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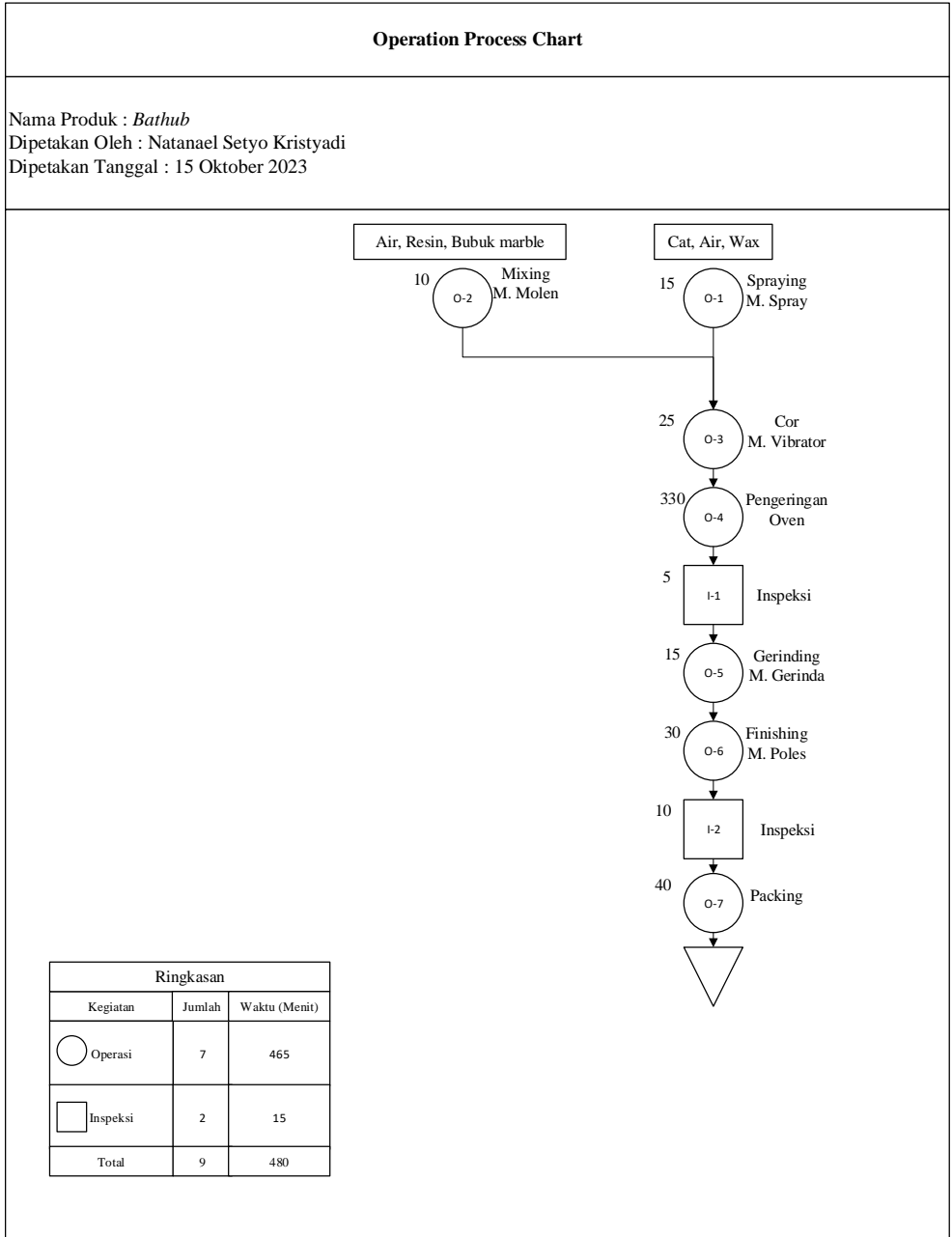
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LAMPIRAN

Operation Process Chart



Uji Keseragaman Data

1) Operator 1

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{148}{10} = 14,8$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,48$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 9,97$$

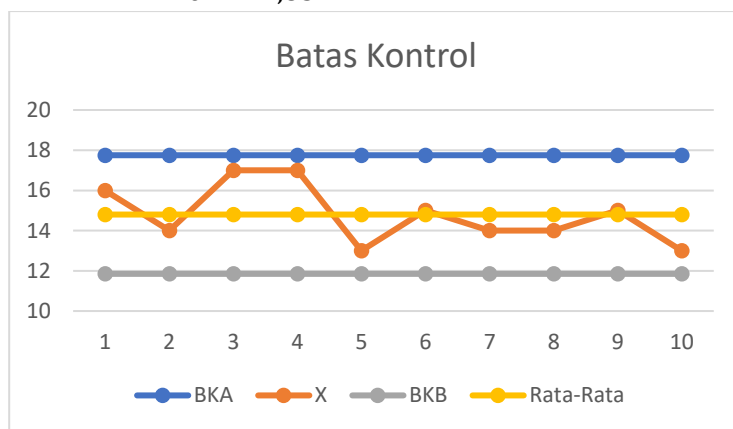
d) Tingkat Kepercayaan

$$CL = 100\% - S = 90,03\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 17,75$$

$$BKB = \bar{X} - K\sigma = 11,85$$



2) Operator 2

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{107}{10} = 10,7$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 0,82$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 7,69$$

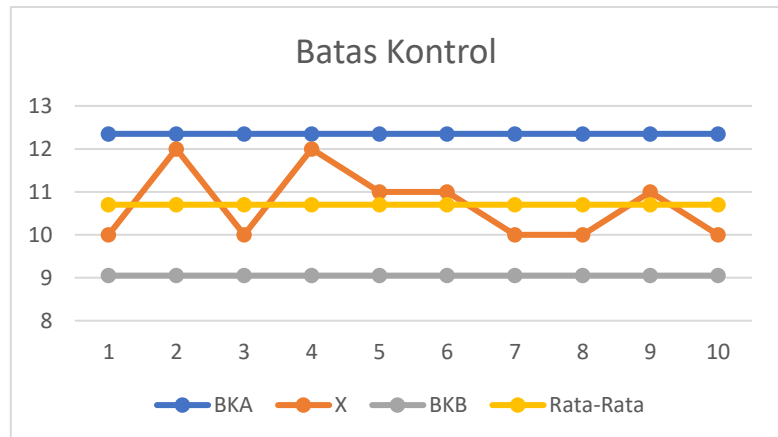
d) Tingkat Kepercayaan

$$CL = 100\% - S = 92,31\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 12,35$$

$$BKB = \bar{X} - K\sigma = 9,05$$



3) Operator 3

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{108}{10} = 10.8$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 0.92$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 8,51$$

