	rusak_2
	N26	packing_B

Resources

Name	Units	Stats	Res Search	Ent Search	Path	Motion	Cost
Operator1	1	By Unit	Closest	Oldest	Net1 Home: N1 (Return)	Empty: 50 mpm Full: 50 mpm	
Operator2	2	By Unit	Closest	Oldest	Net1 Home: N7 (Return)	Empty: 50 mpm Full: 50 mpm	
Operator4	2	By Unit	Least Used	Oldest	Net1 Home: N12 (Return)	Empty: 50 mpm Full: 50 mpm	
Operator5	2	By Unit	Least Used	Oldest	Net1 Home: N14 (Return)	Empty: 50 mpm Full: 50 mpm	
Operator6	4	By Unit	Least Used	Oldest	Net1 Home: N16 (Return)	Empty: 50 mpm Full: 50 mpm	
Operator7	2	By Unit	Closest	Oldest	Net1 Home: N18 (Return)	Empty: 50 mpm Full: 50 mpm	
operator9	3	By Unit	Closest	Oldest	Net1 Home: N26 (Return)	Empty: 50 mpm Full: 50 mpm	

Processing

		Process		Routing			
Entity	Location	Operation	Blk	Output	Destination	Rule	Move Logic
besi	gudang_besi		1	besi	quene_tanur	FIRST 1	
besi	quene_tanur		1	besi	tanur	FIRST 1	
besi	tanur	USE Operator1 FOR 1.242 FREE Operator1					
			1	besi_tuang	queue_pencetakan_A	0.300000 1	
				besi_tuang	queue_pencetakan_B	0.700000	
besi_tuang	queue_pencetakan_A		1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	pencetakan_A	COMBINE 7 AS besi_tuang					
			1	besi_tuang	pencetakan_A	FIRST 1	
besi_tuang	queue_pencetakan_B		1	besi_tuang	pencetakan_B	FIRST 1	
besi_tuang	pencetakan_B	COMBINE 10 AS besi_tuang					
			1	besi_tuang	pencetakan_B	FIRST 1	
pasir	gudang_pasir		1	pasir	cetakan_A	0.360000 1	MOVE WITH Operators THEN FREE ps1 = ps1 + 1

				pasir	cetakan_B	0.640000	MOVE WITH Operator6 THEN FREE ps2 = ps2 + 1
pasir	cetakan_A	GROUP 5 USE Operator5 FOR T(139, 152, 161) FREE Operator5					
			1	pasir	buffer_cetakan_A	FIRST 1	MOVE WITH Operator5 THEN FREE ps1 = ps1 - 5
pasir	buffer_cetakan_A		1	pasir	pencetakan_A	LOAD 1	MOVE WITH Operator5 THEN FREE
pasir	cetakan_B	GROUP 5 USE Operator6 FOR U(147, 157) FREE Operator6					
			1	pasir	buffer_cetakan_B	FIRST 1	MOVE WITH Operator6 THEN FREE ps2 = ps2 - 5
pasir	buffer_cetakan_B		1	pasir	pencetakan_B	LOAD 1	MOVE WITH Operator6 THEN FREE
besi_tuang	pencetakan_A	LOAD 1 USE Operator4 FOR T(19, 21.2, 24) USE Operator4 FOR E(9, 1.67) FREE Operator4 WAIT U(27, 35)					
			1	produk_A	buffer_pencetakan_A	0.962000 1	MOVE WITH Operator4 THEN FREE ct1 = ct1 + 1
				produk_A	rusak_1	0.038000	MOVE WITH Operator4 THEN FREE
produk_A	rusak_1	var1 = var1 + 1	1	besi	tanur	FIRST 1	
produk_A	buffer_pencetakan_A		1	produk_A	queue_pembersihan_A	FIRST 1	ct1 = ct1 - 1
besi_tuang	pencetakan_B	LOAD 1 USE Operator7 FOR U(10, 14) USE Operator7 FOR U(18, 22) FREE Operator7 WAIT U(26, 35)					
			1	produk_B	buffer_pencetakan_B	0.962000 1	MOVE WITH Operator7 THEN FREE ct2 = ct2 + 1
				produk_B	rusak_2	0.038000	MOVE WITH Operator7 THEN FREE
produk_B	rusak_2	var2 = var2 + 1	1	besi	tanur	FIRST 1	
produk_B	buffer_pencetakan_B		1	produk_B	queue_pembersihan_B	FIRST 1	ct2 = ct2 - 1
produk_A	queue_pembersihan_A		1	produk_A	pembersihan_A	FIRST 1	MOVE WITH Operator4 THEN FREE cl1 = cl1 + 1

ALL	pembersihan_A	GROUP 30 WAIT 1220.4					
			1	group_A	Buffer_pembersihan_A	FIRST 1	MOVE WITH Operator2 THEN FREE cl1 = cl1 - 30 bf1 = bf1 + 30
group_A	Buffer_pembersihan_A	UNGROUP					
ALL	Buffer_pembersihan_A		1	produk_A	penghalusan_A	FIRST 1	MOVE WITH Operator2 THEN FREE bf1 = bf1 - 1 hls1 = hls1 + 1
produk_B	queue_pembersihan_B		1	produk_B	pembersihan_B	FIRST 1	MOVE WITH Operator9 THEN FREE cl2 = cl2 + 1
ALL	pembersihan_B	GROUP 30 WAIT 1220.4					
			1	group_B	buffer_pembersihan_B	FIRST 1	MOVE WITH Operator9 THEN FREE cl2 = cl2 - 30 bf2 = bf2 + 30
group_B	buffer_pembersihan_B	UNGROUP					
ALL	buffer_pembersihan_B		1	produk_B	penghalusan_B	FIRST 1	MOVE WITH Operator9 THEN FREE bf2 = bf2 - 1 hls2 = hls2 + 1
produk_A	penghalusan_A	USE Operator2 FOR U(5.26, 5.89) FREE Operator2					
			1	produk_akhir_A	packing_A	0.948200 1	MOVE WITH Operator2 THEN FREE hls1 = hls1 - 1
				produk_akhir_A	sisa1	0.051800	MOVE WITH Operator2 THEN FREE hls1 = hls1 - 1
produk_akhir_A	sisa1		1	besi	tanur	FIRST 1	
ALL	packing_A	GROUP 30 USE Operator2 FOR U(1.15, 1.29) FREE Operator2 pck1 = pck1 + 1	1	produk_akhir_A	EXIT	FIRST 1	
produk_B	penghalusan_B	USE Operator9 FOR U(5.26, 5.65) FREE Operator9					
			1	produk_akhir_B	packing_B	0.948200 1	MOVE WITH Operator9 THEN FREE hls2 = hls2 - 1
				produk_akhir_B	sisa2	0.051800	MOVE WITH Operator9 THEN FREE hls2 = hls2 - 1

```
produk_akhir_B sisa2                                    1   besi            tanur                   FIRST 1
ALL            packing_B          GROUP 30
                                  USE Operator2 FOR U(1.47, 1.60)

                                  FREE Operator2
                                  pck2 = pck2 + 1
                                                        1   produk_akhir_B EXIT                    FIRST 1
```

Arrivals

Entity	Location	Qty each	First Time	Occurrences	Frequency	Logic
besi	gudang_besi	3000	0	20	86400	
pasir	gudang_pasir	25920	0	1		
pasir	buffer_cetakan_A	538	0	1		
pasir	buffer_cetakan_B	1300	0	1		

Shift Assignments

Locations	Resources	Shift Files	Priorities	Disable	Logic
	Operator1	C:\DOCUME~1\AMO235~1.GUN\Datak	99,99,99,99	No	
	Operator2				

Variables (global)

ID	Type	Initial value	Stats
ct1	Integer	0	Time Series
ct2	Integer	0	Time Series
cl1	Integer	0	Time Series
cl2	Integer	0	Time Series
hls1	Integer	0	Time Series
hls2	Integer	0	Time Series
pck1	Integer	0	Time Series
pck2	Integer	0	Time Series
ps1	Integer	0	Time Series
ps2	Integer	0	Time Series
Var1	Integer	0	Time Series
Var2	Integer	0	Time Series
bf1	Integer	0	Time Series
bf2	Integer	0	Time Series

External Files

ID	Type	File Name	Prompt
(null)	Shift	C:\DOCUME~1\AMO235~1.GUN\Dataku\Doc. Felisitas\TA\Disket\new...sft	

Lampiran F

Output hasil simulasi (general report)

Bulan I dengan jumlah operator 8 orang (untuk sistem kerja baru)

General Report
Output from C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\TA 1.MOD
Date: Jun/08/2005 Time: 10:25:30 AM

