LAMPIRAN

Lampiran 1. Peta Proses Operasi

Peta Proses Operasi

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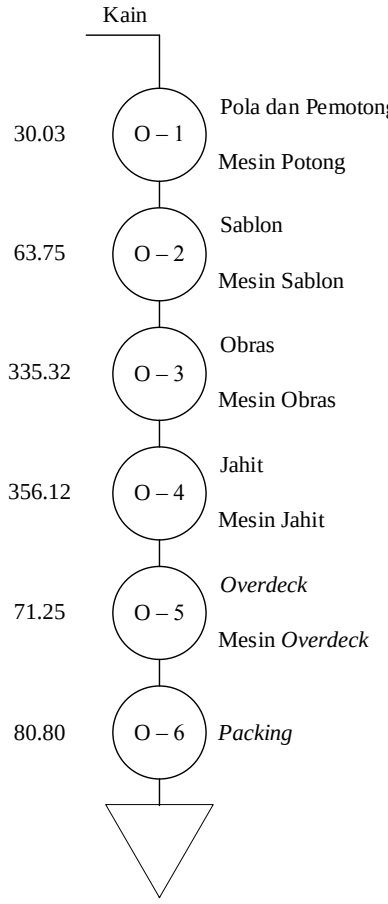
Nomor Peta : 1
Dipetakan Oleh : Mar'atus Sholikhah
Tanggal : 7 April 2022



RINGKASAN		
Kegiatan	Jumlah	Waktu
○ Operasi	6	937,27
Total	**6**	**937,27**

Lampiran 2. Perhitungan Uji Keseragaman Data

1) Sablon
   a) Pekerja ke 1
      a) $\sum xi = 820.03$
      b) $\bar{x} = \frac{\sum xi}{15} = \frac{820.03}{15} = 54.67$
      c) $\sum x^2 = 672449{,}20$
      d) $\sum xi^2 = 44877{,}33$
      e) $\sum (xi - \bar{x})^2 = 47{,}38$
      f) Jumlah pengamatan (N) = 15
      g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{47{,}38}{15 - 1}} = \sqrt{3{,}38} = 1{,}84$$

      h) Tingkat ketelitian (s)

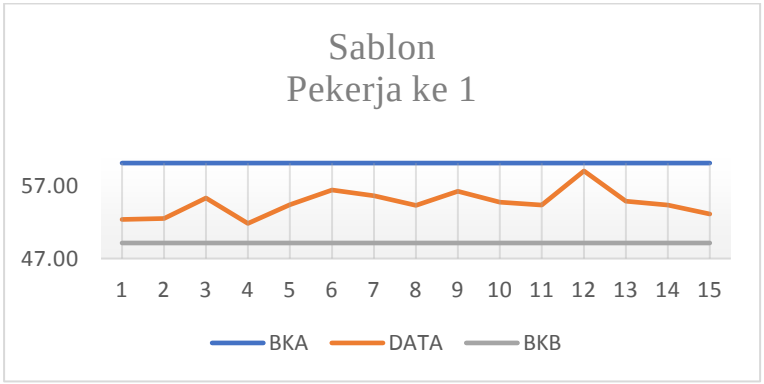
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{1{,}84}{54.67} \times 100\% = 0{,}034$$

      i) Tingkat kepercayaan (k)

$$CL = 100\% - s = 100\% - 0{,}034 = 96{,}60\% \approx 3$$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 54.67 + 3 \times 1{,}84 = 60{,}19$
- $BKB = \bar{x} - k \times \sigma = 54.67 - 3 \times 1{,}84 = 49{,}15$



Dapat dilihat bahwa semua data pengamatan pada sablon pekerja ke 1 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

2) Obras
   b) Pekerja ke 1
      a) $\sum xi = 4361{,}25$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{4361,25}{15} = 290,75$

c) $\sum x^2 = 19020501,56$

d) $\sum xi^2 = 1269490,32$

e) $\sum (xi - \bar{x})^2 = 1456,88$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{1456,88}{15 - 1}} = \sqrt{104,06} = 10,20$$

h) Tingkat ketelitian (s)

