_Report

Test whether Data Distribution is Normal

Graph -> Probability Plot -> Single

Variables: Delivery Time1 , Delivery Time 2
Display on separate panels of the same graph
Distribution: Normal

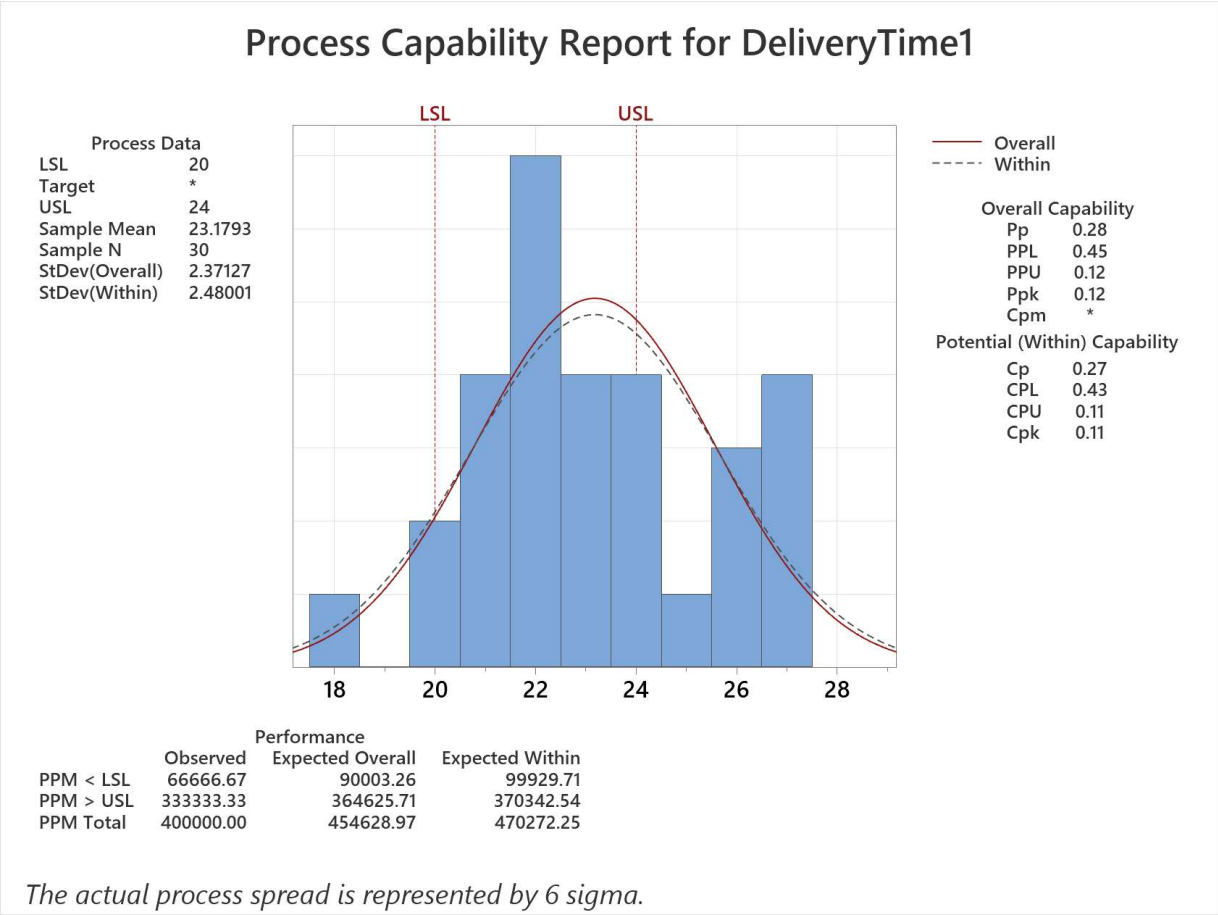
RESULTS:
p-value is larger than 0.05, therefore, fail to reject the null hypothesis: data is normally distributed

Process Capability Normal

Stat-> Quality Tools -> Capability Analysis -> Normal
Single column: Delivery time1
Subgroup Size: 1
Low spec: 20

Upper spec: 24

RESULTS:
About 40% of the deliveries exceed 24 hours: process is not well controlled
Cpk<1 means process is capable of meeting specifications



The actual process spread is represented by 6 sigma.