Scenario : Normal Run
Replication : 1 of 1
Simulation Time : 464 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Seconds Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
tanur	464	3000	60495	14542.190137	526.658	3000	0	17.56
gudang pasir	464	999999	25920	819369.169057	12714.3	25915	334	1.27
gudang besi	464	999999	60000	0.000000	0	1	0	0.00
cetakan A	464	5	9065	863.975713	4.68866	5	5	93.77
cetakan B.1	464	5	8836	794.234397	4.2013	5	1	84.03
cetakan B.2	464	5	7685	981.278618	4.51456	5	0	90.29
cetakan B	928	10	16521	881.240924	4.35793	0	1	87.16
pencetakan A	464	999999	25142	18949.800879	285.223	960	862	0.03
pencetakan B	464	999999	42344	697.754865	17.6878	350	5	0.00
pembersihan A	464	30	2190	13331.457731	17.4784	30	30	58.26
pembersihan B	464	30	3480	9116.930681	18.9936	30	30	63.31
penghalusan A	464	1	2160	209.547981	0.270967	1	0	27.10
penghalusan B	464	1	3450	78.504055	0.16214	1	0	16.21
packing A	464	30	2065	11551.899588	14.2808	30	25	47.60
packing B	464	30	3272	7035.657488	13.7815	30	2	45.94
queue pencetakan A	464	999999	22000	10.400000	0.136973	14	0	0.00
queue pencetakan B	464	999999	38495	9.310000	0.214552	16	0	0.00
queue pembersihan A	464	999999	2194	16871.954836	22.1606	368	4	0.00
queue pembersihan B	464	999999	3719	25012.065641	55.6872	366	239	0.01
quene tanur	464	999999	60000	152.673554	5.48396	3000	0	0.00
rusak 1	464	1	92	6.392391	0.000352071	1	0	0.04
rusak 2	464	1	130	0.032077	2.49641e-06	1	0	0.00
sisa1	464	1	95	0.000000	0	1	0	0.00
sisa2	464	1	178	3.662079	0.000390236	1	0	0.04
buffer pencetakan B	464	999999	3719	0.000000	0	1	0	0.00
buffer pencetakan A	464	999999	2194	0.000000	0	1	0	0.00
buffer pembersihan B	464	999999	115	4956.918174	0.341263	2	0	0.00
Buffer pembersihan A	464	999999	72	9449.005278	0.407285	3	0	0.00
buffer cetakan A	464	500	2287	58945.920975	80.7048	475	0	16.14
buffer cetakan B	464	1000	4159	262095.633335	652.572	869	310	65.26

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down
tanur	464	71.01	12.79	16.20	0.00
gudang pasir	464	0.00	100.00	0.00	0.00
gudang besi	464	100.00	0.00	0.00	0.00
cetakan A	464	3.62	6.94	89.44	0.00
cetakan B.1	464	9.29	14.40	76.31	0.00
cetakan B.2	464	5.36	12.61	82.03	0.00
cetakan B	928	7.33	13.50	79.17	0.00
pencetakan A	464	0.12	99.88	0.00	0.00
pencetakan B	464	8.17	91.83	0.00	0.00
pembersihan A	464	1.51	86.27	12.22	0.00
pembersihan B	464	0.79	75.89	23.32	0.00
packing A	464	8.66	90.77	0.57	0.00
packing B	464	8.55	90.33	1.12	0.00
queue pencetakan A	464	97.45	2.55	0.00	0.00
queue pencetakan B	464	97.39	2.61	0.00	0.00

queue pembersihan A	464	52.65	47.35	0.00	0.00
queue pembersihan B	464	52.39	47.61	0.00	0.00
quene tanur	464	99.35	0.65	0.00	0.00
buffer pencetakan B	464	100.00	0.00	0.00	0.00
buffer pencetakan A	464	100.00	0.00	0.00	0.00
buffer pembersihan B	464	67.31	32.69	0.00	0.00
Buffer pembersihan A	464	61.05	38.95	0.00	0.00
buffer cetakan A	464	62.02	37.98	0.00	0.00
buffer cetakan B	464	0.00	100.00	0.00	0.00

LOCATION STATES BY PERCENTAGE (single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down
penghalusan A	464	0.68	0.00	72.90	26.21	0.21	0.00
penghalusan B	464	1.08	0.00	83.79	15.13	0.00	0.00
rusak 1	464	0.00	0.00	99.96	0.00	0.04	0.00
rusak 2	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa1	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa2	464	0.00	0.00	99.96	0.00	0.04	0.00

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Seconds Per Usage	Average Seconds Travel To Use	Average Seconds Travel To Park	% Blocked In Travel	% Util
Operator1.1	1	132.4232306	38477	6.797864	3.104201	25.024416	0.00	79.92
Operator1.2	1	132.4722389	37688	6.532061	3.074656	24.408423	0.00	75.92
Operator1	2	264.8954694	76165	6.666340	3.089581	24.725088	0.00	77.92
Operator2.1	1	132.5021222	8291	32.188713	17.220802	18.920606	0.00	85.88
Operator2.2	1	132.4840889	8199	31.993487	17.005046	19.211148	0.00	84.23
Operator2.3	1	132.4404667	8482	30.778545	16.670243	18.798411	0.00	84.41
Operator2.4	1	132.4292667	8458	29.322862	16.757287	19.107325	0.00	81.75
Operator2.5	1	132.4471417	8525	29.206793	16.098516	19.193743	0.00	81.00
Operator2	5	662.3030861	41955	30.681814	16.745847	19.047693	0.00	83.46
Operator3	1	132.2604917	25601	9.713162	5.382899	11.220172	0.00	81.17

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down
Operator1.1	132.4232306	54.87	25.05	8.63	11.45	0.00
Operator1.2	132.4722389	51.62	24.30	7.95	16.13	0.00
Operator1	264.8954694	53.24	24.68	8.29	13.79	0.00
Operator2.1	132.5021222	55.95	29.93	6.80	7.32	0.00
Operator2.2	132.4840889	55.00	29.23	7.12	8.65	0.00
Operator2.3	132.4404667	54.75	29.66	7.29	8.29	0.00
Operator2.4	132.4292667	52.02	29.73	7.55	10.70	0.00
Operator2.5	132.4471417	52.22	28.78	7.66	11.34	0.00
Operator2	662.3030861	53.99	29.47	7.29	9.26	0.00
Operator3	132.2604917	52.23	28.94	0.14	18.69	0.00

FAILED ARRIVALS

Entity Name	Location Name	Total Failed
besi	gudang besi	0
pasir	gudang pasir	0
pasir	buffer cetakan A	0
pasir	buffer cetakan B	0

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Seconds In System	Average Seconds In Move Logic	Average Seconds Wait For Res, etc.	Average Seconds In Operation	Average Seconds Blocked
besi	0	1	-	-	-	-	-
pasir	28388	3997	811507.215449	3219.052345	37577.318776	1383.811784	769327.032543
besi tuang	60523	855	14998.936997	13.901598	14937.260326	21.965110	25.809963
produk A	0	19	-	-	-	-	-
produk akhir A	2139	20	133029.582679	1565.180799	127038.300645	1253.221351	3172.879883
produk B	0	254	-	-	-	-	-
produk akhir B	3348	19	45225.615684	2602.119274	38398.522031	1249.342369	2975.632010
group A	74	0	2046.647027	826.247027	0.000000	1220.400000	0.000000
group B	115	0	2089.324174	868.924174	0.000000	1220.400000	0.000000

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
pasir	0.40	4.63	0.17	94.80
besi tuang	0.09	99.59	0.15	0.17
produk akhir A	1.18	95.50	0.94	2.39
produk akhir B	5.75	84.90	2.76	6.58
group A	40.37	0.00	59.63	0.00
group B	41.59	0.00	58.41	0.00

VARIABLES

Variable Name	Total Changes	Average Seconds Per Change	Minimum Value	Maximum Value	Current Value	Average Value
ct1	4462	374.342896	0	1	0	0
ct2	7372	224.589915	0	1	0	0
cl1	2305	724.678256	0	30	11	17.2227
cl2	3595	464.605232	0	30	30	17.5111
hls1	4423	377.658818	0	2	1	0.205894
hls2	6866	243.284382	0	1	0	0.165226
pck1	69	24100.303913	0	69	69	38.7324
pck2	108	15448.034630	0	108	108	55.4303
ps1	11033	151.383455	0	5	5	4.59865
ps2	19825	84.231753	0	10	1	8.15662
var1	87	19025.439425	0	87	87	51.3664
var2	155	10682.357355	0	155	155	71.2557
bf1	2286	730.702078	0	32	8	4.45163
bf2	3548	470.793362	0	50	17	6.33891