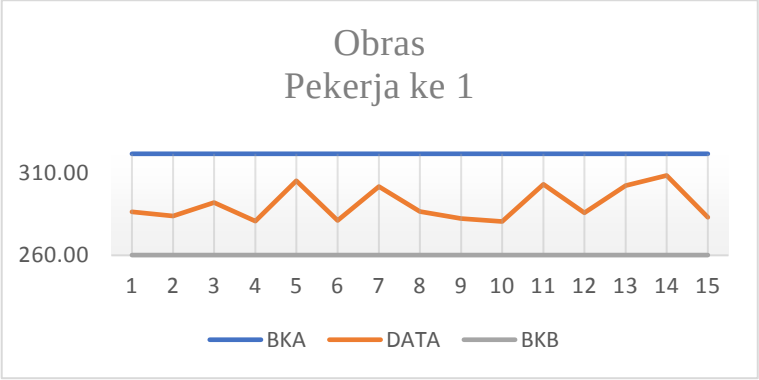
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{10,20}{290,75} \times 100\% = 0,035$$

i) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0,035 = 96,5\% \approx 3$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 290,75 + 3 \times 10,20 = 321,35$
- $BKB = \bar{x} - k \times \sigma = 290,75 - 3 \times 10,20 = 260,15$



Dapat dilihat bahwa semua data pengamatan pada obras pekerja ke 1 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

c) Pekerja ke 2

a) $\sum xi = 4444,77$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{4444,77}{15} = 296,32$

c) $\sum x^2 = 19755980,35$

d) $\sum xi^2 = 1318137,10$

e) $\sum (xi - \bar{x})^2 = 1071,75$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{1071{,}75}{15-1}} = \sqrt{76{,}55} = 8{,}75$$

h) Tingkat ketelitian (s)

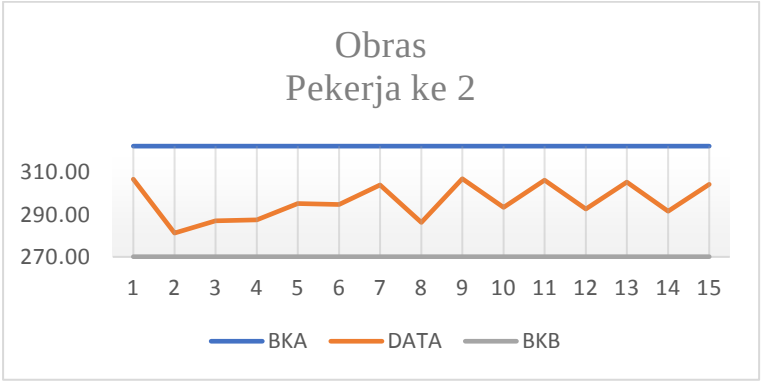
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{8{,}75}{296{,}32} \times 100\% = 0{,}035$$

i) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0{,}035 = 96{,}5\% \approx 3$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 296{,}32 + 3 \times 8{,}75 = 322{,}57$
- $BKB = \bar{x} - k \times \sigma = 296{,}32 - 3 \times 8{,}75 = 270{,}07$



Dapat dilihat bahwa semua data pengamatan pada obras pekerja ke 2 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

3) Jahit

➢ Pekerja ke 1

a) $\sum xi = 4395{,}88$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{4395{,}88}{15} = 293{,}06$

c) $\sum x^2 = 19323760{,}97$

d) $\sum xi^2 = 1289834{,}77$

e) $\sum(xi - \bar{x})^2 = 1584{,}04$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum(xi - \bar{x})^2}{N-1}} = \sqrt{\frac{1584{,}04}{15-1}} = \sqrt{113{,}15} = 10{,}64$$

h) Tingkat ketelitian (s)