Process Capability Between and Within

For data that was created in subgroups (for example, data collected for 5 consecutive samples for 30 runs)
Within subgroup variation is common cause variation
Between subgroup variation is special-cause variation

Stat-> Quality Tools -> Capability Analysis -> Between/Within
Single column: Length
Subgroup Size: Sample
Low spec: 15
Upper spec: 25

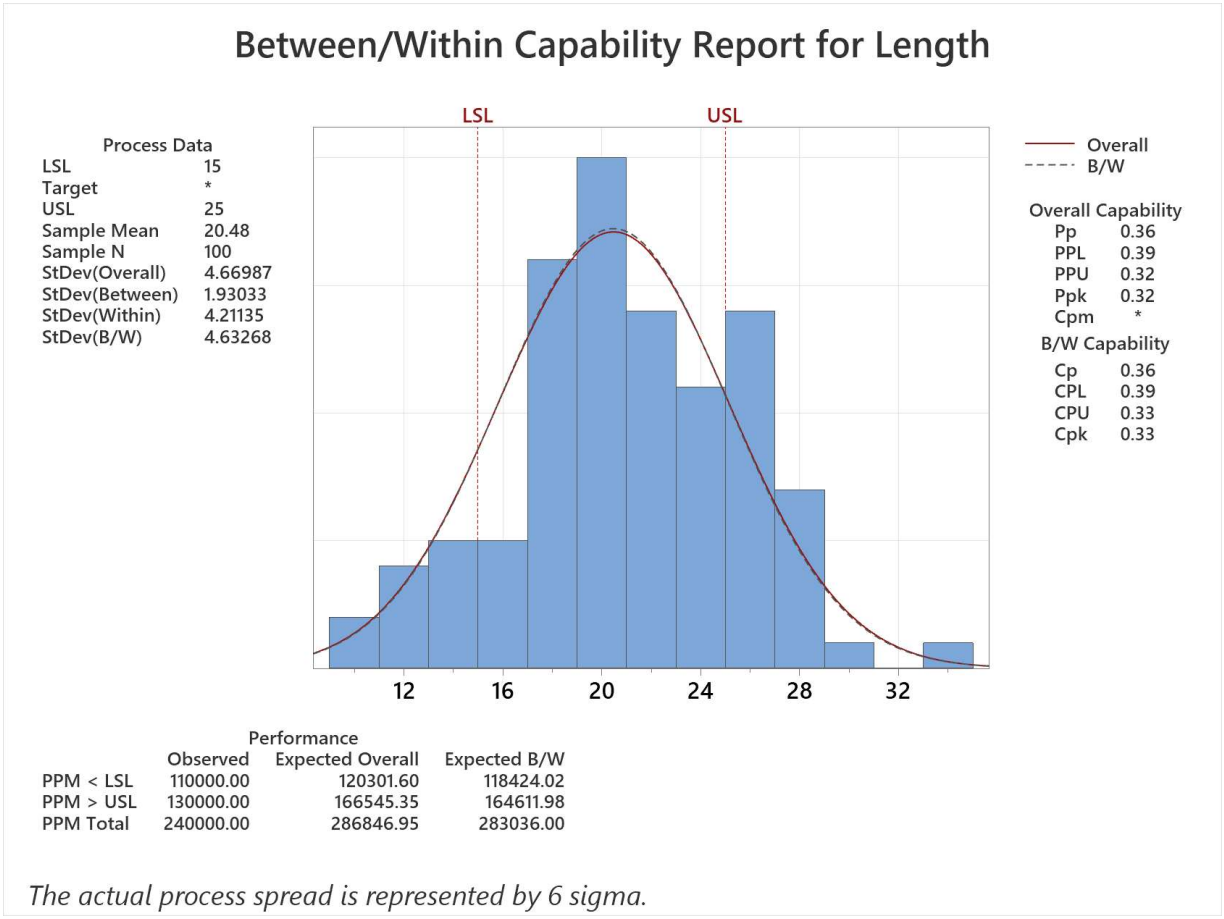
Options -> Display: Parts per Million or percent, Capability stats