Bulan I dengan jumlah operator 9 orang (untuk sistem kerja baru)

```
-------------------------------------------------------------------------------
General Report
Output from C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\1.8.MOD
Date: Jun/09/2005    Time: 05:58:36 AM
-------------------------------------------------------------------------------
Scenario          : Normal Run
Replication       : 1 of 1
Simulation Time   : 464 hr
-------------------------------------------------------------------------------
```

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Seconds Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
tanur	464	3000	60524	14539.297651	526.806	3000	0	17.56
gudang pasir	464	999999	25920	822368.871437	12760.9	25915	309	1.28
gudang besi	464	999999	60000	0.000000	0	1	0	0.00
cetakan A	464	5	9090	775.653361	4.22096	5	5	84.42
cetakan B.1	464	5	8751	851.729013	4.46209	5	1	89.24
cetakan B.2	464	5	7770	941.805644	4.38088	5	0	87.62
cetakan B	928	10	16521	894.092999	4.42149	0	1	88.43
pencetakan A	464	999999	25269	19934.506255	301.56	991	895	0.03
pencetakan B	464	999999	42254	338.219023	8.5555	235	3	0.00
pembersihan A	464	30	2190	12922.603251	16.9423	30	30	56.47
pembersihan B	464	30	3630	7439.870347	16.1678	30	30	53.89
penghalusan A	464	1	2160	267.121616	0.345416	1	0	34.54
penghalusan B	464	1	3599	46.333876	0.0998298	1	1	9.98
packing A	464	30	2048	12323.990088	15.1099	30	8	50.37
packing B	464	30	3419	7702.367976	15.7653	30	29	52.55
queue pencetakan A	464	999999	22111	10.400000	0.137664	15	0	0.00
queue pencetakan B	464	999999	38413	9.310000	0.214095	16	0	0.00
queue pembersihan A	464	999999	2191	14399.278809	18.887	349	1	0.00
queue pembersihan B	464	999999	3685	9402.527265	20.7425	357	55	0.00
quene tanur	464	999999	60000	152.857567	5.49057	3000	0	0.00
rusak 1	464	1	77	7.818701	0.0003604 17	1	0	0.04
rusak 2	464	1	156	0.055192	5.15445e-06	1	0	0.00
sisa1	464	1	112	0.000000	0	1	0	0.00
sisa2	464	1	179	0.000000	0	1	0	0.00
buffer pencetakan B	464	999999	3685	0.000000	0	1	0	0.00
buffer pencetakan A	464	999999	2191	0.000000	0	1	0	0.00
buffer pembersihan B	464	999999	120	2683.666500	0.192792	2	1	0.00
Buffer pembersihan A	464	999999	72	12293.962222	0.529912	3	0	0.00
buffer cetakan A	464	500	2269	53708.923451	72.9559	452	0	14.59
buffer cetakan B	464	1000	4138	250394.897610	620.291	841	297	62.03

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down
tanur	464	67.55	16.24	16.21	0.00
gudang pasir	464	0.00	100.00	0.00	0.00
gudang besi	464	100.00	0.00	0.00	0.00
cetakan A	464	6.76	19.02	74.22	0.00
cetakan B.1	464	3.27	15.19	81.54	0.00
cetakan B.2	464	8.06	9.42	82.52	0.00
cetakan B	928	5.67	12.30	82.03	0.00
pencetakan A	464	8.91	91.09	0.00	0.00
pencetakan B	464	6.70	93.30	0.00	0.00
pembersihan A	464	5.99	78.84	15.17	0.00
pembersihan B	464	0.41	84.66	14.93	0.00
packing A	464	4.99	94.46	0.55	0.00
packing B	464	7.87	91.02	1.11	0.00
queue pencetakan A	464	97.48	2.52	0.00	0.00
queue pencetakan B	464	97.37	2.63	0.00	0.00

queue pembersihan A	464	49.91	50.09	0.00	0.00
queue pembersihan B	464	76.59	23.41	0.00	0.00
quene tanur	464	99.34	0.66	0.00	0.00
buffer pencetakan B	464	100.00	0.00	0.00	0.00
buffer pencetakan A	464	100.00	0.00	0.00	0.00
buffer pembersihan B	464	80.92	19.08	0.00	0.00
buffer pembersihan A	464	53.00	47.00	0.00	0.00
buffer cetakan A	464	52.05	47.95	0.00	0.00
buffer cetakan B	464	0.00	100.00	0.00	0.00

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down
penghalusan A	464	0.68	0.00	65.46	33.65	0.22	0.00
penghalusan B	464	1.14	0.00	90.02	8.02	0.81	0.00
rusak 1	464	0.00	0.00	99.96	0.00	0.04	0.00
rusak 2	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa1	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa2	464	0.00	0.00	100.00	0.00	0.00	0.00

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Seconds Per Usage	Average Seconds Travel To Use	Average Seconds Travel To Park	% Blocked In Travel	% Util
Operator1.1	1	132.4496028	38009	6.784049	3.153908	25.032420	0.00	79.22
Operator1.2	1	132.3290972	38131	6.343368	3.051789	24.244472	0.00	75.20
Operator1	2	264.7787	76140	6.563355	3.102767	24.649830	0.00	77.21
Operator2.1	1	132.4089194	8288	32.201799	17.325376	18.884733	0.00	86.11
Operator2.2	1	132.4058944	8162	32.346652	17.263491	18.948013	0.00	84.95
Operator2.3	1	132.3527611	8375	30.917869	16.943362	19.297298	0.00	84.13
Operator2.4	1	132.5451	8518	29.923693	16.345389	19.232200	0.00	82.60
Operator2.5	1	132.4288889	8621	29.053485	16.028189	19.450927	0.00	81.52
Operator2	5	662.1415639	41964	30.864530	16.771686	19.167691	0.00	83.86
Operator3.1	1	132.3098861	13304	9.592837	6.639494	12.935305	0.00	45.34
Operator3.2	1	132.2648694	12878	9.736847	6.740728	12.883420	0.00	44.57
Operator3	2	264.5747556	26182	9.663670	6.689285	12.909376	0.00	44.95

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down
Operator1.1	132.4496028	54.08	25.14	9.07	11.71	0.00
Operator1.2	132.3290972	50.77	24.43	8.30	16.50	0.00
Operator1	264.7787	52.43	24.78	8.68	14.11	0.00
Operator2.1	132.4089194	55.99	30.12	7.05	6.84	0.00
Operator2.2	132.4058944	55.39	29.56	7.12	7.93	0.00
Operator2.3	132.3527611	54.34	29.78	7.25	8.62	0.00
Operator2.4	132.5451	53.42	29.18	7.55	9.85	0.00
Operator2.5	132.4288889	52.54	28.98	7.84	10.64	0.00
Operator2	662.1415639	54.34	29.53	7.36	8.78	0.00
Operator3.1	132.3098861	26.79	18.55	5.03	49.63	0.00
Operator3.2	132.2648694	26.33	18.23	5.01	50.43	0.00
Operator3	264.5747556	26.56	18.39	5.02	50.03	0.00

FAILED ARRIVALS

Entity Name	Location Name	Total Failed
besi	gudang besi	0
pasir	gudang pasir	0
pasir	buffer cetakan A	0
pasir	buffer cetakan B	0

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Seconds In System	Average Seconds In Move Logic	Average Seconds Wait For Res, etc.	Average Seconds In Operation	Average Seconds Blocked
besi	0	0	-	-	-	-	-
pasir	29547	2795	818578.143959	2413.438133	25138.562556	1386.743204	789639.400066
besi tuang	60537	855	14872.028384	7.669261	14832.505369	22.118385	9.735370
produk A	0	22	-	-	-	-	-
produk akhir A	2139	5	138151.383974	2369.783983	132219.722263	1253.052118	2308.825610
produk B	0	95	-	-	-	-	-
produk akhir B	3503	23	24723.723625	995.645133	21675.269158	1249.448730	803.360605
group A	73	0	2971.530137	1751.130137	0.000000	1220.400000	0.000000
group B	120	0	1652.390750	431.990750	0.000000	1220.400000	0.000000

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
pasir	0.29	3.07	0.17	96.46
besi tuang	0.05	99.73	0.15	0.07
produk akhir A	1.72	95.71	0.91	1.67
produk akhir B	4.03	87.67	5.05	3.25
group A	58.93	0.00	41.07	0.00
group B	26.14	0.00	73.86	0.00