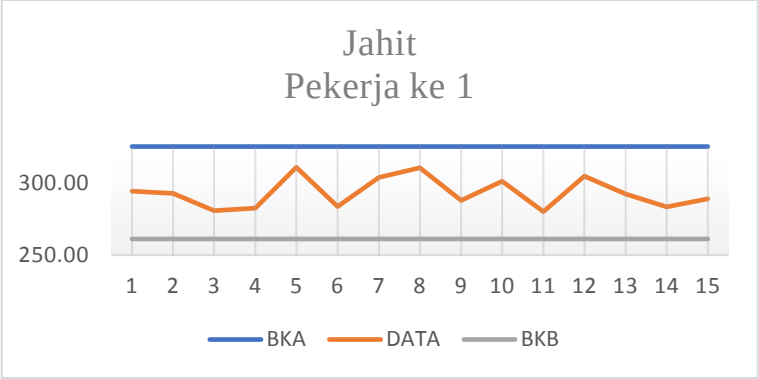
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{10{,}64}{293{,}06} \times 100\% = 0{,}036$$

i) Tingkat kepercayaan (k)

$$CL = 100\% - s = 100\% - 0{,}036 = 96{,}4\% \approx 3$$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 293{,}06 + 2 \times 10{,}64 = 324{,}97$
- $BKB = \bar{x} - k \times \sigma = 293{,}06 - 2 \times 10{,}64 = 261{,}15$



Dapat dilihat bahwa semua data pengamatan pada jahit pekerja ke 1 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

➢ Pekerja ke 2

a) $\sum xi = 4464{,}28$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{4464{,}28}{15} = 297{,}62$

c) $\sum x^2 = 19929795{,}92$

d) $\sum xi^2 = 1329987{,}18$

e) $\sum (xi - \bar{x})^2 = 1334{,}12$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{1334{,}12}{15 - 1}} = \sqrt{95{,}29} = 9{,}76$$

h) Tingkat ketelitian (s)

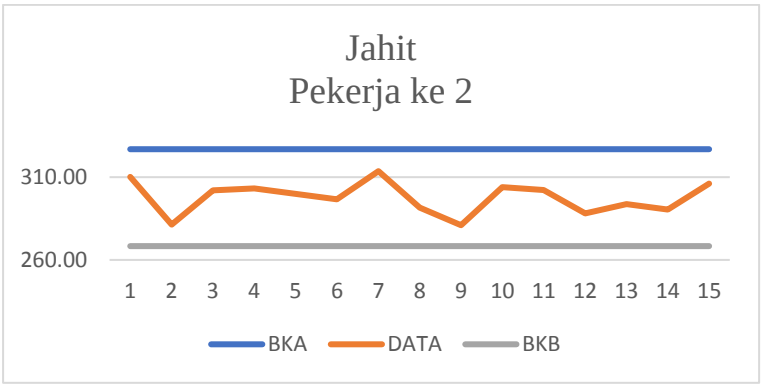
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{9{,}76}{297{,}62} \times 100\% = 0{,}033$$

i) Tingkat kepercayaan (k)

$$CL = 100\% - s = 100\% - 0{,}033 = 96{,}7\% \approx 3$$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 297{,}62 + 2 \times 9{,}76 = 326{,}90$
- $BKB = \bar{x} - k \times \sigma = 297{,}62 - 2 \times 9{,}76 = 268{,}33$



Dapat dilihat bahwa semua data pengamatan pada jahit pekerja ke 2 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

4) *Overdeck*

➢ Pekerja ke 1

a) $\sum xi = 877{,}73$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{877{,}73}{15} = 58{,}52$

c) $\sum x^2 = 770409{,}95$

d) $\sum xi^2 = 51657{,}42$

e) $\sum (xi - \bar{x})^2 = 296{,}76$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{296{,}76}{15 - 1}} = \sqrt{21{,}20} = 4{,}60$$

h) Tingkat ketelitian (s)