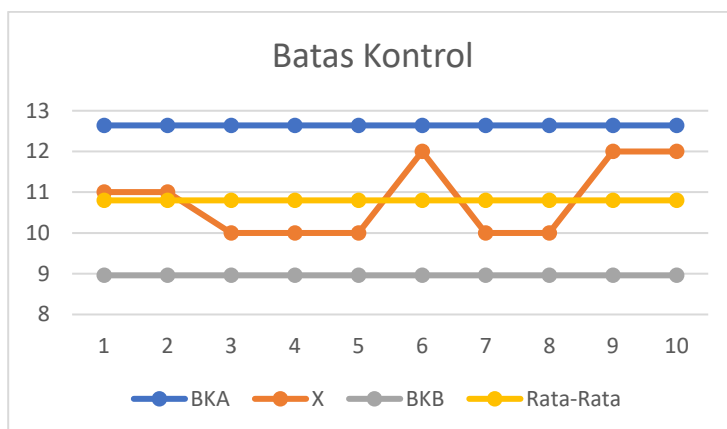
d) Tingkat Kepercayaan

$$CL = 100\% - S = 91.49\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 12.64$$

$$BKB = \bar{X} - K\sigma = 8,96$$



4) Operator 4

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{254}{10} = 25.4$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.26$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4.98$$

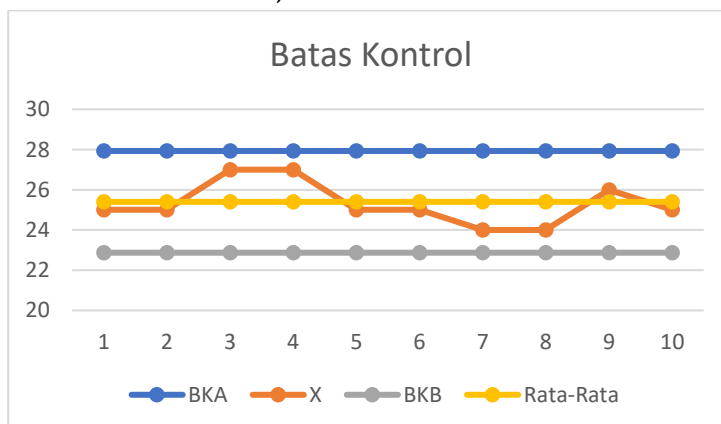
d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,02\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 27,93$$

$$BKB = \bar{X} - K\sigma = 22,87$$



5) Operator 5

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{254}{10} = 25.4$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.26$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4.98$$

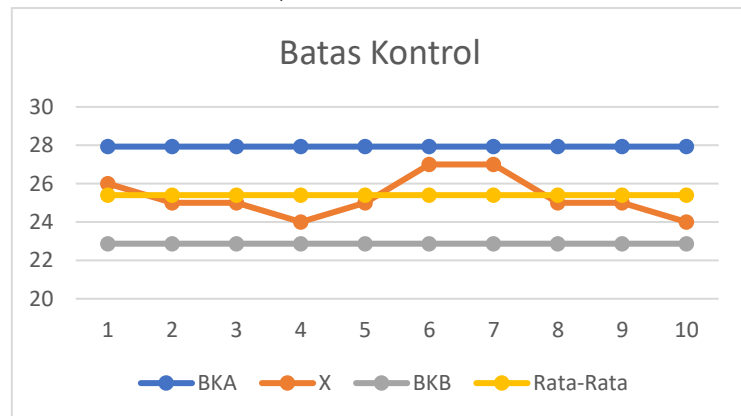
d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,02\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 27.93$$

$$BKB = \bar{X} - K\sigma = 22,87$$



6) Operator 6

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{257}{10} = 25.7$$

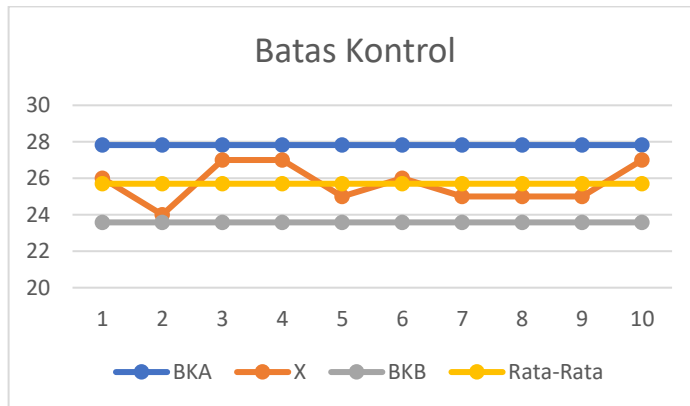
b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.06$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4.12$$

- d) Tingkat Kepercayaan
 $CL = 100\% - S = 95.88\% \approx 2$
- e) Batas Kontrol
 $BKA = \bar{X} + K\sigma = 27.82$
 $BKB = \bar{X} - K\sigma = 23.58$

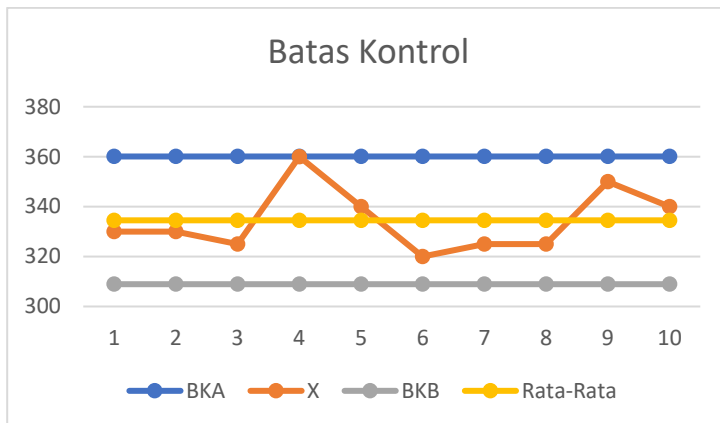


- 7) Operator 7
- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{3345}{10} = 334.5$$
- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 12.79$$
- c) Tingkat Ketelitian
 $S = \frac{\sigma}{\bar{X}} \times 100\% = 3.82$
- d) Tingkat Kepercayaan
 $CL = 100\% - S = 96.18\% \approx 2$
- e) Batas Kontrol
 $BKA = \bar{X} + K\sigma = 360.08$
 $BKB = \bar{X} - K\sigma = 308.92$



8) Operator 8

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{159}{10} = 15.9$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.37$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 8,62$$