VARIABLES

Variable Name	Total Changes	Average Seconds Per Change	Minimum Value	Maximum Value	Current Value	Average Value
ct1	4424	377.530262	0	1	0	0
ct2	7388	226.090240	0	1	0	0
cl1	2285	730.966057	0	30	22	14.4516
cl2	3750	445.287293	0	30	30	15.8535
hls1	4380	380.808941	0	2	0	0.11011
hls2	7200	231.997640	0	2	0	0.105648
pck1	69	24169.659420	0	69	69	38.6366
pck2	113	14772.736018	0	113	113	56.4816
ps1	11003	151.803796	0	5	5	4.00512
ps2	19804	84.345160	0	10	10	9.02232
Var1	81	20401.280617	0	81	81	50.67
Var2	161	10316.102547	0	161	161	84.4474
bf1	2263	737.035210	0	30	0	3.10775
bf2	3720	449.022022	0	46	0	1.7433

Bulan I dengan jumlah operator 10 orang (untuk sistem kerja baru)

General Report
Output from C:\DOCUME~1\AM0235~1.GUN\DATAKU\DOC. FELISITAS\FINAL\1.9.MOD
Date: Jun/09/2005 Time: 06:15:46 AM

scenario : Normal Run
Replication : 1 of 1
Simulation Time : 464 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Seconds Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
tanur	464	3000	60563	14671.632907	531.943	3000	0	17.73
gudang pasir	464	999999	25920	816128.270291	12664.1	25915	300	1.27
gudang besi	464	999999	60000	0.000000	0	1	0	0.00
cetakan A	464	5	9099	675.234275	3.67813	5	4	73.56
cetakan B.1	464	5	8674	793.889858	4.12249	5	4	82.45
cetakan B.2	464	5	7847	873.219969	4.10211	5	2	82.04
cetakan B	928	10	16521	831.569380	4.1123	6	6	82.25
pencetakan A	464	999999	25174	18646.667849	281.017	948	850	0.03
pencetakan B	464	999999	42388	243.976765	6.19114	128	5	0.00
pembersihan A	464	30	2214	14820.526332	19.6436	30	24	65.48
pembersihan B	464	30	3642	9379.806002	20.4509	30	12	68.17
penghalusan A	464	1	2190	257.107963	0.337085	1	0	33.71
penghalusan B	464	1	3611	29.798552	0.06441?2	1	1	6.44
packing A	464	30	2060	9755.786359	12.0312	30	20	40.10
packing B	464	30	3425	6271.799001	12.8597	30	5	42.87
queue pencetakan A	464	999999	22028	10.400000	0.137148	16	0	0.00
queue pencetakan B	464	999999	38535	9.310000	0.214775	16	0	0.00
queue pembersihan A	464	999999	2214	24474.687385	32.4398	424	0	0.00
queue pembersihan B	464	999999	3693	8385.737696	18.5396	351	51	0.00
quene tanur	464	999999	60000	154.424651	5.54686	3000	0	0.00
rusak 1	464	1	88	6.715568	0.00035379	1	0	0.04
rusak 2	464	1	160	0.544562	5.21612e-05	1	0	0.01
sisa1	464	1	130	0.000000	0	1	0	0.00
sisa2	464	1	185	0.000000	0	1	0	0.00
buffer pencetakan B	464	999999	3693	0.000000	0	1	0	0.00
buffer pencetakan A	464	999999	2214	0.000000	0	1	0	0.00
buffer pembersihan B	464	999999	121	1583.263636	0.114688	2	1	0.00
buffer pembersihan A	464	999999	73	11954.458219	0.522435	3	0	0.00
buffer cetakan A	464	500	2304	62352.885838	86.004	485	0	17.20
buffer cetakan B	464	1000	4170	267984.864588	669	896	317	66.90

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down
tanur	464	69.84	13.82	16.34	0.00
gudang pasir	464	0.00	100.00	0.00	0.00
gudang besi	464	100.00	0.00	0.00	0.00
cetakan A	464	22.16	7.56	70.27	0.00
cetakan B.1	464	5.95	17.44	76.61	0.00
cetakan B.2	464	13.35	9.66	76.98	0.00
cetakan B	928	9.65	13.55	76.80	0.00
pencetakan A	464	3.61	96.39	0.00	0.00
pencetakan B	464	13.77	86.23	0.00	0.00
pembersihan A	464	1.23	80.73	18.04	0.00
pembersihan B	464	0.34	86.46	13.20	0.00
packing A	464	13.26	86.07	0.67	0.00
packing B	464	5.26	93.60	1.13	0.00
queue pencetakan A	464	97.46	2.54	0.00	0.00
queue pencetakan B	464	97.36	2.64	0.00	0.00

queue pembersihan A	464	50.22	49.78	0.00	0.00
queue pembersihan B	464	78.76	21.24	0.00	0.00
quene tanur	464	99.24	0.76	0.00	0.00
buffer pencetakan B	464	100.00	0.00	0.00	0.00
buffer pencetakan A	464	100.00	0.00	0.00	0.00
buffer pembersihan B	464	88.54	11.46	0.00	0.00
Buffer pembersihan A	464	57.06	42.94	0.00	0.00
buffer cetakan A	464	42.44	57.56	0.00	0.00
buffer cetakan B	464	0.00	100.00	0.00	0.00

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down
penghalusan A	464	0.68	0.00	66.29	32.79	0.25	0.00
penghalusan B	464	1.12	0.00	93.56	4.39	0.93	0.00
rusak 1	464	0.00	0.00	99.96	0.00	0.04	0.00
rusak 2	464	0.00	0.00	99.99	0.00	0.01	0.00
sisa1	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa2	464	0.00	0.00	100.00	0.00	0.00	0.00

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Seconds Per Usage	Average Seconds Travel To Use	Average Seconds Travel To Park	% Blocked In Travel	% Util
Operator1.1	1	132.3613306	38115	6.826428	3.266520	25.210459	0.00	80.73
Operator1.2	1	132.4958028	38280	6.585771	3.027105	24.484578	0.00	77.15
Operator1	2	264.8571333	76395	6.705840	3.146555	24.853031	0.00	78.94
Operator2.1	1	132.549125	8189	33.317285	17.051103	18.781884	0.00	86.44
Operator2.2	1	132.4287611	8299	31.299335	17.303211	18.902885	0.00	84.61
Operator2.3	1	132.4736	8417	30.482575	16.738347	19.335388	0.00	83.34
Operator2.4	1	132.4490917	8450	30.029367	16.302908	19.180296	0.00	82.11
Operator2.5	1	132.3476833	8666	28.962647	16.014593	19.169470	0.00	81.81
Operator2	5	662.2482611	42021	30.791716	16.674048	19.077344	0.00	83.66
Operator3.1	1	132.25	9408	9.507689	8.016348	15.031944	0.00	34.63
Operator3.2	1	132.25	9138	9.403492	8.186224	15.241947	0.00	33.76
Operator3.3	1	132.25	7722	10.202400	7.088466	16.482983	0.00	28.05
Operator3	3	396.75	26268	9.675665	7.802662	15.449481	0.00	32.15

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down
Operator1.1	132.3613306	54.60	26.13	7.96	11.31	0.00
Operator1.2	132.4958028	52.85	24.29	7.49	15.36	0.00
Operator1	264.8571333	53.73	25.21	7.72	13.34	0.00
Operator2.1	132.549125	57.18	29.26	7.06	6.50	0.00
Operator2.2	132.4287611	54.48	30.12	7.26	8.13	0.00
Operator2.3	132.4736	53.80	29.54	7.52	9.13	0.00
Operator2.4	132.4490917	53.22	28.89	7.61	10.28	0.00
Operator2.5	132.3476833	52.68	29.13	7.66	10.53	0.00
Operator2	662.2482611	54.27	29.39	7.42	8.91	0.00
Operator3.1	132.25	18.79	15.84	6.69	58.68	0.00
Operator3.2	132.25	18.05	15.71	6.82	59.42	0.00
Operator3.3	132.25	16.55	11.50	4.45	67.51	0.00
Operator3	396.75	17.79	14.35	5.99	61.87	0.00

FAILED ARRIVALS

Entity Name	Location Name	Total Failed
besi	gudang besi	0
pasir	gudang pasir	0
pasir	buffer cetakan A	0
pasir	buffer cetakan B	0