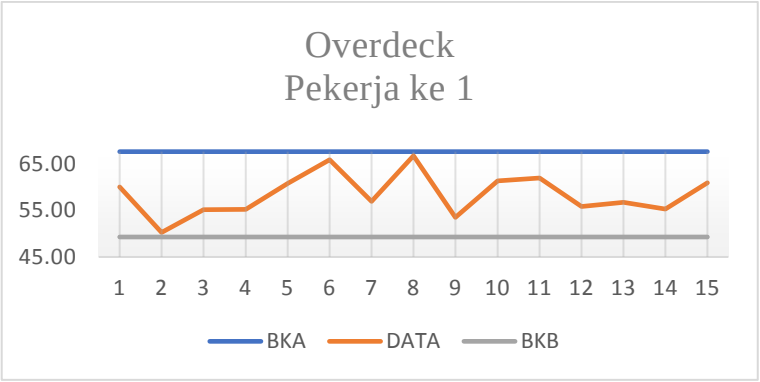
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{4{,}60}{58{,}52} \times 100\% = 0{,}079$$

i) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0{,}079 = 92{,}1\% \approx 2$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 58{,}52 + 2 \times 4{,}60 = 67{,}72$
- $BKB = \bar{x} - k \times \sigma = 58{,}52 - 2 \times 4{,}60 = 49{,}31$



Dapat dilihat bahwa semua data pengamatan pada *overdeck* pekerja ke 1 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

5) *Packing*

➢ Pekerja ke 1

a) $\sum xi = 1090{,}16$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{1090{,}16}{15} = 72{,}68$

c) $\sum x^2 = 1188448{,}83$

d) $\sum xi^2 = 80090{,}36$

e) $\sum (xi - \bar{x})^2 = 860{,}45$

f) Jumlah pengamatan (N) = 15

g) Standart deviasi

$$\sigma = \sqrt{\frac{\sum (xi - \bar{x})^2}{N - 1}} = \sqrt{\frac{860{,}45}{15 - 1}} = \sqrt{61{,}46} = 7{,}84$$

h) Tingkat ketelitian (s)

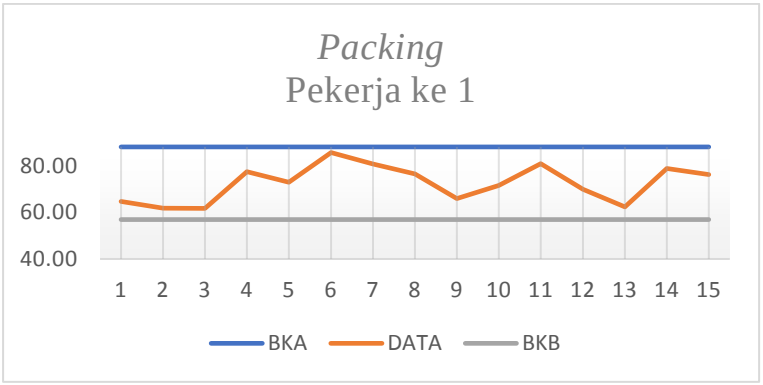
$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{7{,}84}{72{,}68} \times 100\% = 0{,}108$$

i) Tingkat kepercayaan (k)

$$CL = 100\% - s = 100\% - 0{,}108 = 89{,}2\% \approx 2$$

Uji Keseragaman Data

- $BKA = \bar{x} + k \times \sigma = 72{,}68 + 2 \times 7{,}84 = 88{,}36$
- $BKB = \bar{x} - k \times \sigma = 72{,}68 - 2 \times 7{,}84 = 57{,}00$



Dapat dilihat bahwa semua data pengamatan pada *packing* pekerja ke 1 masuk dalam BKA dan BKB, maka data pengamatan tersebut sudah seragam.