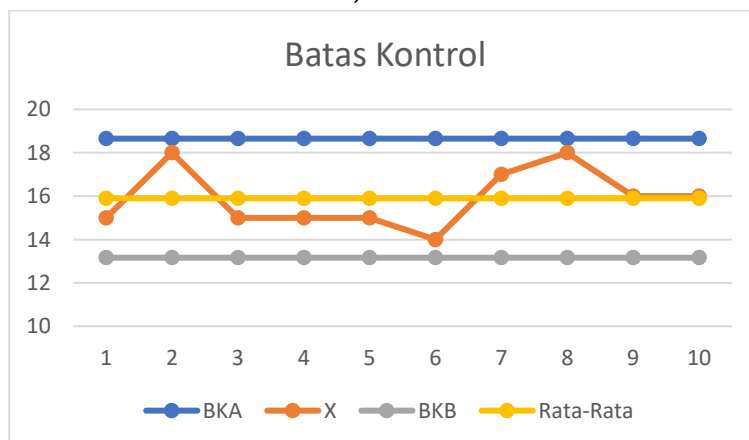
d) Tingkat Kepercayaan

$$CL = 100\% - S = 91,38\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 18,64$$

$$BKB = \bar{X} - K\sigma = 13,16$$



9) Operator 9

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{164}{10} = 16.4$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.65$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 10.04$$

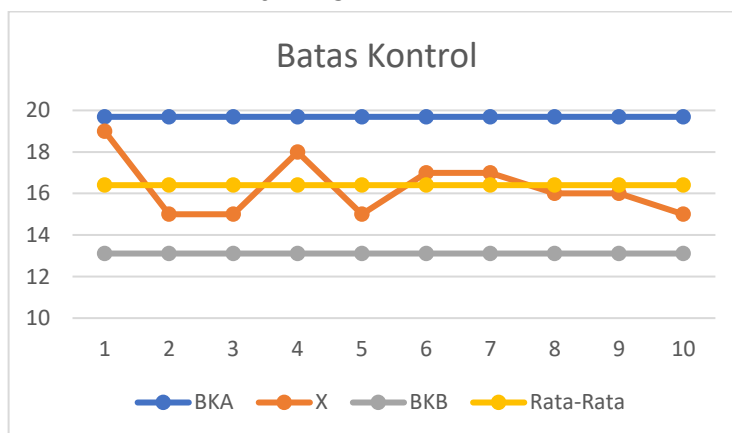
d) Tingkat Kepercayaan

$$CL = 100\% - S = 89.96\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 19.69$$

$$BKB = \bar{X} - K\sigma = 13.11$$



10) Operator 10

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{348}{10} = 34.8$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2.78$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 7.99$$

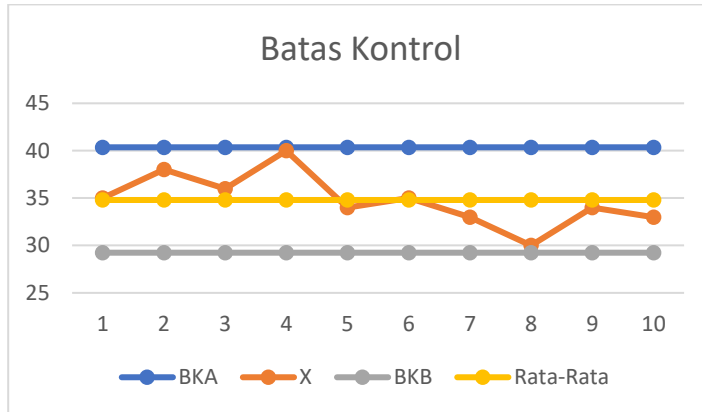
d) Tingkat Kepercayaan

$$CL = 100\% - S = 92,01\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 40,36$$

$$BKB = \bar{X} - K\sigma = 29,24$$



11) Operator 11

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{337}{10} = 33,7$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,11$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 6,26$$

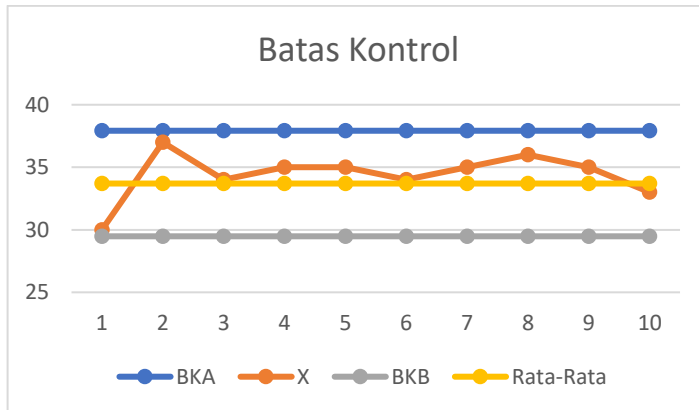
d) Tingkat Kepercayaan

$$CL = 100\% - S = 93,74\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37,92$$

$$BKB = \bar{X} - K\sigma = 29,48$$



12) Operator 12

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{347}{10} = 34.7$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.34$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 3,85$$

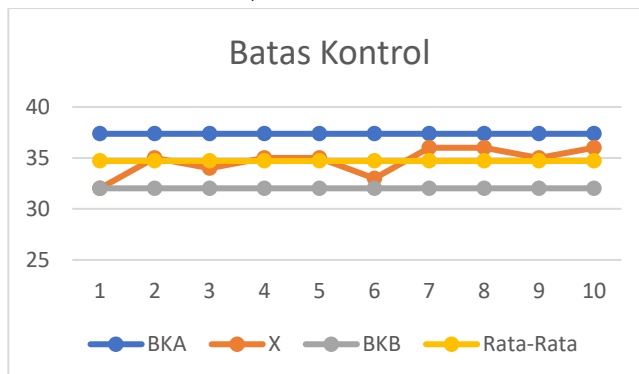
d) Tingkat Kepercayaan

$$CL = 100\% - S = 96,15\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37,37$$

$$BKB = \bar{X} - K\sigma = 32,03$$



13) Operator 13

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{346}{10} = 34,6$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,51$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4,35$$

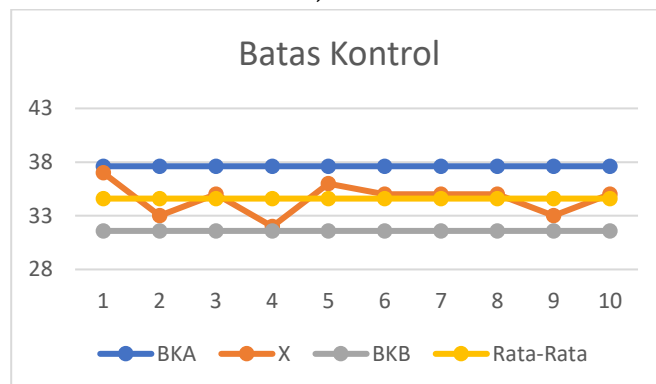
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,65\% \approx 2$$

- e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37,61$$

$$BKB = \bar{X} - K\sigma = 31,59$$



14) Operator 14

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{352}{10} = 35,2$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2.15$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 6,11$$