RESULTS:
Potential capability Cp = 0.36
CPL and CPU are potential capabilities for lower and upper spec
Actual process capability Cpk = 0.33

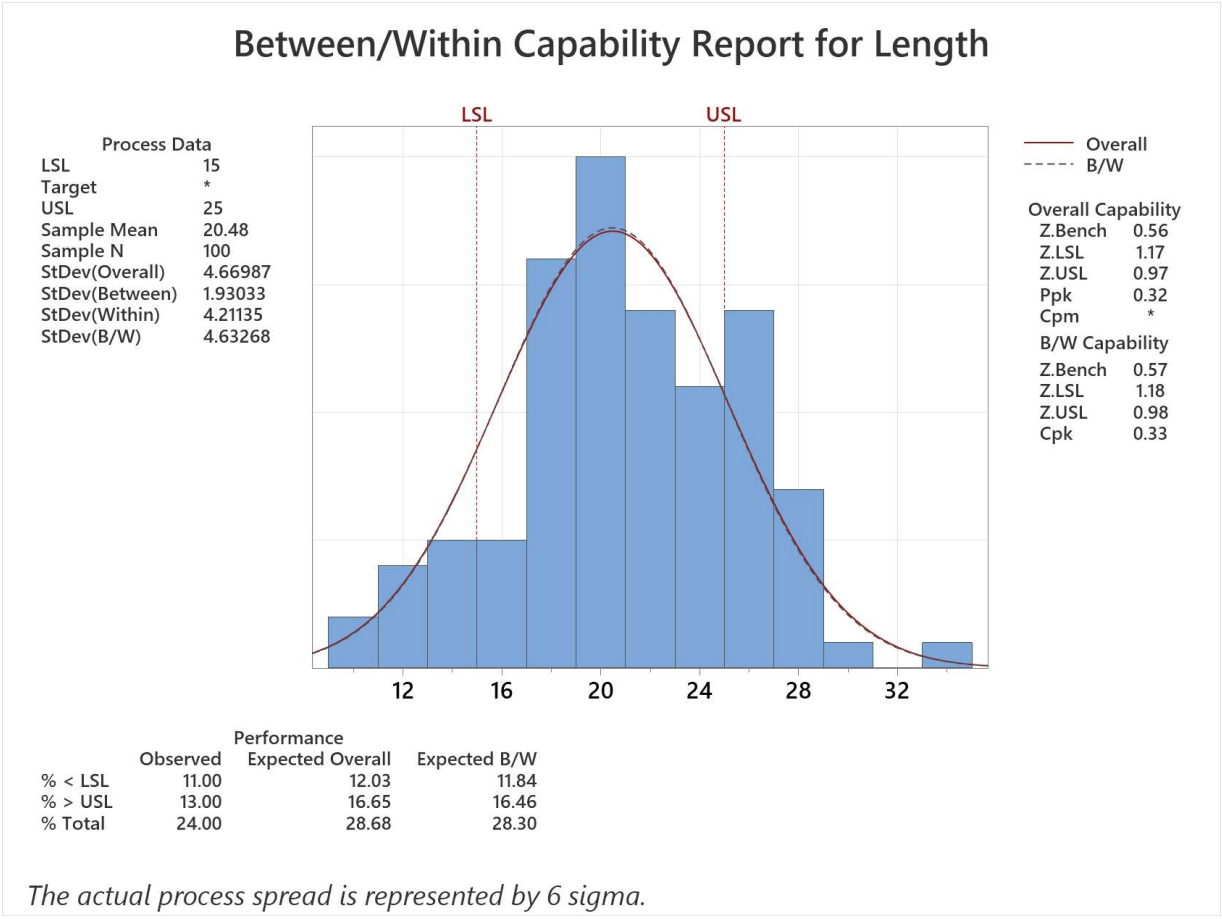
ppm of defect rates range is listed in Expected B/W (divide by 1 million to get 28.3% defect rate)
This is the defect rate that can be achieved if variation from systemic sources and between/within subgroup will be eliminated

CTRL/E to edit:
Options -> Display: Percent, Benchmark Z's

Z bench = 0.56
Sigma level = 1.5 + Z bench overall
To account for process shifts in the long run, add 1.5 to convert to Sigma levels



The actual process spread is represented by 6 sigma.