Lampiran 3. Perhitungan Uji Kecukupan Data

1) Sablon
   - Pekerja ke 1
     a) $\sum xi = 820{,}03$
     b) $\bar{x} = \frac{\sum xi}{15} = \frac{820{,}03}{15} = 54{,}67$
     c) $\sum x^2 = 672449{,}20$
     d) $\sum xi^2 = 44877{,}33$
     e) Jumlah pengamatan (N) = 15
     f) Tingkat ketelitian (s)
     $$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{1{,}84}{54{,}67} \times 100\% = 0{,}034$$
     g) Tingkat kepercayaan (k)
     $CL = 100\% - s = 100\% - 0{,}034 = 96{,}60\% \approx 3$
     Uji Kecukupan Data
     - $N' = \left(\frac{\frac{k}{s}\sqrt{N \times \sum xi^2 - \sum x^2}}{\sum xi}\right)^2$

     $$N' = \left(\frac{\frac{3}{0{,}034}\sqrt{15 \times 44877{,}33 - 672449{,}20}}{820{,}03}\right)^2$$

     $N' = 8{,}2 \approx 8$

     Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 8). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.
2) Obras
   - Pekerja ke 1
     a) $\sum xi = 4361{,}25$
     b) $\bar{x} = \frac{\sum xi}{15} = \frac{4361{,}25}{15} = 290{,}75$
     c) $\sum x^2 = 19020501{,}56$
     d) $\sum xi^2 = 1269490{,}32$
     e) Jumlah pengamatan (N) = 15
     f) Tingkat ketelitian (s)
     $$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{10{,}20}{290{,}75} \times 100\% = 0{,}035$$

g) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0{,}035 = 96{,}5\% \approx 3$

Uji Kecukupan Data

- $N' = \left(\frac{\frac{k}{s}\sqrt{N \times \sum xi^2 - \sum x^2}}{\sum xi}\right)^2$

$$N' = \left(\frac{\frac{3}{0{,}035}\sqrt{15 \times 1269490{,}32 - 19020501{,}56}}{4361{,}25}\right)^2$$

$N' = 8{,}4 \approx 8$

Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 8). Maka, jumlah data yang diambil sudah mencukupi.

➢ Pekerja ke 2

a) $\sum xi = 4444{,}77$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{44444{,}77}{15} = 296{,}32$

c) $\sum x^2 = 19755980{,}35$

d) $\sum xi^2 = 1318137{,}10$

e) Jumlah pengamatan (N) = 15

f) Tingkat ketelitian (s)

$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{8{,}75}{296{,}32} \times 100\% = 0{,}030$$

g) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0{,}030 = 97{,}0\% \approx 3$

Uji Kecukupan Data

- $N' = \left(\frac{\frac{k}{s}\sqrt{N \times \sum xi^2 - \sum x^2}}{\sum xi}\right)^2$

$$N' = \left(\frac{\frac{3}{0{,}030}\sqrt{15 \times 1318137{,}10 - 19755980{,}35}}{4444{,}77}\right)^2$$

$N' = 8{,}1 \approx 8$

Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 8). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.

3) Jahit

- Pekerja ke 1
  a) $\sum xi = 4395{,}88$
  b) $\bar{x} = \frac{\sum xi}{15} = \frac{4395{,}88}{15} = 293{,}06$
  c) $\sum x^2 = 19323760{,}97$
  d) $\sum xi^2 = 1289834{,}77$
  e) Jumlah pengamatan (N) = 15
  f) Tingkat ketelitian (s)
  $s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{10{,}64}{293{,}06} \times 100\% = 0{,}036$
  g) Tingkat kepercayaan (k)
  $CL = 100\% - s = 100\% - 0{,}036 = 96{,}4\% \approx 3$

  Uji Kecukupan Data

  - $N' = \left(\frac{\frac{k}{s}\sqrt{N \times \sum xi^2 - \sum x^2}}{\sum xi}\right)^2$

    $N' = \left(\frac{\frac{3}{0{,}036}\sqrt{15 \times 1289834{,}77 - 19323760{,}97}}{4395{,}88}\right)^2$

    $N' = 8{,}5 \approx 8$

    Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 8). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.