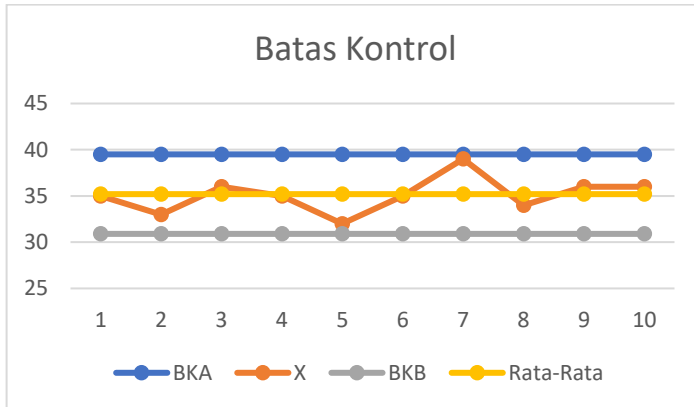
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 93,89\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 39,50$$

$$BKB = \bar{X} - K\sigma = 30,90$$



15) Operator 15

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{347}{10} = 34.7$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.25$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 3,61$$

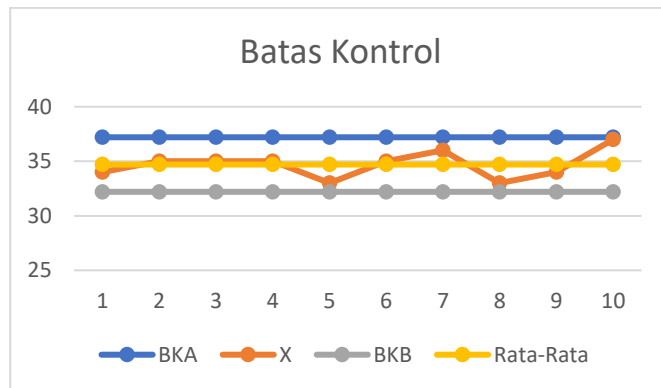
d) Tingkat Kepercayaan

$$CL = 100\% - S = 96,39\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37,20$$

$$BKB = \bar{X} - K\sigma = 32,20$$



16) Operator 16

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{353}{10} = 35,3$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,06$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 5,83$$

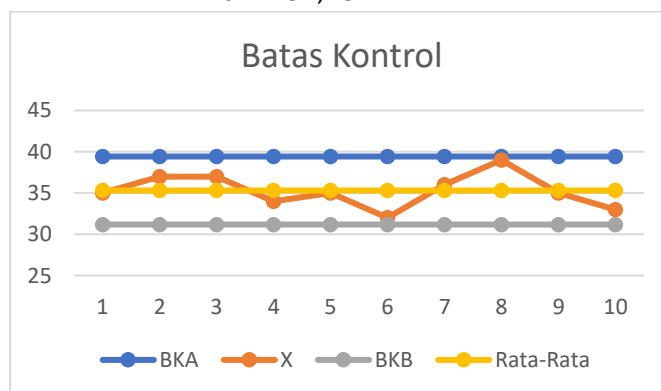
d) Tingkat Kepercayaan

$$CL = 100\% - S = 91,17\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 39,42$$

$$BKB = \bar{X} - K\sigma = 31,18$$



17) Operator 17

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{351}{10} = 35,1$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,66$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4,74$$

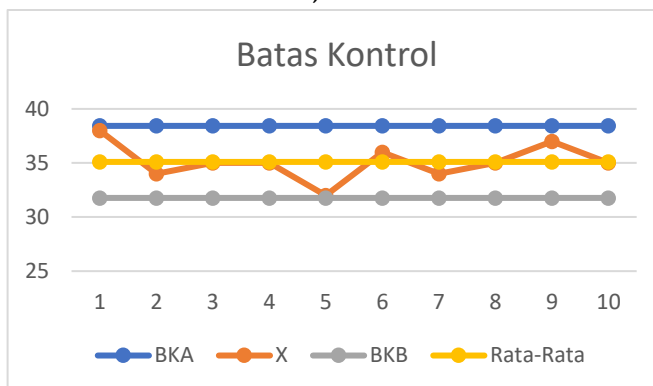
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,26\% \approx 2$$

- e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 38,43$$

$$BKB = \bar{X} - K\sigma = 31,77$$



18) Operator 18

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{331}{10} = 33,1$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,23$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 6,75$$

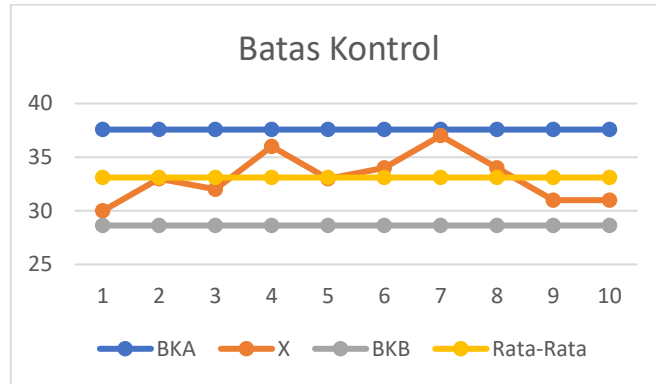
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 93,25\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37.57$$

$$BKB = \bar{X} - K\sigma = 28.63$$



19) Operator 19

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{339}{10} = 33,9$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,18$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 6,44$$

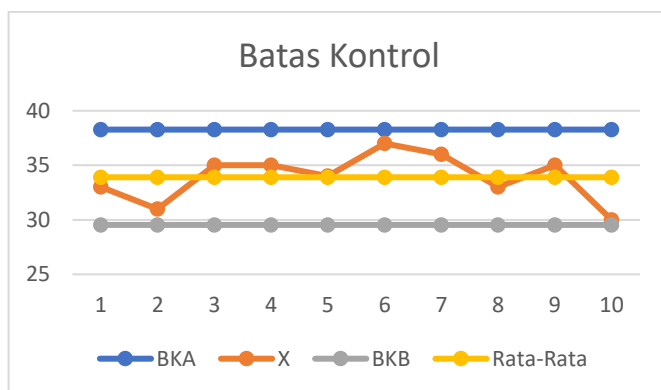
d) Tingkat Kepercayaan

$$CL = 100\% - S = 93,56\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 38.27$$

$$BKB = \bar{X} - K\sigma = 29,53$$



20) Operator 20

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{338}{10} = 33,8$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,40$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4,14$$