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Seconds In System	Average Seconds In Move Logic	Average Seconds Wait For Res, etc.	Average Seconds In Operation	Average Seconds Blocked
besi	0	0	-	-	-	-	-
pasir	29449	2935	824900.048001	3373.173037	25134.320637	1388.121865	795004.432462
besi tuang	60534	836	14874.328850	9.878960	14833.610623	22.518103	8.321164
produk A	0	35	-	-	-	-	-
produk akhir A	2139	9	135458.730098	4633.627246	127249.077705	1252.775909	2323.249238
produk B	0	76	-	-	-	-	-
produk akhir B	3534	16	22695.109525	880.554375	19803.447954	1249.322640	761.784556
group A	73	1	4878.823562	3658.423562	0.000000	1220.400000	0.000000
group B	122	0	1872.056803	651.656803	0.000000	1220.400000	0.000000

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
pasir	0.41	3.05	0.17	96.38
besi tuang	0.07	99.73	0.15	0.06
produk akhir A	3.42	93.94	0.92	1.72
produk akhir B	3.88	87.26	5.50	3.36
group A	74.99	0.00	25.01	0.00
group B	34.81	0.00	65.19	0.00

VARIABLES

Variable Name	Total Changes	Average Seconds Per Change	Minimum Value	Maximum Value	Current Value	Average Value
ct1	4450	375.334373	0	1	0	0
ct2	7436	223.832402	0	1	0	0
cl1	2293	727.934963	0	30	30	18.3249
cl2	3794	440.270830	0	30	12	15.1316
hls1	4380	380.055406	0	2	0	0.150515
hls2	7283	229.355859	0	2	1	0.0760363
pck1	69	24117.889710	0	69	69	38.855
pck2	114	14638.296754	0	114	114	56.4829
ps1	10925	152.891225	0	5	5	4.58916
ps2	19825	84.124827	0	10	1	8.34425
Var1	84	19854.942500	0	84	84	48.99
Var2	136	12104.706103	0	136	136	71.5276
bf1	2263	735.577689	0	38	0	3.03763
bf2	3764	443.782869	0	41	18	1.63928

Bulan I dengan jumlah operator 11 orang (untuk sistem kerja baru)

General Report
Output from C:\DOCUME~1\AM0235~1.GUN\DATAKU\DOC. FELISITAS\FINAL\1.10.MOD
Date: Jun/09/2005 Time: 06:31:19 AM

Scenario : Normal Run
Replication : 1 of 1
Simulation Time : 464 hr

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Seconds Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
tanur	464	3000	60545	14684.696815	532.259	3000	0	17.74
gudang pasir	464	999999	25920	763455.049504	11846.7	25914	0	1.18
gudang besi	464	999999	60000	0.000000	0	1	0	0.00
cetakan A	464	5	9399	830.599987	4.67362	5	4	93.47
cetakan B.1	464	5	8591	832.927897	4.28381	5	1	85.68
cetakan B.2	464	5	7930	835.451966	3.9662	5	0	79.32
cetakan B	928	10	16521	834.139438	4.12501	0	1	82.50
pencetakan A	464	999999	25106	16182.815990	243.227	856	761	0.02
pencetakan B	464	999999	42434	279.683556	7.10494	116	7	0.00
pembersihan A	464	30	2278	15828.183358	21.5856	30	28	71.95
pembersihan B	464	30	3672	8032.408889	17.6575	30	12	58.86
penghalusan A	464	1	2250	218.161080	0.293859	1	0	29.39
penghalusan B	464	1	3639	27.394746	0.05968	1	0	5.97
packing A	464	30	2137	13692.782770	17.5176	30	7	58.39
packing B	464	30	3445	5552.658441	11.4517	30	25	38.17
queue pencetakan A	464	999999	21968	10.400000	0.136774	14	0	0.00
queue pencetakan B	464	999999	38577	9.310000	0.21501	16	0	0.00
queue pembersihan A	464	999999	2278	26903.180066	36.6891	452	0	0.00
queue pembersihan B	464	999999	3719	8314.003090	18.5104	347	47	0.00
quene tanur	464	999999	60000	151.654449	5.44736	3000	0	0.00
rusak 1	464	1	101	3.239505	0.000195875	1	0	0.02
rusak 2	464	1	138	0.209565	1.73132e-05	1	0	0.00
sisa1	464	1	113	0.000000	0	1	0	0.00
sisa2	464	1	193	0.000000	0	1	0	0.00
buffer pencetakan B	464	999999	3719	0.000000	0	1	0	0.00
buffer pencetakan A	464	999999	2278	0.000000	0	1	0	0.00
buffer pembersihan B	464	999999	122	1504.769426	0.109903	2	1	0.00
buffer pembersihan A	464	999999	75	12329.075333	0.553568	4	0	0.00
buffer cetakan A	464	500	2379	67553.865776	96.2109	500	0	19.24
buffer cetakan B	464	1000	4215	334832.764716	844.899	987	358	84.49

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down
tanur	464	69.30	14.41	16.29	0.00
gudang pasir	464	0.44	99.56	0.00	0.00
gudang besi	464	100.00	0.00	0.00	0.00
cetakan A	464	2.93	12.98	84.10	0.00
cetakan B.1	464	3.02	16.11	80.87	0.00
cetakan B.2	464	15.87	11.24	72.89	0.00
cetakan B	928	9.44	13.67	76.88	0.00
pencetakan A	464	0.00	100.00	0.00	0.00
pencetakan B	464	5.68	94.32	0.00	0.00
pembersihan A	464	1.75	79.13	19.12	0.00
pembersihan B	464	0.33	89.05	10.61	0.00
packing A	464	5.24	94.06	0.70	0.00
packing B	464	5.03	93.87	1.10	0.00
queue pencetakan A	464	97.45	2.55	0.00	0.00
queue pencetakan B	464	97.32	2.68	0.00	0.00

queue pembersihan A	464	69.08	30.92	0.00	0.00
queue pembersihan B	464	81.08	18.92	0.00	0.00
quene tanur	464	99.26	0.74	0.00	0.00
buffer pencetakan B	464	100.00	0.00	0.00	0.00
buffer pencetakan A	464	100.00	0.00	0.00	0.00
buffer pembersihan B	464	89.03	10.97	0.00	0.00
Buffer pembersihan A	464	59.22	40.78	0.00	0.00
buffer cetakan A	464	52.72	47.27	0.01	0.00
buffer cetakan B	464	0.00	100.00	0.00	0.00

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down
penghalusan A	464	0.70	0.00	70.61	28.42	0.26	0.00
penghalusan B	464	1.14	0.00	94.03	3.89	0.94	0.00
rusak 1	464	0.00	0.00	99.98	0.00	0.02	0.00
rusak 2	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa1	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa2	464	0.00	0.00	100.00	0.00	0.00	0.00

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Seconds Per Usage	Average Seconds Travel To Use	Average Seconds Travel To Park	% Blocked In Travel	% Util
Operator1.1	1	132.3836139	39051	6.845519	3.092170	24.058484	0.00	81.43
Operator1.2	1	132.4395722	37805	6.810370	3.077440	23.013718	0.00	78.40
Operator1	2	264.8231861	76856	6.828229	3.084925	23.552010	0.00	79.92
Operator2.1	1	132.4870444	7130	33.663238	16.595164	19.389474	0.00	75.13
Operator2.2	1	132.5041556	7056	31.585207	16.538543	19.269640	0.00	71.18
Operator2.3	1	132.3834278	7090	32.028142	15.603093	18.821192	0.00	70.86
Operator2.4	1	132.46385	6973	29.950840	15.438443	18.947627	0.00	66.37
Operator2.5	1	132.3686111	7228	29.503471	14.084768	19.164392	0.00	66.11
Operator2.6	1	132.4366556	7045	28.116886	13.361259	19.313917	0.00	61.29
Operator2	6	794.6437444	42522	30.811001	15.268154	19.151343	0.00	68.49
Operator3.1	1	132.25	9434	9.386649	7.924345	15.117357	0.00	34.30
Operator3.2	1	132.25	9240	9.554342	7.909447	15.020563	0.00	33.89
Operator3.3	1	132.25	7722	10.344934	7.096731	16.504340	0.00	28.29
Operator3	3	396.75	26396	9.725691	7.677003	15.406311	0.00	32.16

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down
Operator1.1	132.3836139	56.09	25.34	7.26	11.31	0.00
Operator1.2	132.4395722	54.00	24.40	6.53	15.07	0.00
Operator1	264.8231861	55.05	24.87	6.89	13.19	0.00
Operator2.1	132.4870444	50.32	24.81	11.29	13.58	0.00
Operator2.2	132.5041556	46.72	24.46	10.98	17.83	0.00
Operator2.3	132.3834278	47.65	23.21	11.03	18.11	0.00
Operator2.4	132.46385	43.80	22.57	11.12	22.51	0.00
Operator2.5	132.3686111	44.75	21.36	11.47	22.41	0.00
Operator2.6	132.4366556	41.55	19.74	11.77	26.94	0.00
Operator2	794.6437444	45.80	22.69	11.28	20.23	0.00
Operator3.1	132.25	18.60	15.70	6.73	58.97	0.00
Operator3.2	132.25	18.54	15.35	6.56	59.55	0.00
Operator3.3	132.25	16.78	11.51	4.46	67.24	0.00
Operator3	396.75	17.97	14.19	5.92	61.92	0.00