- Pekerja ke 2
  a) $\sum xi = 4464{,}28$
  b) $\bar{x} = \frac{\sum xi}{15} = \frac{4464{,}28}{15} = 297{,}62$
  c) $\sum x^2 = 19929795{,}92$
  d) $\sum xi^2 = 1329987{,}18$
  e) Jumlah pengamatan (N) = 15
  f) Tingkat ketelitian (s)
  $s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{9{,}76}{297{,}62} \times 100\% = 0{,}033$
  g) Tingkat kepercayaan (k)
  $CL = 100\% - s = 100\% - 0{,}033 = 96{,}7\% \approx 3$

Uji Kecukupan Data

- $N' = \left(\frac{\frac{k}{s}\sqrt{N\times\sum xi^2-\sum x^2}}{\sum xi}\right)^2$

$N' = \left(\frac{\frac{3}{0{,}033}\sqrt{15\times1329987{,}18-19929795{,}92}}{4464{,}28}\right)^2$

$N' = 8{,}3 \approx 8$

Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 8). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.

4) *Overdeck*

➢ Pekerja ke 1

a) $\sum xi = 877{,}73$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{877{,}73}{15} = 58{,}52$

c) $\sum x^2 = 770409{,}95$

d) $\sum xi^2 = 51657{,}42$

e) Jumlah pengamatan (N) = 15

f) Tingkat ketelitian (s)

$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{4{,}60}{58{,}52} \times 100\% = 0{,}079$

g) Tingkat kepercayaan (k)

$CL = 100\% - s = 100\% - 0{,}079 = 92{,}1\% \approx 2$

Uji Kecukupan Data

- $N' = \left(\frac{\frac{k}{s}\sqrt{N\times\sum xi^2-\sum x^2}}{\sum xi}\right)^2$

$N' = \left(\frac{\frac{2}{0{,}079}\sqrt{15\times51657{,}42-770409{,}95}}{877{,}73}\right)^2$

$N' = 3{,}7 \approx 4$

Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 4). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.

5) *Packing*

➢ Pekerja ke 1

a) $\sum xi = 1090{,}16$

b) $\bar{x} = \frac{\sum xi}{15} = \frac{1090,16}{15} = 72,68$

c) $\sum x^2 = 1188448,83$

d) $\sum xi^2 = 80090,36$

e) Jumlah pengamatan (N) = 15

f) Tingkat ketelitian (s)

$$s = \frac{\sigma}{\bar{x}} \times 100\% = \frac{7,84}{72,68} \times 100\% = 0,108$$

g) Tingkat kepercayaan (k)

$$CL = 100\% - s = 100\% - 0,108 = 89,2\% \approx 2$$

Uji Kecukupan Data

- $$N' = \left(\frac{\frac{k}{s}\sqrt{N \times \sum xi^2 - \sum x^2}}{\sum xi} \right)^2$$

$$N' = \left(\frac{\frac{2}{0,108}\sqrt{15 \times 80090,36 - 1188448,83}}{1090,16} \right)^2$$

$$N' = 3,7 \approx 4$$

Dapat dilihat dari hasil perhitungan diatas, diperoleh jumlah data yang telah diambil (N = 15) lebih besar daripada jumlah data yang harus diambil (N' = 4). Maka, jumlah data yang diambil saat pengamatan sudah mencukupi.