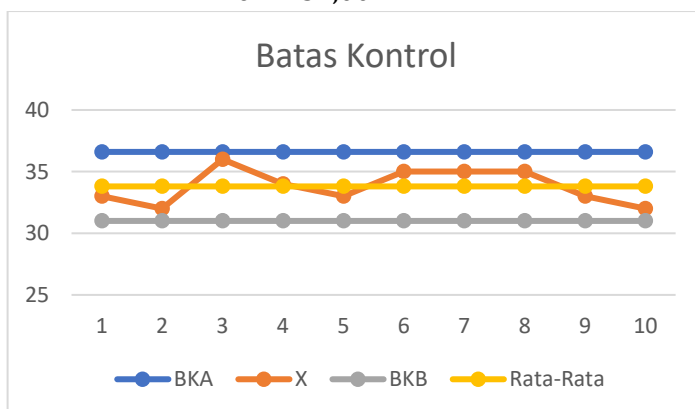
d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,86\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 36,60$$

$$BKB = \bar{X} - K\sigma = 31,00$$



21) Operator 21

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{335}{10} = 33,5$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1.84$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 5.50$$

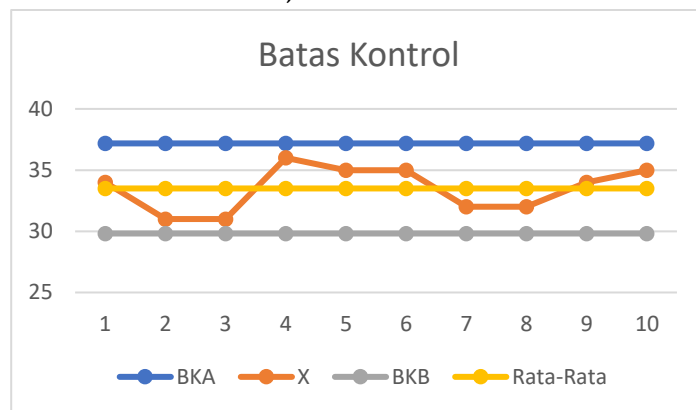
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 94,50\% \approx 2$$

- e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 37,18$$

$$BKB = \bar{X} - K\sigma = 29,82$$



22) Operator 22

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{364}{10} = 36,4$$

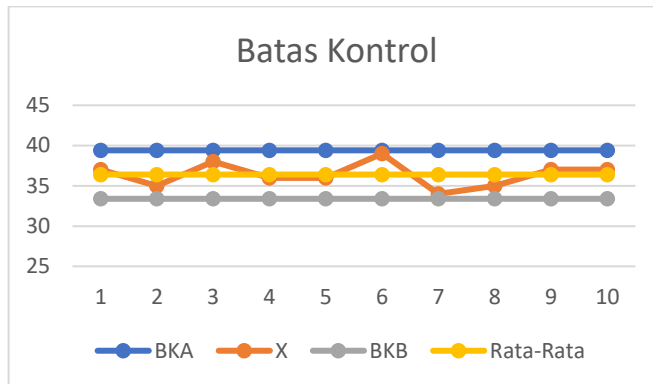
- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,51$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4,14$$

- d) Tingkat Kepercayaan
 $CL = 100\% - S = 95,86\% \approx 2$
- e) Batas Kontrol
 $BKA = \bar{X} + K\sigma = 39,41$
 $BKB = \bar{X} - K\sigma = 33,39$



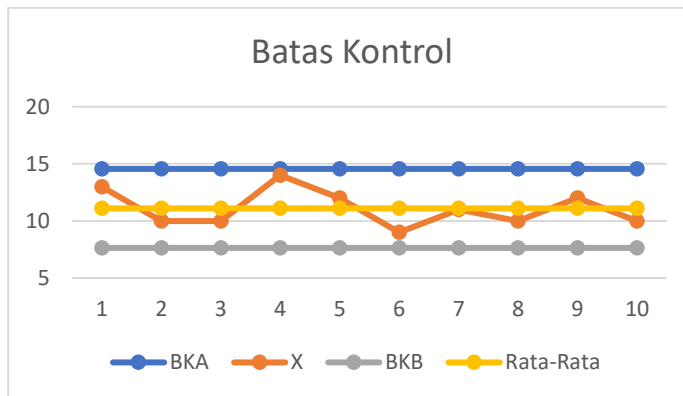
23) Operator 23

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{111}{10} = 11.1$$
- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,73$$
- c) Tingkat Ketelitian
 $S = \frac{\sigma}{\bar{X}} \times 100\% = 15,58$
- d) Tingkat Kepercayaan
 $CL = 100\% - S = 84,42\% \approx 2$
- e) Batas Kontrol
 $BKA = \bar{X} + K\sigma = 14,56$
 $BKB = \bar{X} - K\sigma = 7,64$



24) Operator 24

a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{424}{10} = 42,4$$

b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,80$$

c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 6,60$$

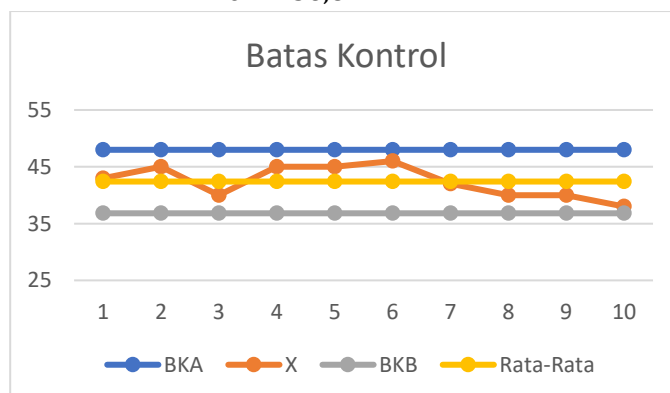
d) Tingkat Kepercayaan

$$CL = 100\% - S = 93,40\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 47,99$$

$$BKB = \bar{X} - K\sigma = 36,81$$



25) Operator 25

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{438}{10} = 43,8$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 2,25$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 5,14$$

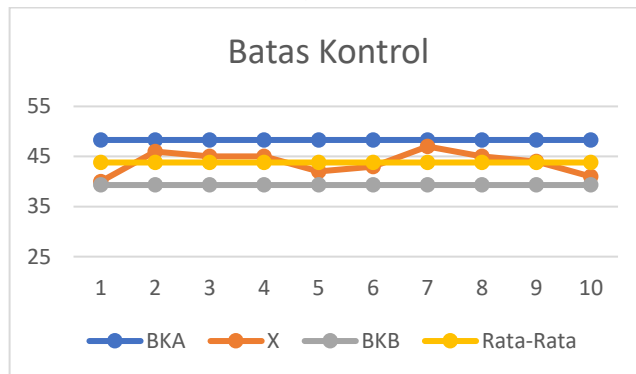
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 94,86\% \approx 2$$