The actual process spread is represented by 6 sigma.

Test whether Data Distribution is Normal

Graph -> Probability Plot -> Single

Variables: Delivery Time

Distribution: Normal, then try CTRL/E Weibull

RESULTS:
Normal Distribution: p-value is less than 0.05, therefore, accept the null hypothesis: data is not normally distributed
Weibull Distribution: p-value larger than 0.05, therefore this is a good fit.


Probability Plot of Delivery time
Normal - 95% CI
Mean 1.790
StDev 2.168
N 100
AD 8.044
P-Value <0.005
Percent
99.9
99
95
90
80
70
60
50
40
30
20
10
5
1
0.1
-5
0
5
10
15
Delivery time


Probability Plot of Delivery time
Weibull - 95% CI
Shape 0.9217
Scale 1.719
N 100
AD 0.492
P-Value 0.224
Percent
99.9
99
90
80
70
60
50
40
30
20
10
5
3
2
1
0.1
0.0001
0.001
0.01
0.1
1
10
Delivery time

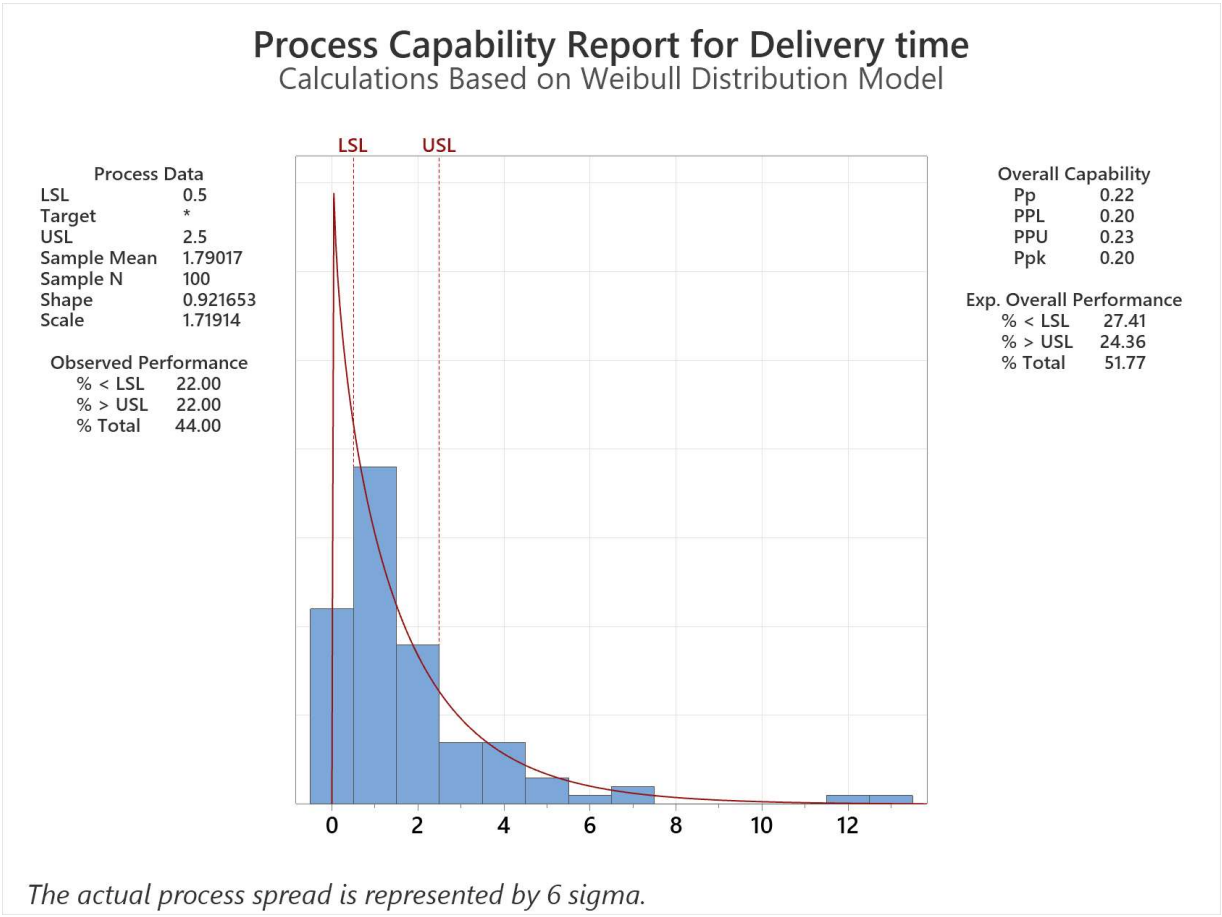
Process Capability Nonnormal

Stat-> Quality Tools -> Capability Analysis -> Nonnormal
Fit Distribution: Weibull
Single column: Length
Subgroup Size: Sample
Low spec: 0.5
Upper spec: 2.5
Options -> Display: Percent, Capability stats

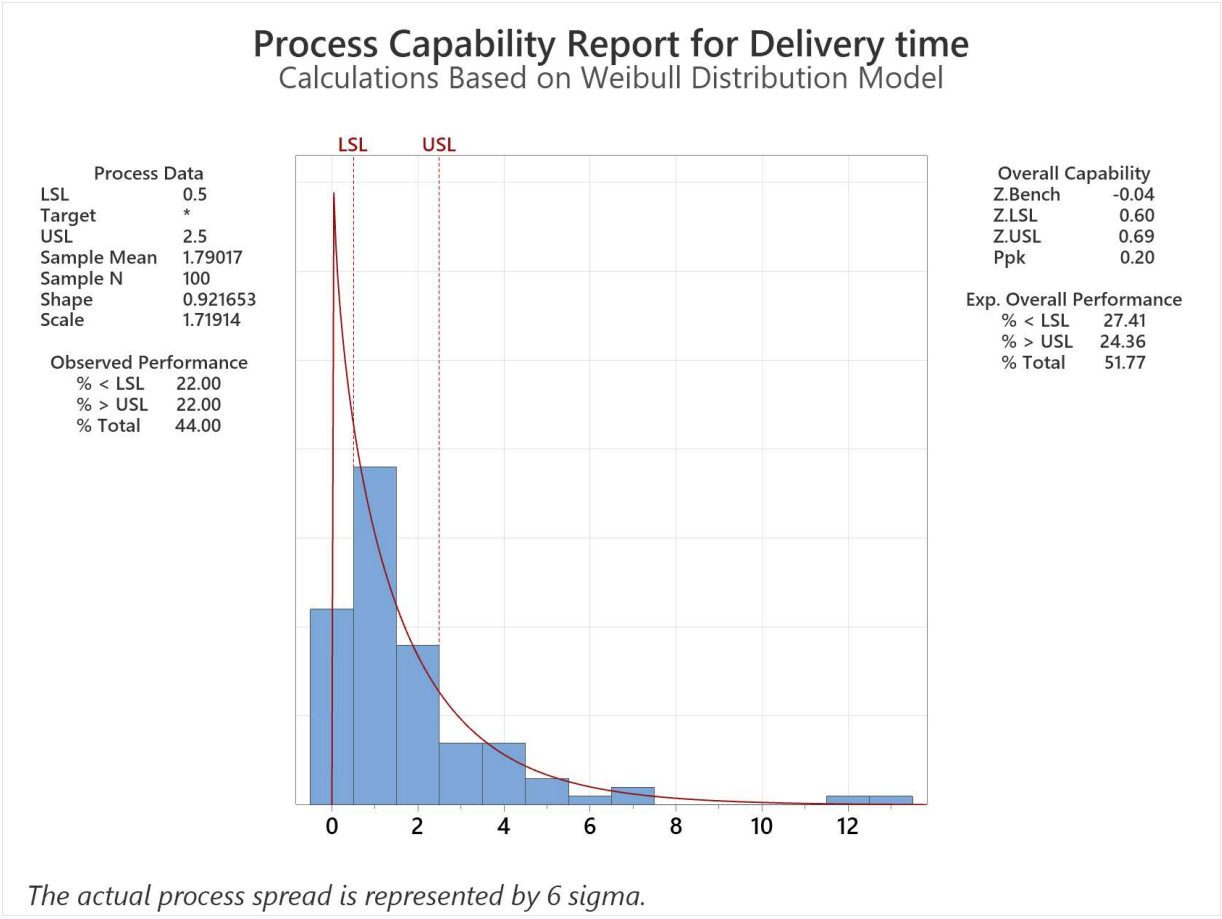
RESULTS:
Observed performance of the defect rate is 44%
The expected performance in the long run has defect rate of 51.77%
Potential overall capability Pp = 0.22
Actual overall capability Ppk = 0.20