Lampiran 4. Perhitungan Waktu Normal

1) Sablon
   - Pekerja ke 1

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 54{,}67 \times 1{,}13 = 61{,}78$
2) Obras
   - Pekerja ke 1

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 290{,}75 \times 1{,}14 = 331{,}46$
   - Pekerja ke 2

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 296{,}32 \times 1{,}08 = 320{,}02$
3) Jahit
   - Pekerja ke 1

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 293{,}06 \times 1{,}18 = 345{,}81$
   - Pekerja ke 2

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 297{,}62 \times 1{,}16 = 345{,}24$
4) *Overdeck*
   - Pekerja ke 1

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 58{,}52 \times 1{,}18 = 69{,}05$
5) *Packing*
   - Pekerja ke 1

     $Wn = \bar{x} \times Performance\ rating(\%)$

     $Wn = 72{,}68 \times 1{,}08 = 78{,}49$

Lampiran 5. Perhitungan Waktu Standart

1) Sablon
   - Pekerja ke 1

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 61{,}78 \times \frac{100\%}{100\% - 3{,}10\%}$$
$$Ws = 63{,}75$$

2) Obras
   - Pekerja ke 1

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 331{,}46 \times \frac{100\%}{100\% - 2{,}86\%}$$
$$Ws = 341{,}20$$

   - Pekerja ke 2

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 320{,}02 \times \frac{100\%}{100\% - 2{,}86\%}$$
$$Ws = 329{,}44$$

3) Jahit
   - Pekerja ke 1

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 345{,}81 \times \frac{100\%}{100\% - 2{,}86\%}$$
$$Ws = 355{,}98$$

   - Pekerja ke 2

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 345{,}24 \times \frac{100\%}{100\% - 3{,}10\%}$$
$$Ws = 356{,}26$$

4) *Overdeck*
   - Pekerja ke 1

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 69{,}05 \times \frac{100\%}{100\% - 3{,}10\%}$$
$$Ws = 71{,}25$$

5) *Packing*
   - Pekerja ke 1

$$Ws = Wn \times \frac{100\%}{100\% - \%allowance}$$
$$Ws = 78{,}49 \times \frac{100\%}{100\% - 2{,}86\%}$$
$$Ws = 80{,}80$$

Lampiran 6. Perhitungan Output Standart

1) Sablon
   - Pekerja ke 1
     a) OS per Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{63{,}75} \times 25200 = 396$$

     b) OS per 14 Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{63{,}75} \times 352800 = 5535$$

2) Obras
   - Pekerja ke 1
     a) OS per Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{341{,}20} \times 25200 = 74$$

     b) OS per 14 Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{341{,}20} \times 352800 = 1034$$

   - Pekerja ke 2
     a) OS per Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{329{,}44} \times 25200 = 77$$

     b) OS per 14 Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{329{,}44} \times 352800 = 1071$$

3) Jahit
   - Pekerja ke 1
     a) OS per Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{355{,}98} \times 25200 = 71$$
     b) OS per 14 Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{355{,}98} \times 352800 = 992$$
   - Pekerja ke 2
     a) OS per Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{356{,}26} \times 25200 = 71$$
     b) OS per 14 Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{356{,}26} \times 352800 = 991$$

4) *Overdeck*
   - Pekerja ke 1
     a) OS per Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{71{,}25} \times 25200 = 354$$
     b) OS per 14 Hari
        $$OS = \frac{1}{Ws} \times jam\ kerja$$
        $$OS = \frac{1}{71{,}25} \times 352800 = 4952$$

5) *Packing*

- Pekerja ke 1

a) OS per Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{80{,}80} \times 25200 = 312$$

b) OS per 14 Hari

$$OS = \frac{1}{Ws} \times jam\ kerja$$

$$OS = \frac{1}{80{,}80} \times 352800 = 4367$$

Lampiran 7. Perbandingan Line Balancing

A. Waktu Sekunder

1. Stasiun Kerja II
   a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{67{,}20}{252{,}00} \times 100\%$$

$$LE = 26{,}67\%$$

   b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{252{,}00 - 67{,}20}{252{,}00} \times 100\%$$

$$BD = 73{,}33\%$$

2. Stasiun Kerja III
   a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{180{,}00}{252{,}00} \times 100\%$$

$$LE = 71{,}43\%$$

   b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{252{,}00 - 180{,}00}{252{,}00} \times 100\%$$