- e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 48,30$$

$$BKB = \bar{X} - K\sigma = 39,30$$



26) Operator 26

- a) Nilai rata-rata

$$\bar{X} = \frac{\sum x_i}{N}$$

$$\bar{X} = \frac{443}{10} = 44,3$$

- b) Standar deviasi

$$s = \sqrt{\frac{\sum (x_i - \bar{X})^2}{N-1}} = 1,83$$

- c) Tingkat Ketelitian

$$S = \frac{\sigma}{\bar{X}} \times 100\% = 4,13$$

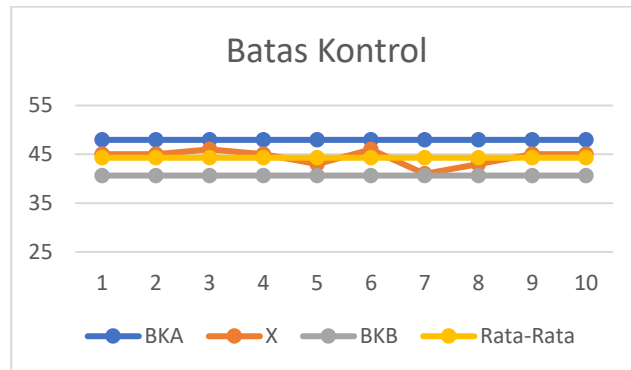
- d) Tingkat Kepercayaan

$$CL = 100\% - S = 95,87\% \approx 2$$

e) Batas Kontrol

$$BKA = \bar{X} + K\sigma = 47,96$$

$$BKB = \bar{X} - K\sigma = 40,64$$



Uji Kecukupan Data

➤ Operator 1

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 2

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 3

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 4

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 5

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 6

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 7

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 8

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 9

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 10

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 11

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 12

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 13

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 14

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 15

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 16

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 17

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 18

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 19

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 20

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 21

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 22

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 23

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 24

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 25

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

➤ Operator 26

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

$N' = \sqrt{1,897} = 3,6$ Karena nilai $N' < N$, dengan $N = 10$. Maka data telah dianggap cukup.

Kelonggaran/*Allowance Time*

➤ *Spraying*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{31}{420} = 7\% \end{aligned}$$

➤ *Mixing*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{33,5}{420} = 8\% \end{aligned}$$

➤ *Cor*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{27}{420} = 6\% \end{aligned}$$

➤ *Oven*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{32}{420} = 8\% \end{aligned}$$

➤ *Gerinding*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{23,5}{420} = 6\% \end{aligned}$$

➤ *Finishing*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{30,7}{420} = 7\% \end{aligned}$$

➤ *QC*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{34}{420} = 8\% \end{aligned}$$

➤ *Packing*

$$\begin{aligned} \textit{Allowance Time} (\%) &= \frac{\textit{Total waktu allowance time}}{\textit{Jam kerja}} \\ &= \frac{51,7}{420} = 12\% \end{aligned}$$

Perhitungan Waktu Normal

- *Spraying*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 14,8 \times 1,21$$

$$= 17,91 \text{ menit/unit}$$
- *Mixing*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 10,75 \times 1,23$$

$$= 13,22 \text{ menit/unit}$$
- *Cor*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 334,5 \times 1,25$$

$$= 418,13 \text{ menit/unit}$$
- *Oven*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 16,15 \times 1,23$$

$$= 19,86 \text{ menit/unit}$$
- *Gerinding*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 14,8 \times 1,21$$

$$= 17,91 \text{ menit/unit}$$
- *Finishing*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 34,52 \times 1,25$$

$$= 43,15 \text{ menit/unit}$$
- *QC*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 11,1 \times 1,24$$

$$= 17,91 \text{ menit/unit}$$
- *Packing*

$$Wn = \bar{X} \times \text{Performance Rating } \%$$

$$= 43,5 \times 1,21$$

$$= 52,64 \text{ menit/unit}$$

Waktu Standar

➤ *Spraying*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 17,91 \times \frac{100\%}{100\% - 7\%} = 19,05 \text{ menit/unit} \end{aligned}$$

➤ *Mixing*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 13,22 \times \frac{100\%}{100\% - 8\%} = 14,37 \text{ menit/unit} \end{aligned}$$

➤ *Cor*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 31,37 \times \frac{100\%}{100\% - 6\%} = 33,37 \text{ menit/unit} \end{aligned}$$

➤ *Oven*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 418,13 \times \frac{100\%}{100\% - 8\%} = 454,49 \text{ menit/unit} \end{aligned}$$

➤ *Gerinding*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 19,86 \times \frac{100\%}{100\% - 6\%} = 21,13 \text{ menit/unit} \end{aligned}$$

➤ *Finishing*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 43,15 \times \frac{100\%}{100\% - 7\%} = 46,40 \text{ menit/unit} \end{aligned}$$

➤ *QC*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 13,76 \times \frac{100\%}{100\% - 8\%} = 14,96 \text{ menit/unit} \end{aligned}$$

➤ *Packing*

$$\begin{aligned} \text{Waktu Standar (Ws)} &= Wn \times \frac{100\%}{100\% - \%allowance} \\ &= 52,64 \times \frac{100\%}{100\% - 7\%} = 59,82 \text{ menit/unit} \end{aligned}$$

Output Standar

➤ *Spraying*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{19,26} \times 420 = 21,81 \text{ unit}$$

➤ *Mixing*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{14,37} \times 420 = 29,23 \text{ unit}$$

➤ *Cor*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{33,37} \times 420 = 12,59 \text{ unit}$$

➤ *Oven*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{454,49} \times 420 = 0,92 \text{ unit}$$

➤ *Gerinding*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{21,13} \times 420 = 19,88 \text{ unit}$$

➤ *Finishing*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{46,40} \times 420 = 9,05 \text{ unit}$$

➤ *QC*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{14,96} \times 420 = 28,07 \text{ unit}$$

➤ *Packing*

$$OS = \frac{1}{\text{waktu standar}} \times \text{waktu kerja}$$

$$= \frac{1}{59,82} \times 420 = 7,02 \text{ unit}$$

Pembulatan Nilai Output Standar

➤ *Spraying*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{21-21,81}{21} \times 100\% = -3,85\%$$

$$P(r) = 100\% - (-3,85)\% = 103,85\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{22-21,84}{22} \times 100\% = 0,86\%$$

$$P(r) = 100\% - 0,86\% = 99,14\%$$

➤ *Mixing*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{29-29,23}{29} \times 100\% = -0,79\%$$

$$P(r) = 100\% - (-0,75)\% = 100,75\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{30-29,23}{30} \times 100\% = 2,5\%$$

$$P(r) = 100\% - 2,5\% = 97,5\%$$

➤ *Cor*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{12-12,59}{12} \times 100\% = -4,31\%$$

$$P(r) = 100\% - (-4,31)\% = 104,31\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{13-12,59}{13} \times 100\% = 3,15\%$$

$$P(r) = 100\% - 3,15\% = 96,85\%$$

➤ *Oven*

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{1-0,92}{1} \times 100\% = 8\%$$

$$P(r) = 100\% - 8\% = 92\%$$

➤ *Gerinding*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{19-19,88}{19} \times 100\% = -4,63\%$$