FAILED ARRIVALS

Entity Name	Location Name	Total Failed
besi	gudang besi	0
pasir	gudang pasir	0
pasir	buffer cetakan A	0
pasir	buffer cetakan B	0

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Seconds In System	Average Seconds In Move Logic	Average Seconds Wait For Res, etc.	Average Seconds In Operation	Average Seconds Blocked
besi	0	0	-	-	-	-	-
pasir	29287	3233	829934.075471	3523.964586	27272.318845	1388.436822	797749.355218
besi tuang	60542	737	14884.736990	8.486427	14843.411467	22.674253	10.164842
produk A	0	16	-	-	-	-	-
produk akhir A	2232	29	109134.499359	3671.934462	102056.295515	1252.497648	2153.771734
produk B	0	125	-	-	-	-	-
produk akhir B	3472	27	26651.251437	1738.001149	22768.861987	1249.687313	894.700988
group A	77	0	3846.063506	2625.663506	0.000000	1220.400000	0.000000
group B	120	0	2423.575167	1203.175167	0.000000	1220.400000	0.000000

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
pasir	0.42	3.29	0.17	96.12
besi tuang	0.06	99.72	0.15	0.07
produk akhir A	3.36	93.51	1.15	1.97
produk akhir B	6.52	85.43	4.69	3.36
group A	68.27	0.00	31.73	0.00
group B	49.64	0.00	50.36	0.00

VARIABLES

variable Name	Total Changes	Average Seconds Per Change	Minimum Value	Maximum Value	Current Value	Average Value
ct1	4652	357.145589	0	1	0	0
ct2	7448	223.438551	0	1	0	0
cl1	2403	691.430707	0	30	16	21.6015
cl2	3750	445.159331	0	30	30	19.1113
hls1	4620	359.578771	0	2	0	0.0901639
hls2	7200	231.923710	0	2	0	0.112107
pck1	72	22951.011806	0	72	72	40.33
pck2	112	14899.006875	0	112	112	56.4656
ps1	11278	147.302416	0	5	4	4.46756
ps2	19825	74.552921	0	10	1	7.58031
var1	84	19658.354643	0	84	84	49.8089
var2	135	12211.183481	0	135	135	72.5793
bf1	2387	695.952731	0	30	0	2.9688
bf2	3720	448.874968	0	47	0	1.89165

Bulan I dengan jumlah operator 17 (untuk sistem kerja lama)

```
General Report
Output from C:\DOCUME~1\AM0235~1.GUN\Dataku\Doc. Felisitas\Final\TA  LAMA.MOD
Date: Jun/08/2005    Time: 09:07:55 AM
-------------------------------------------------------------------------------
Scenario          : Normal Run
Replication       : 1 of 1
Simulation Time   : 464 hr
-------------------------------------------------------------------------------
```

LOCATIONS

Location Name	Scheduled Hours	Capacity	Total Entries	Average Seconds Per Entry	Average Contents	Maximum Contents	Current Contents	% Util
tanur	464	3000	60575	14980.085416	543.234	3000	0	18.11
gudang pasir	464	999999	25920	514808.500276	7988.41	25920	0	0.80
gudang besi	464	999999	60000	0.000000	0	1	0	0.00
cetakan A.1	464	5	4715	1011.642598	2.85554	5	0	57.11
cetakan A.2	464	5	4684	1453.582850	4.07602	5	4	81.52
cetakan A	928	10	9399	1231.883915	3.46578	0	4	69.32
cetakan B.1	464	5	5356	1032.922356	3.31198	5	1	66.24
cetakan B.2	464	5	5055	940.062307	2.84484	5	0	56.90
cetakan B.3	464	5	4045	1120.637958	2.71371	5	0	54.27
cetakan B.4	464	5	2065	2143.058906	2.64932	5	0	52.99
cetakan B	1856	20	16521	1164.744524	2.87996	0	1	57.60
pencetakan A	464	999999	21100	1748.971540	22.0925	257	223	0.00
pencetakan B	464	999999	46323	361.884948	10.0357	215	2	0.00
pembersihan A	464	30	2335	9559.301953	13.3626	30	25	44.54
pembersihan B	464	30	3771	8073.836184	18.227	30	21	60.76
penghalusan A.1	464	1	1546	472.462704	0.437277	1	0	43.73
penghalusan A.2	464	1	764	592.063717	0.270795	1	0	27.08
penghalusan A	928	2	2310	512.019056	0.354036	0	0	35.40
penghalusan B.1	464	1	1232	1064.233239	0.784923	1	0	78.49
penghalusan B.2	464	1	1080	1163.333852	0.752156	1	0	75.22
penghalusan B.3	464	1	938	1296.771652	0.728192	1	0	72.82
penghalusan B.4	464	1	500	2351.030300	0.703733	1	0	70.37
penghalusan B	1856	4	3750	1322.512765	0.742251	0	0	74.23
packing A	464	30	2167	14069.461772	18.2522	30	7	60.84
packing B.1	464	30	2909	14444.137150	25.1545	30	29	83.85
packing B.2	464	30	652	59029.724187	23.0408	30	22	76.80
packing B	928	60	3561	22607.518995	24.0976	0	51	80.33
queue pencetakan A	464	999999	18463	10.400000	0.114952	8	0	0.00
queue pencetakan B	464	999999	42112	9.310000	0.234712	8	0	0.00
queue pembersihan A	464	999999	2335	16698.266600	23.342	253	0	0.00
queue pembersihan B	464	999999	4051	23153.386613	56.1508	361	279	0.01
quene tanur	464	999999	60000	287.969527	10.3437	3002	0	0.00
rusak 1	464	1	83	0.015181	7.5431e-07	1	0	0.00
rusak 2	464	1	160	0.078375	7.50718e-06	1	0	0.00
sisa1	464	1	143	0.040909	3.50216e-06	1	0	0.00
sisa2	464	1	189	0.035165	3.98108e-06	1	0	0.00
buffer pencetakan B	464	999999	4051	0.000000	0	1	0	0.00
buffer pencetakan A	464	999999	2335	0.000000	0	1	0	0.00
buffer pembersihan B	464	999999	125	24054.335600	1.80004	8	0	0.00
Buffer pembersihan A	464	999999	77	22450.118182	1.03488	4	0	0.00
buffer cetakan A	464	600	2418	315013.120583	456	600	0	76.00
buffer cetakan B	464	1500	4246	468194.189357	1190.11	1500	35	79.34

LOCATION STATES BY PERCENTAGE (Multiple Capacity)

Location Name	Scheduled Hours	% Empty	% Partially Occupied	% Full	% Down
tanur	464	48.59	35.22	16.19	0.00
gudang pasir	464	30.85	69.15	0.00	0.00
gudang besi	464	100.00	0.00	0.00	0.00

cetakan A.1	464	38.81	9.28	51.91	0.00
cetakan A.2	464	8.26	40.15	51.60	0.00
cetakan A	928	23.54	24.71	51.75	0.00
cetakan B.1	464	2.79	41.56	55.65	0.00
cetakan B.2	464	37.67	10.75	51.58	0.00
cetakan B.3	464	40.64	12.80	46.57	0.00
cetakan B.4	464	39.88	21.43	38.69	0.00
cetakan B	1856	30.24	21.63	48.12	0.00
pencetakan A	464	7.92	92.08	0.00	0.00
pencetakan B	464	8.33	91.67	0.00	0.00
pembersihan A	464	13.06	69.57	17.37	0.00
pembersihan B	464	1.60	88.23	10.17	0.00
packing A	464	1.42	97.43	1.16	0.00
packing B.1	464	2.94	27.95	69.11	0.00
packing B.2	464	5.07	31.81	63.12	0.00
packing B	928	4.00	29.88	66.12	0.00
queue pencetakan A	464	95.67	4.33	0.00	0.00
queue pencetakan B	464	95.37	4.63	0.00	0.00
queue pembersihan A	464	66.64	33.36	0.00	0.00
queue pembersihan B	464	50.23	49.77	0.00	0.00
quene tanur	464	88.98	11.02	0.00	0.00
buffer pencetakan B	464	100.00	0.00	0.00	0.00
buffer pencetakan A	464	100.00	0.00	0.00	0.00
buffer pembersihan B	464	15.19	84.81	0.00	0.00
Buffer pembersihan A	464	37.20	62.80	0.00	0.00
buffer cetakan A	464	1.65	65.10	33.25	0.00
buffer cetakan B	464	0.00	67.60	32.40	0.00