$$BD = 28{,}57\%$$

3. Stasiun Kerja IV
   a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{252{,}00}{252{,}00} \times 100\%$$

$$LE = 100{,}00\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{252{,}00 - 252{,}00}{252{,}00} \times 100\%$$

$$BD = 0{,}00\%$$

4. Stasiun Kerja V

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{252{,}00}{252{,}00} \times 100\%$$

$$LE = 100{,}00\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{252{,}00 - 252{,}00}{252{,}00} \times 100\%$$

$$BD = 0{,}00\%$$

5. Stasiun Kerja VI

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{252{,}00}{252{,}00} \times 100\%$$

$$LE = 100{,}00\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{252{,}00 - 252{,}00}{252{,}00} \times 100\%$$

$$BD = 0{,}00\%$$

B. Waktu Primer

1. Stasiun Kerja I

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{25{,}70}{147{,}37} \times 100\%$$

$$LE = 17{,}44\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 25{,}70}{147{,}37} \times 100\%$$

$$BD = 82{,}56\%$$

2. Stasiun Kerja II

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{54{,}67}{147{,}37} \times 100\%$$

$$LE = 37{,}10\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 54{,}67}{147{,}37} \times 100\%$$

$$BD = 62{,}90\%$$

3. Stasiun Kerja III

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{293{,}53}{147{,}37} \times 100\%$$

$$LE = 199{,}18\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 293{,}53}{147{,}37} \times 100\%$$

$$BD = -99{,}18\%$$

4. Stasiun Kerja IV

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{295{,}34}{147{,}37} \times 100\%$$

$$LE = 200{,}41\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 295{,}34}{147{,}37} \times 100\%$$

$$BD = -100{,}41\%$$

5. Stasiun Kerja V

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{58{,}52}{147{,}37} \times 100\%$$

$$LE = 39{,}71\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 58{,}52}{147{,}37} \times 100\%$$

$$BD = 60{,}29\%$$

6. Stasiun Kerja VI

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{72{,}68}{147{,}37} \times 100\%$$

$$LE = 49{,}32\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{147{,}37 - 72{,}68}{147{,}37} \times 100\%$$

$$BD = 50{,}68\%$$

C. Waktu Standart

1. Stasiun Kerja I

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{30{,}03}{177{,}46} \times 100\%$$

$$LE = 16{,}92\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 30{,}03}{177{,}46} \times 100\%$$

$$BD = 83{,}08\%$$

2. Stasiun Kerja II

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{63{,}75}{177{,}46} \times 100\%$$

$$LE = 35{,}92\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 63{,}75}{177{,}46} \times 100\%$$

$$BD = 64{,}08\%$$

3. Stasiun Kerja III

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{335{,}32}{177{,}46} \times 100\%$$

$$LE = 188{,}95\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 335{,}32}{177{,}46} \times 100\%$$

$$BD = -88{,}95\%$$

4. Stasiun Kerja IV

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{356{,}12}{177{,}46} \times 100\%$$

$$LE = 200{,}67\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 356{,}12}{177{,}46} \times 100\%$$

$$BD = -100{,}67\%$$

5. Stasiun Kerja V

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{71{,}25}{177{,}46} \times 100\%$$

$$LE = 40{,}15\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 71{,}25}{177{,}46} \times 100\%$$

$$BD = 59{,}85\%$$

6. Stasiun Kerja V

a. *Line Efisiensi*

$$LE = \frac{waktu\ operasi}{cycle\ time} \times 100\%$$

$$LE = \frac{80{,}80}{177{,}46} \times 100\%$$

$$LE = 45{,}53\%$$

b. *Balance Delay*

$$BD = \frac{cycle\ time - waktu\ operasi}{cycle\ time} \times 100\%$$

$$BD = \frac{177{,}46 - 80{,}80}{177{,}46} \times 100\%$$

$$BD = 54{,}47\%$$