$$P(r) = 100\% - (-4,63)\% = 104,63\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{20-19,88}{20} \times 100\% = 0,6\%$$

$$P(r) = 100\% - 0,6\% = 99,4\%$$

➤ *Finishing*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{9-9,05}{9} \times 100\% = -0,5\%$$

$$P(r) = 100\% - (-0,5)\% = 100,5\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{10-9,05}{10} \times 100\% = 9,5\%$$

$$P(r) = 100\% - 9,5\% = 90,5\%$$

➤ QC

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{28-28,07}{28} \times 100\% = -0,25\%$$

$$P(r) = 100\% - (-0,25)\% = 100,25\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{29-28,07}{29} \times 100\% = 3,2\%$$

$$P(r) = 100\% - 3,2\% = 96,8\%$$

➤ *Packing*

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{7-7,02}{7} \times 100\% = -0,28\%$$

$$P(r) = 100\% - (-0,28)\% = 100,28\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin dan operator sebesar:

$$P(d) = \frac{8-7,02}{8} \times 100\% = 12,25\%$$

$$P(r) = 100\% - 12,25\% = 87,75\%$$

Perhitungan Nilai TEC

➤ *Spraying*

$$N = 0,74$$

$$M = 19,26 \text{ menit}$$

$$N_1 = 1 \text{ Operator}$$

$$L = 2$$

$$K_1 = \text{Rp. } 250/\text{menit}$$

$$K_2 = \text{Rp. } 300/\text{menit}$$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+19,26) \times (250 \times 1 + 300)}{1} \\ &= \text{Rp. } 11.693 \end{aligned}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{1-0,74}{1} \times 100\% = 26\%$$

$$P(r) = 100\% - 26\% = 74\%$$

➤ *Mixing*

$$N = 0,55$$

$$M = 14,37 \text{ menit}$$

$$N_1 = 1 \text{ Operator}$$

$$L = 2$$

$$K_1 = \text{Rp. } 250/\text{menit}$$

$$K_2 = \text{Rp. } 350/\text{menit}$$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+14,37) \times (250 \times 1 + 350)}{1} \\ &= \text{Rp. } 9.832 \end{aligned}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{1-0,55}{1} \times 100\% = 45\%$$

$$P(r) = 100\% - 45\% = 55\%$$

➤ *Cor*

$$N = 1,28$$

$$M = 33,37 \text{ menit}$$

$$N_1 = 1 \text{ Operator}$$

$N_2 = 2$ Operator

$L = 2$

$K_1 = \text{Rp. } 250/\text{menit}$

$K_2 = \text{Rp. } 350/\text{menit}$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+33,37) \times (250 \times 1 + 350)}{1} \\ &= \text{Rp. } 21.222 \end{aligned}$$

$$\begin{aligned} TEC - N_2 &= (L + M) \times (K_1 \times N_2 + K_2) \\ &= (2 + 33,37) \times (250 \times 2 + 350) \\ &= \text{Rp. } 30.064 \\ TEC - N_1 &< TEC - N_2 \end{aligned}$$

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{1-1,28}{1} \times 100\% = -28\%$$

$$P(r) = 100\% - (-28)\% = 128\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{2-1,28}{2} \times 100\% = 36\%$$

$$P(r) = 100\% - 36\% = 64\%$$

➤ Oven

$N = 1,74$

$M = 45,449$ menit

$N_1 = 1$ Operator

$N_2 = 2$ Operator

$L = 2$

$K_1 = \text{Rp. } 250/\text{menit}$

$K_2 = \text{Rp. } 400/\text{menit}$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+45,449) \times (250 \times 1 + 400)}{1} \\ &= \text{Rp. } 30.672 \end{aligned}$$

$$\begin{aligned} TEC - N_2 &= (L + M) \times (K_1 \times N_2 + K_2) \\ &= (2 + 45,449) \times (250 \times 2 + 400) \\ &= \text{Rp. } 42.470 \end{aligned}$$

$$TEC - N_1 < TEC - N_2$$

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{1-1,74}{1} \times 100\% = -74\%$$

$$P(r) = 100\% - (-74)\% = 174\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{2-1,74}{2} \times 100\% = 13\%$$

$$P(r) = 100\% - 13\% = 87\%$$

➤ Gerinding

$$N = 0,81$$

$$M = 21,13 \text{ menit}$$

$$N_1 = 1 \text{ Operator}$$

$$L = 2$$

$$K_1 = \text{Rp. } 250/\text{menit}$$

$$K_2 = \text{Rp. } 300/\text{menit}$$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+21,13) \times (250 \times 1 + 300)}{1} \\ &= \text{Rp. } 12.721 \end{aligned}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{1-0,81}{1} \times 100\% = 19\%$$

$$P(r) = 100\% - 19\% = 81\%$$

➤ Finishing

$$N = 1,78$$

$$M = 46,4 \text{ menit}$$

$$N_1 = 1 \text{ Operator}$$

$$N_2 = 2 \text{ Operator}$$

$$L = 2$$

$$K_1 = \text{Rp. } 250/\text{menit}$$

$$K_2 = \text{Rp. } 300/\text{menit}$$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1} \\ &= \frac{(2+46,4) \times (250 \times 1 + 300)}{1} \\ &= \text{Rp. } 26.620 \end{aligned}$$

$$\begin{aligned} TEC - N_2 &= (L + M) \times (K_1 \times N_2 + K_2) \\ &= (2 + 46,4) \times (250 \times 2 + 300) \\ &= Rp. 38.720 \end{aligned}$$

$$TEC - N_1 < TEC - N_2$$

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{1-1,78}{1} \times 100\% = -78\%$$

$$P(r) = 100\% - (-78)\% = 178\% \text{ Overtime/lembur}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{2-1,78}{2} \times 100\% = 11\%$$

$$P(r) = 100\% - 11\% = 89\%$$

➤ QC

$$N = 0,57$$

$$M = 14,96 \text{ menit}$$

$$N1 = 1 \text{ Operator}$$

$$L = 2$$

$$K1 = Rp. 250/\text{menit}$$

$$\begin{aligned} TEC - N_1 &= \frac{(L+M) \times (K_1 \times N_1)}{N_1} \\ &= \frac{(2+14,96) \times (250 \times 1)}{1} \\ &= Rp. 4.240 \end{aligned}$$

Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{1-0,57}{1} \times 100\% = 43\%$$

$$P(r) = 100\% - 43\% = 57\%$$

➤ Packing

$$N = 2,3$$

$$M = 59,82 \text{ menit}$$

$$N1 = 2 \text{ Operator}$$

$$N2 = 3 \text{ Operator}$$

$$L = 2$$

$$K1 = Rp. 250/\text{menit}$$

$$K2 = Rp. 50/\text{menit}$$

$$TEC - N_1 = \frac{(L+M) \times (K_1 \times N_1 + K_2)}{N_1}$$

$$= \frac{(2+59,82) \times (250 \times 1 + 50)}{1}$$

$$= \text{Rp. } 34.001$$

$$TEC - N_2 = (L + M) \times (K_1 \times N_2 + K_2)$$

$$= (2 + 59,82) \times (250 \times 2 + 50)$$

$$= \text{Rp. } 49.456$$

$$TEC - N_1 < TEC - N_2$$

Karena pembulatan kebawah, maka terjadi overtime sebesar:

$$P(d) = \frac{2-2,3}{2} \times 100\% = -15\%$$

$$P(r) = 100\% - (-15)\% = 115\% \text{ Overtime/lembur}$$


Karena pembulatan keatas, maka terjadi kelangkaan mesin sebesar:

$$P(d) = \frac{3-2,3}{3} \times 100\% = 23,3\%$$

$$P(r) = 100\% - 23,3\% = 76,7\%$$

Kartu Bimbingan

JURNAL BIMBINGAN TUGAS AKHIR
PRODI TEKNIK INDUSTRI
SEMESTER GASAL 2023/2024



Nama : Natanael Setyo Krisbyadi


NBI : 191900035

Judul Penelitian : Analisis Output Standar Produk Bathub

Untuk Menentukan Jumlah Tenaga Kerja Pada Proses Produksi:

Di PT. Gracious Puatam Jaya Surabaya

Dosen Pembimbing: Dr. Ir. Sajiyo, M. Kes., IPU., ASEAN Eng.



No.	Tanggal	Materi Rimbunan	Catatan Pembimbing	Farai Pembimbing
1.	17/07/2023	Judul, latar belakang	revisi judul, latar belakang masalah	27/07/23
2.	20/07/2023	Rumusan masalah, Bab I, Metode penelitian	revisi rumusan masalah, tambah data di BAB I, minambah teori Bab I, jenis penelitian	27/07/23
3.	31/7/23	Bab. I & II	Perbaikan Bab I & II	28/07/23
4	1/8/23	Bab I & II	Perbaikan latar belakang dan Rumus analisis RT	28/07/23
5	4/8	Bab II & III	Teori Teori Koperasi dan rine study	28/07/23
6	8/8	Bab I & II	Uraian masalah	28/07/23
7			Pengukuran waktu kerja	28/07/23
8	7/8	Bab III	analisis data	28/07/23
9	10/8	BAB IV	Perbaikan uraian dan analisis	28/07/23
10			peta kerja	28/07/23
11			peta kerja & file TK	28/07/23
12	28/11	Bab V	analisis awal dan piler	28/07/23
13	1/12	Bab V & VI		28/07/23
14	4/12		journal	28/07/23

Surat Ijin Penelitian

PT. GRACIOUS PUALAM JAYA

JL. RAYA SUKODONO No. SIDOARJO – JAWA TIMUR
TELP. 8831389 – 8830390 Fak (031) 8830390

Nomor : 031/PERS/SKP-GPJ/VIII/2023 Sukodono, 29 Agustus 2023
Lampiran : -
Perihal : Konfirmasi Penelitian Tugas Akhir

Kepada Yth :
Dekan Fakultas Teknik
Universitas 17 Agustus 1945 Surabaya
Jl. Semolowaru No. 45 Surabaya

Dengan Hormat,

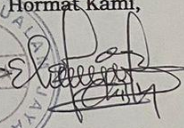
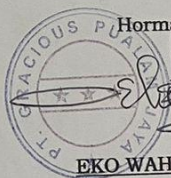
Menindaklanjuti dan membalas surat Saudara No. 1540/K/FT/Akd/VIII/2023,
Tanggal 14 Agustus 2023, Perihal Permohonan **Penelitian Tugas Akhir** yang di
ajukan atas nama Mahasiswa :

1. Natanael Setyo K
NBI : 1411900035
Program Study Teknik Industri

Kami selaku Perwakilan Management menyambut baik dan mengizinkan Mahasiswa
Tersebut untuk melakukan **Penelitian** dan kegiatan lainya yang berhubungan
dengan **Tugas Akhir** tersebut

Semua biaya yang timbul dalam pelaksanaan **Penelitian Tugas Akhir** tidak
menjadi tanggung jawab pihak perusahaan

Demikian surat pemberitahuan kami, atas kepercayaan saudara kepada
perusahaan ini kami ucapkan terima kasih

Hormat Kami,


EKO WAHYUDIONO, ST
Assist. Factory Manager

Lembar Revisi Sidang TA

UNIVERSITAS 17 AGUSTUS 1945 SURABAYA
 FAKULTAS TEKNIK
 PROGRAM STUDI TEKNIK INDUSTRI

REVISI SIDANG TUGAS AKHIR

NAMA
 NBI
 JUDUL

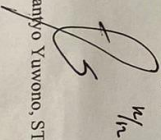
: Natanael Setyo Kristyadi
 : 1411900035
 : ANALISIS OUTPUT STANDAR PRODUK BATHUB UNTUK MENENTUKAN JUMLAH TENAGA KERJA PADA PT. GRACIOUS PUJALAMAJAYA SURABAYA

BATAS BIMBINGAN REVISI : 1 Minggu setelah Sidang

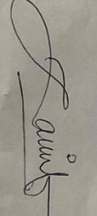
NO	URAIAN	BAB	HALAMAN
1.	Definisi direksi?		
2.	Artinya langsung tanggapi den & permasalahan tersebut.		

NO	URAIAN	BAB	HALAMAN
1.	Tabel ditanyakan sebelumnya.		
2.	Kemungkinan di jelaskan dari 13 pelagra menjadi 2 orang (banyak pagelaran Riwayan).		

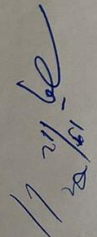
Telah Direvisi,
 Dosen Penguji 1,


 Istamyo Yuwono, ST., MM

Dosen Penguji 2,


 Siti Mubinnatul Khoirah, ST., MF
 Dr. F. Rahmat Andri, MT

Surabaya, 07 Desember 2023
 Mengetahui
 Dosen Pembimbing/Ketua Penguji,


 Dr. Ir. Saizyo, M.Kes., IPU, ASEAN Eng

(Halaman ini sengaja dikosongkan)

BIOGRAFI



Penulis Bernama Natanael Setyo Kristyadi lahir di Sorong, 13 Juni 2001. Penulis merupakan anak tunggal. Penulis menempuh Pendidikan terakhir di SMA Negeri 1 Kabupaten Sorong, kemudian melanjutkan pendidikannya di Universitas 17 Agustus 1945 Surabaya – Program Studi Teknik Industri, penulis memiliki hobby bermain musik dan fotografi, semasa di bangku perkuliahan penulis aktif menjadi anggota di organisasi Unit Kegiatan Mahasiswa Kerohanian Kristen Katolik Universitas 17 Agustus 1945 Surabaya