CTRL/E to edit:
Options -> Display: Percent, Benchmark Z's

Z bench = -0.04
Sigma level = 1.5 + (-0.04)= 1.46



The actual process spread is represented by 6 sigma.



The actual process spread is represented by 6 sigma.

Binomial Distribution:

Examples: yes/no, pass/fail, distinct bands

Stat-> Quality Tools -> Capability Analysis -> Binomial

Defectives: Rejects

Use sizes in : Sampled

Target: 10

Tests: Perform all tests

RESULTS:

P Chart shows no out of control conditions.

This process is in control: stable and predictable.

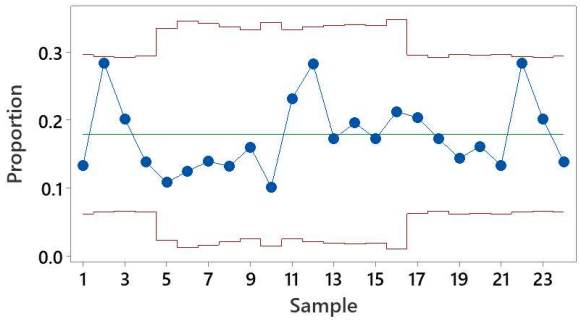
% Defective = 17.94%

Process Z = 0.9175

To discount process shifts +1.5 = 2.4175

Binomial Process Capability Report for Rejects

P Chart

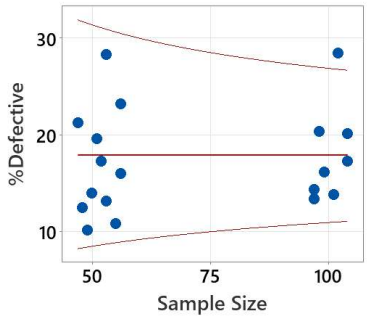


UCL=0.2940

$\bar{P}$=0.1794

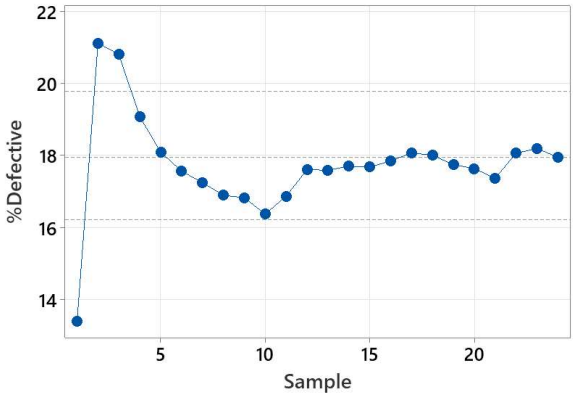
LCL=0.0649

Rate of Defectives



Tests are performed with unequal sample sizes.

Cumulative %Defective



Summary Stats
(95.0% confidence)

%Defective:	17.94
Lower CI:	16.21
Upper CI:	19.78
Target:	10.00
PPM Def:	179431
Lower CI:	162093
Upper CI:	197804
Process Z:	0.9175
Lower CI:	0.8495
Upper CI:	0.9859

Histogram