LOCATION STATES BY PERCENTAGE (Single Capacity)

Location Name	Scheduled Hours	% Operation	% Setup	% Idle	% Waiting	% Blocked	% Down
penghalusan A.1	464	0.48	0.00	56.27	42.65	0.60	0.00
penghalusan A.2	464	0.24	0.00	72.92	26.13	0.72	0.00
penghalusan A	928	0.36	0.00	64.60	34.39	0.66	0.00
penghalusan B.1	464	0.39	0.00	21.51	15.05	63.05	0.00
penghalusan B.2	464	0.35	0.00	24.78	12.09	62.78	0.00
penghalusan B.3	464	0.31	0.00	27.18	10.17	62.34	0.00
penghalusan B.4	464	0.16	0.00	29.63	7.72	62.49	0.00
penghalusan B	1856	0.30	0.00	25.77	11.26	62.67	0.00
rusak 1	464	0.00	0.00	100.00	0.00	0.00	0.00
rusak 2	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa1	464	0.00	0.00	100.00	0.00	0.00	0.00
sisa2	464	0.00	0.00	100.00	0.00	0.00	0.00

RESOURCES

Resource Name	Units	Scheduled Hours	Number Of Times Used	Average Seconds Per Usage	Average Seconds Travel To Use	Average Seconds Travel To Park	% Blocked In Travel	% Util
Operator1	1	132.25	60575	1.240000	0.000000	0.000000	0.00	15.78
Operator2.1	1	132.4205972	3612	34.759003	41.553145	190.288673	0.00	57.82
Operator2.2	1	132.3428306	3584	32.677974	38.858557	78.212000	0.00	53.81
Operator2	2	264.7634278	7196	33.722538	40.211094	145.595521	0.00	55.82
Operator4.1	1	464	4730	48.294366	9.420059	45.983436	0.00	16.34
Operator4.2	1	464	4859	47.033865	9.136641	45.949897	0.00	16.34
Operator4	2	928	9589	47.655637	9.276444	45.966652	0.00	16.34
Operator5.1	1	464	7749	48.259783	30.971084	37.130000	0.00	36.76
Operator5.2	1	464	7826	47.607368	30.840535	37.080919	0.00	36.75
Operator5	2	928	15575	47.931963	30.905487	37.104986	0.00	36.75
Operator6.1	1	464	6755	52.010506	36.329930	36.050000	0.00	35.72
Operator6.2	1	464	6805	51.498169	36.274777	36.050000	0.00	35.76
Operator6.3	1	464	6904	50.561989	36.245056	36.050000	0.00	35.88
Operator6.4	1	464	6876	50.945097	36.159802	36.050000	0.00	35.86
Operator6	4	1856	27340	51.249249	36.251983	36.050000	0.00	35.80

Operator7.1	1	464	6483	14.654722	4.098880	40.503409	0.00	7.28
Operator7.2	1	464	6150	15.176356	4.647828	53.861538	0.00	7.30
Operator7	2	928	12633	14.908664	4.366119	45.465000	0.00	7.29
operator9.1	1	464	5355	39.384133	59.759744	133.783728	0.00	31.79
operator9.2	1	464	4830	41.711760	65.662199	134.312819	0.00	31.05
operator9.3	1	464	4962	40.937217	62.257461	134.234620	0.00	30.65
operator9	3	1392	15147	40.635129	62.459937	134.102855	0.00	31.16

RESOURCE STATES BY PERCENTAGE

Resource Name	Scheduled Hours	% In Use	% Travel To Use	% Travel To Park	% Idle	% Down
Operator1	132.25	15.78	0.00	0.00	84.22	0.00
Operator2.1	132.4205972	26.34	31.48	3.91	38.27	0.00
Operator2.2	132.3428306	24.58	29.23	1.07	45.12	0.00
Operator2	264.7634278	25.46	30.36	2.49	41.69	0.00
Operator4.1	464	13.68	2.67	1.60	82.06	0.00
Operator4.2	464	13.68	2.66	1.60	82.06	0.00
Operator4	928	13.68	2.66	1.60	82.06	0.00
Operator5.1	464	22.39	14.37	0.40	62.85	0.00
Operator5.2	464	22.30	14.45	0.41	62.84	0.00
Operator5	928	22.35	14.41	0.40	62.84	0.00
Operator6.1	464	21.03	14.69	0.58	63.70	0.00
Operator6.2	464	20.98	14.78	0.58	63.66	0.00
Operator6.3	464	20.90	14.98	0.64	63.48	0.00
Operator6.4	464	20.97	14.88	0.61	63.54	0.00
Operator6	1856	20.97	14.83	0.60	63.59	0.00
Operator7.1	464	5.69	1.59	0.21	92.51	0.00
Operator7.2	464	5.59	1.71	0.17	92.53	0.00
Operator7	928	5.64	1.65	0.19	92.52	0.00
operator9.1	464	12.63	19.16	5.35	62.86	0.00
operator9.2	464	12.06	18.99	5.11	63.85	0.00
operator9.3	464	12.16	18.49	4.87	64.48	0.00
operator9	1392	12.28	18.88	5.11	63.73	0.00

FAILED ARRIVALS

Entity Name	Location Name	Total Failed
besi	gudang besi	0
pasir	gudang pasir	0
pasir	buffer cetakan A	0
pasir	buffer cetakan B	0

ENTITY ACTIVITY

Entity Name	Total Exits	Current Quantity In System	Average Seconds In System	Average Seconds In Move Logic	Average Seconds Wait For Res, etc.	Average Seconds In Operation	Average Seconds Blocked
besi	0	0	-	-	-	-	-
pasir	30029	2555	906758.943972	3587.681889	50942.296033	1563.697142	850665.268908
besi tuang	60569	225	15844.404526	19.831025	15689.844723	23.256449	111.472330
produk A	0	25	-	-	-	-	-
produk akhir A	2232	7	65547.367944	5291.772513	43008.236438	1501.401895	15745.957097
produk B	0	301	-	-	-	-	-
produk akhir B	3627	51	74858.560168	1340.552393	52900.018095	1395.666159	19222.323521
group A	77	0	3776.954805	2556.554805	0.000000	1220.400000	0.000000
group B	125	0	1366.054080	145.654080	0.000000	1220.400000	0.000000

ENTITY STATES BY PERCENTAGE

Entity Name	% In Move Logic	% Wait For Res, etc.	% In Operation	% Blocked
pasir	0.17	4.51	0.15	95.16
besi tuang	0.05	99.28	0.14	0.53
produk akhir A	2.37	77.16	3.63	16.85
produk akhir B	1.76	70.60	1.69	25.95
group A	12.56	0.00	87.44	0.00
group B	10.43	0.00	89.57	0.00

VARIABLES

Variable Name	Total Changes	Average Seconds Per Change	Minimum Value	Maximum Value	Current Value	Average Value
ct1	4646	353.861840	0	1	0	0
ct2	8138	203.097829	0	1	0	0
cl1	2400	686.598325	0	30	13	16.4232
cl2	3921	426.011023	0	30	15	16.4919
hls1	4620	357.480554	0	3	0	0.302097
hls2	7546	221.360684	0	5	4	3.1902
pck1	72	22894.904722	0	72	72	38.5153
pck2	118	14144.280847	0	118	118	58.5683
ps1	11278	102.446757	0	10	4	7.0903
ps2	19824	62.457242	0	20	6	14.351
Var1	94	17488.505957	0	94	94	49.5775
Var2	151	10955.810331	0	151	151	74.2681
bf1	2387	691.831990	0	88	0	8.46633
bf2	3901	428.194750	0	252	5	42.8068

Lampiran G
Output Verifikasi.

00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 pasir enters gudang_pasir.
00:00:00.00 Select route from route block #1; output quantity is 1.
00:00:00.00 For pasir at gudang_pasir:
00:00:00.00 No location is available for routing.
00:00:00.00 pasir arrives at gudang_pasir.

54:29:01.82 For pasir at cetakan_A:
54:29:01.82 buffer_cetakan_A is selected for routing.
54:29:01.82 The main entity is routed out as pasir.
54:29:01.82 Output is named as pasir.
54:29:01.82 Wait for available Operator2.
54:29:01.82 For pasir at cetakan_A:
54:29:01.82 Process completed.
54:29:01.82 Wait for all its route entities to leave.
54:29:01.82 Operator2.1 starts work search.
54:29:01.82 Requested by pasir at gudang_pasir.
54:29:01.82 Operator2.1 starts moving to gudang_pasir.
54:29:04.17 Operator2.3 arrives at cetakan_B.
54:29:04.17 pasir is dropped off at cetakan_B by Operator2.3.
54:29:04.17 Operator2.3 is freed upon completion of delivery.
54:29:04.17 pasir arrives at cetakan_B.
54:29:04.17 cetakan_B.1 is selected.
54:29:04.17 Int: ps2 = 3 (old value = 2)
54:29:04.17 For pasir at cetakan_B.1:
54:29:04.17 pasir enters cetakan_B.1.
54:29:04.17 Group 3 of 5.
54:29:04.17 Operator2.3 starts work search.
54:29:04.17 Requested by pasir at gudang_pasir.
54:29:04.17 Operator2.3 starts moving to gudang_pasir.
54:29:04.17 Operator2.5 arrives at cetakan_B.
54:29:04.17 pasir is dropped off at cetakan_B by Operator2.5.
54:29:04.17 Operator2.5 is freed upon completion of delivery.
54:29:04.17 pasir arrives at cetakan_B.
54:29:04.17 cetakan_B.1 is selected.
54:29:04.17 Int: ps2 = 4 (old value = 3)
54:29:04.17 For pasir at cetakan_B.1:
54:29:04.17 pasir enters cetakan_B.1.
54:29:04.17 Group 4 of 5.
54:29:04.17 Operator2.5 starts work search.
54:29:04.17 Requested by pasir at gudang_pasir.
54:29:04.17 Operator2.5 starts moving to gudang_pasir.
54:29:10.84 Operator2.2 arrives at cetakan_B.
54:29:10.84 pasir is dropped off at cetakan_B by Operator2.2.
54:29:10.84 Operator2.2 is freed upon completion of delivery.
54:29:10.84 pasir arrives at cetakan_B.
54:29:10.84 cetakan_B.1 is selected.
54:29:10.84 Int: ps2 = 5 (old value = 4)
54:29:10.84 For pasir at cetakan_B.1:
54:29:10.84 pasir enters cetakan_B.1.

192:00:04.68 Select route from route block #1; output quantity is 1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 tanur is selected for routing.
192:00:04.68 The main entity is routed out as besi.
192:00:04.68 Output is named as besi.
192:00:04.68 Start move to tanur.
192:00:04.68 besi arrives at tanur.
192:00:04.68 For besi at tanur:
192:00:04.68 besi enters tanur.
192:00:04.68 Wait for available Operator1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Process completed.
192:00:04.68 Release the captured capacity.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Select route from route block #1; output quantity is 1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 tanur is selected for routing.
192:00:04.68 The main entity is routed out as besi.
192:00:04.68 Output is named as besi.
192:00:04.68 Start move to tanur.
192:00:04.68 besi arrives at tanur.
192:00:04.68 For besi at tanur:
192:00:04.68 besi enters tanur.
192:00:04.68 Wait for available Operator1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Process completed.
192:00:04.68 Release the captured capacity.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Select route from route block #1; output quantity is 1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 tanur is selected for routing.
192:00:04.68 The main entity is routed out as besi.
192:00:04.68 Output is named as besi.
192:00:04.68 Start move to tanur.
192:00:04.68 besi arrives at tanur.
192:00:04.68 For besi at tanur:
192:00:04.68 besi enters tanur.
192:00:04.68 Wait for available Operator1.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Process completed.
192:00:04.68 Release the captured capacity.
192:00:04.68 For besi at quene_tanur:
192:00:04.68 Select route from route block #1; output quantity is 1.

338:38:22.40 pasir enters cetakan_A.
338:38:22.40 Group 3 of 5.
338:38:22.40 Operator2.3 starts work search.
338:38:22.40 Requested by pasir at buffer_cetakan_A.
338:38:22.40 Operator2.3 starts moving to buffer_cetakan_A.
338:38:28.01 Operator2.2 arrives at gudang_pasir.
338:38:28.01 pasir at gudang_pasir picked up by Operator2.2.
338:38:28.01 Start move to cetakan_A.
338:38:28.01 For pasir at gudang_pasir:
338:38:28.01 Release the captured capacity.
338:38:29.42 Operator2.4 arrives at cetakan_A.
338:38:29.42 pasir is dropped off at cetakan_A by Operator2.4.
338:38:29.42 Operator2.4 is freed upon completion of delivery.
338:38:29.42 pasir arrives at cetakan_A.
338:38:29.42 Int: ps1 = 4 (old value = 3)
338:38:29.42 For pasir at cetakan_A:
338:38:29.42 pasir enters cetakan_A.
338:38:29.42 Group 4 of 5.
338:38:29.42 Operator2.4 starts work search.
338:38:29.42 Operator2.4 starts park search.
338:38:29.42 Needs to park at N4.
338:38:31.73 Operator2.3 arrives at buffer_cetakan_A.
338:38:31.73 pasir at buffer_cetakan_A picked up by Operator2.3.
338:38:31.73 Start move to pencetakan_A.
338:38:31.73 For pasir at buffer_cetakan_A:
338:38:31.73 Release the captured capacity.
338:38:34.59 Operator2.3 arrives at pencetakan_A.
338:38:34.59 pasir is dropped off at pencetakan_A by Operator2.3.
338:38:34.59 Operator2.3 is freed upon completion of delivery.
338:38:34.59 pasir arrives at pencetakan_A.
338:38:34.59 For pasir at pencetakan_A:
338:38:34.59 Loads 1 of 1 onto besi_tuang.
338:38:34.59 For besi_tuang at pencetakan_A:
338:38:34.59 Operator1.1 starts moving to pencetakan_A.
338:38:34.59 Operator2.3 starts work search.
338:38:34.59 Operator2.3 starts park search.
338:38:34.59 Needs to park at N4.
338:38:42.54 Operator2.2 arrives at cetakan_A.
338:38:42.54 pasir is dropped off at cetakan_A by Operator2.2.
338:38:42.54 Operator2.2 is freed upon completion of delivery.
338:38:42.54 pasir arrives at cetakan_A.
338:38:42.54 Int: ps1 = 5 (old value = 4)
338:38:42.54 For pasir at cetakan_A:
338:38:42.54 pasir enters cetakan_A.

456:19:44.67 For besi at tanur:
456:19:44.67 besi enters tanur.
456:19:44.67 Wait for available Operator1.
456:19:44.67 For besi at quene_tanur:
456:19:44.67 Process completed.
456:19:44.67 Release the captured capacity.
456:19:44.67 For besi at quene_tanur:
456:19:44.67 Select route from route block #1; output quantity is 1.
456:19:44.67 For besi at quene_tanur:
456:19:44.67 No location is available for routing.
456:19:44.67 Operator1.2 starts work search.
456:19:44.67 Requested by besi at tanur.
456:19:44.67 For besi at tanur:
456:19:44.67 Operator1.2 is already available at this location.
456:19:44.67 Use Operator1.2 for 1.24 Sec.
456:19:44.68 For besi at tanur:
456:19:44.68 Frees Operator1.1.
456:19:44.68 Select route from route block #1; output quantity is 1.
456:19:44.68 For besi at tanur:
456:19:44.68 queue_pencetakan_A is selected for routing.
456:19:44.68 The main entity is routed out as besi_tuang.
456:19:44.68 Output is named as besi_tuang.
456:19:44.68 Start move to queue_pencetakan_A.
456:19:44.68 besi_tuang arrives at queue_pencetakan_A.
456:19:44.68 For besi_tuang at queue_pencetakan_A:
456:19:44.68 besi_tuang enters queue_pencetakan_A.
456:19:44.68 Start moving for 10.40 Sec.
456:19:44.68 For besi at tanur:
456:19:44.68 Process completed.
456:19:44.68 Release the captured capacity.
456:19:44.68 For besi at quene_tanur:
456:19:44.68 The main entity is routed out as besi.
456:19:44.68 Output is named as besi.
456:19:44.68 Start move to tanur.
456:19:44.68 besi arrives at tanur.
456:19:44.68 For besi at tanur:
456:19:44.68 besi enters tanur.
456:19:44.68 Wait for available Operator1.
456:19:44.68 For besi at quene_tanur:
456:19:44.68 Process completed.
456:19:44.68 Release the captured capacity.
456:19:44.68 For besi at quene_tanur:
456:19:44.68 Select route from route block #1; output quantity is 1.
456:19:44.68 For besi at quene tanur: