_Report

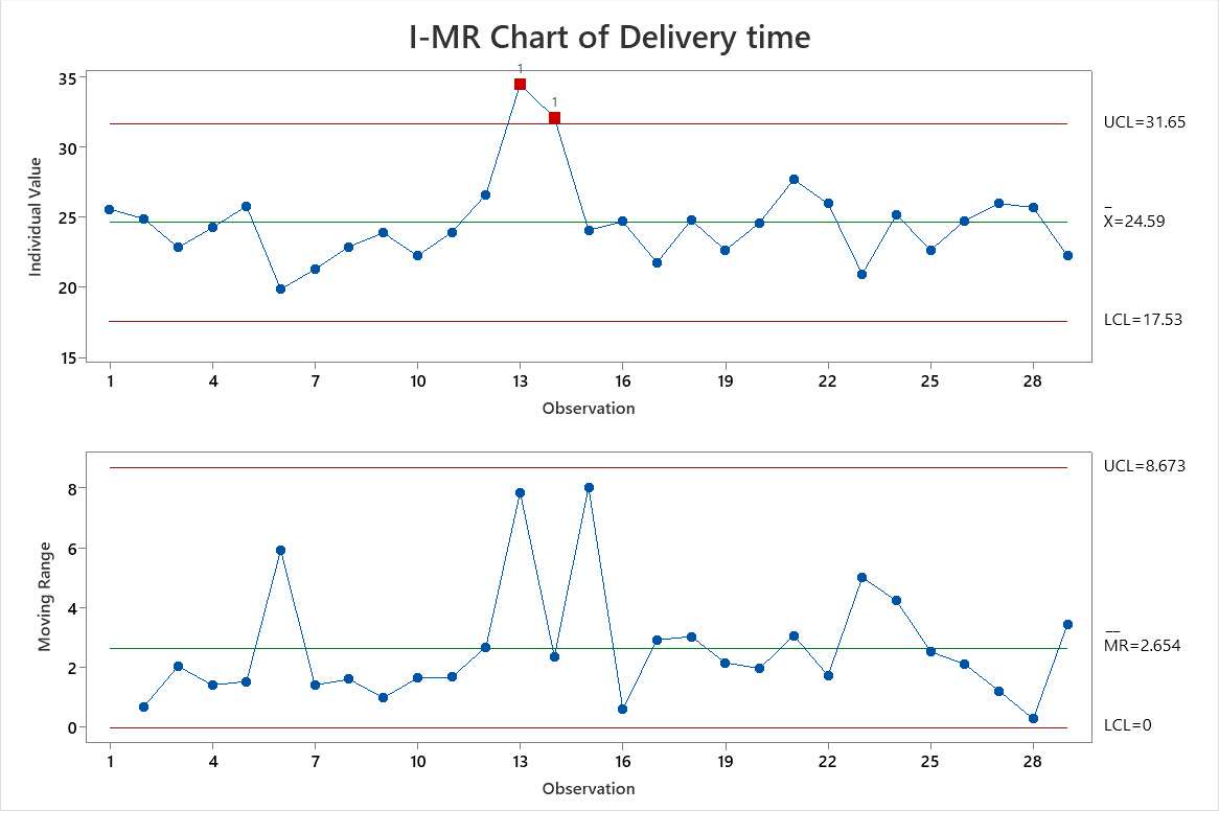
Statistical Process Control (SPC)

Analyze for non-random or special cause variations happen.

I-MR Chart

Stat -> Control Charts -> Variable Charts for Individuals -> I-MR
Select variable (single column of measurements)
Select I-MR options -> Tests (check that all applies)

RESULT: process is not in control



Test Results for I Chart of Delivery time

TEST 1. One point more than 3.00 standard deviations from center line.
Test Failed at points: 13, 14

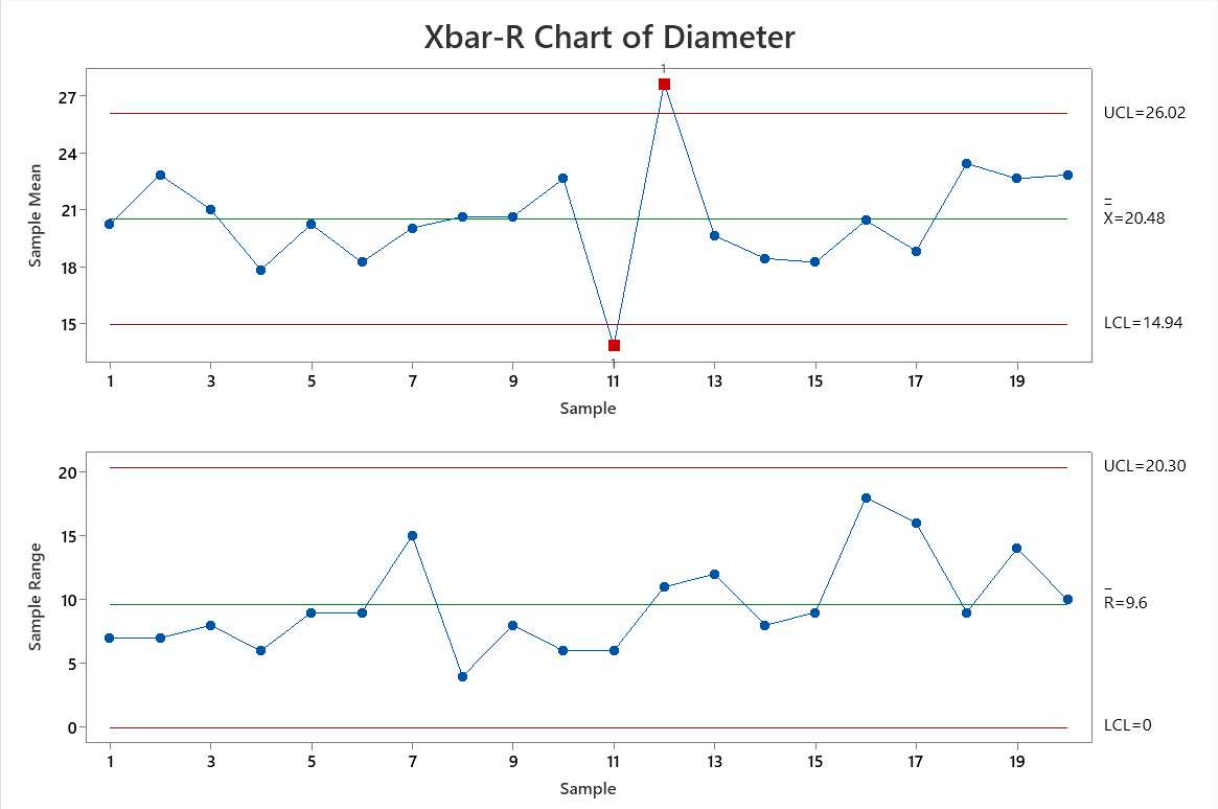
TEST 5. 2 out of 3 points more than 2 standard deviations from center line (on one side of CL).
Test Failed at points: 14

Xbar-R

Used for repetitive process. Sensitive for tracking and identifying causes.
Xbar =Average of samples
R= range of value within a sample

Stat -> Control Charts -> Variable Charts for Subgroups ->Xbar-R
Select Diameter as a variable
Select Sample as Subgroup sizes.
Select Xbar-R Options and all tests.

RESULT: process is not in control



Test Results for Xbar Chart of Diameter

TEST 1. One point more than 3.00 standard deviations from center line.
Test Failed at points: 11, 12

Xbar-S

Used for repetitive process. Sensitive for tracking and identifying causes.

Xbar =Average of samples

S= standard deviation within a sample

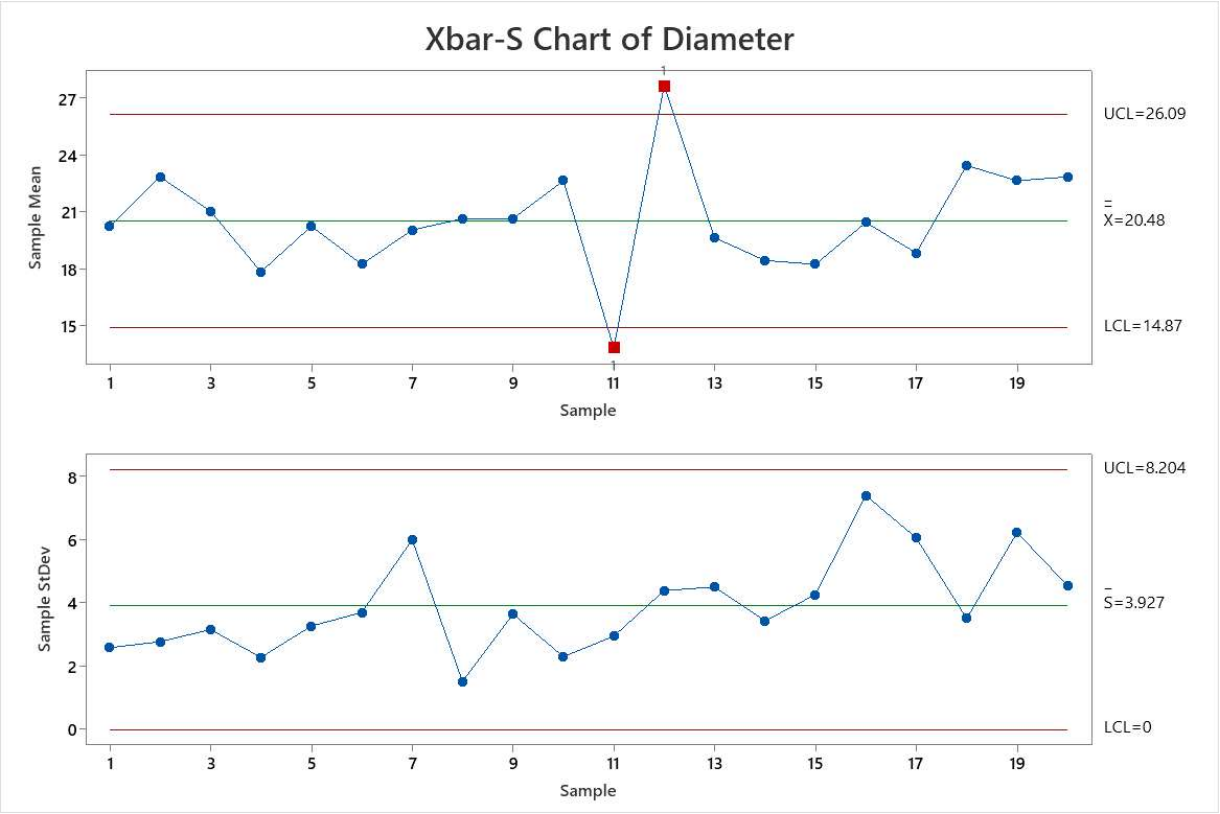
Stat -> Control Charts -> Variable Charts for Subgroups->Xbar-S

Select Diameter as a variable

Select Sample as Subgroup sizes.

Select Xbar-S Options and all tests.

RESULT: process is not in control (same as Xbar-R)



Test Results for Xbar Chart of Diameter

TEST 1. One point more than 3.00 standard deviations from center line.

Test Failed at points: 11, 12

Charts for Attributes

C chart = number of defects

U chart = number of defects per unit

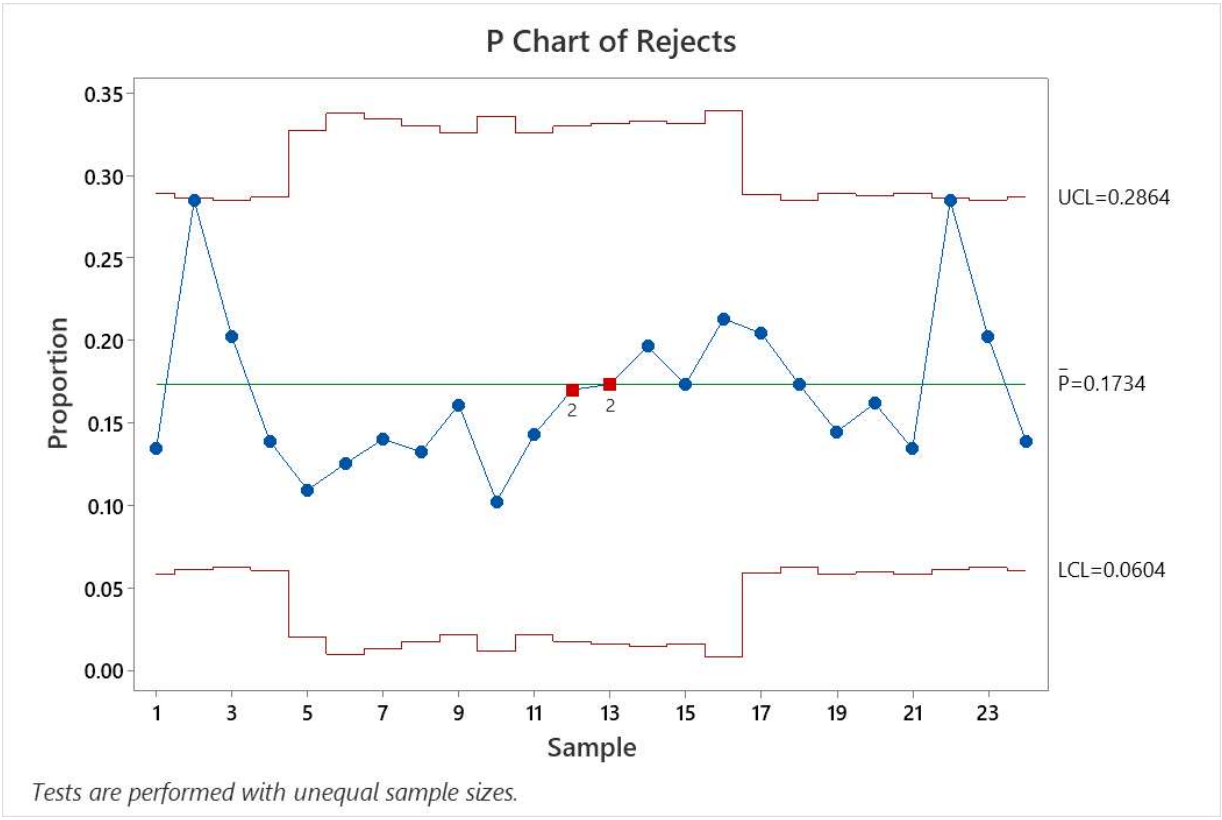
P chart = proportion of defective items

NP chart = number of defective items

P chart

Stat -> Control Charts -> Attributes Charts ->P
Select Reject as a variable
Select Sampled as Subgroup sizes.
Select Options and all tests.

RESULT: 2 points failed. Process is not in control



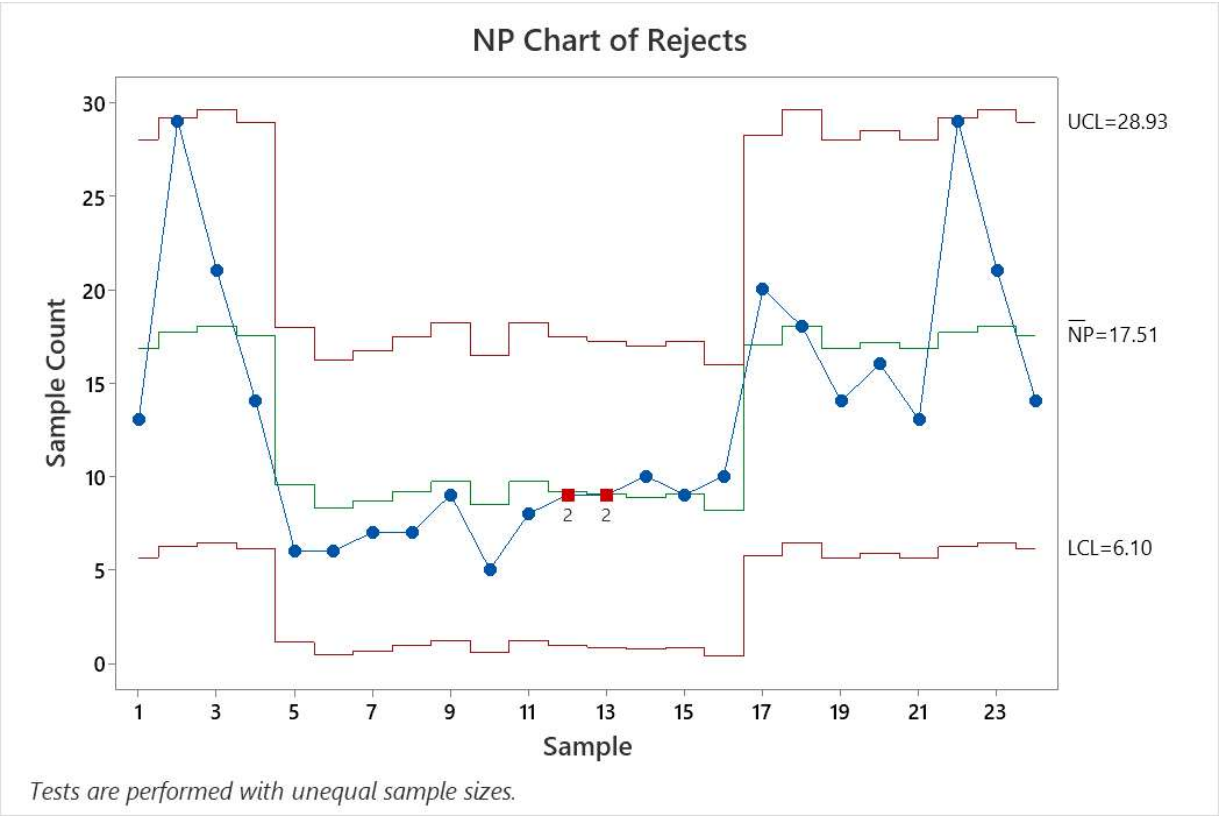
Test Results for P Chart of Rejects

TEST 2. 9 points in a row on same side of center line.
Test Failed at points: 12, 13

NP chart

Stat -> Control Charts -> Attributes Charts ->NP
Select Reject as a variable
Select Sampled as Subgroup sizes.
Select Options and all tests.

RESULT: 2 points failed. Process is not in control



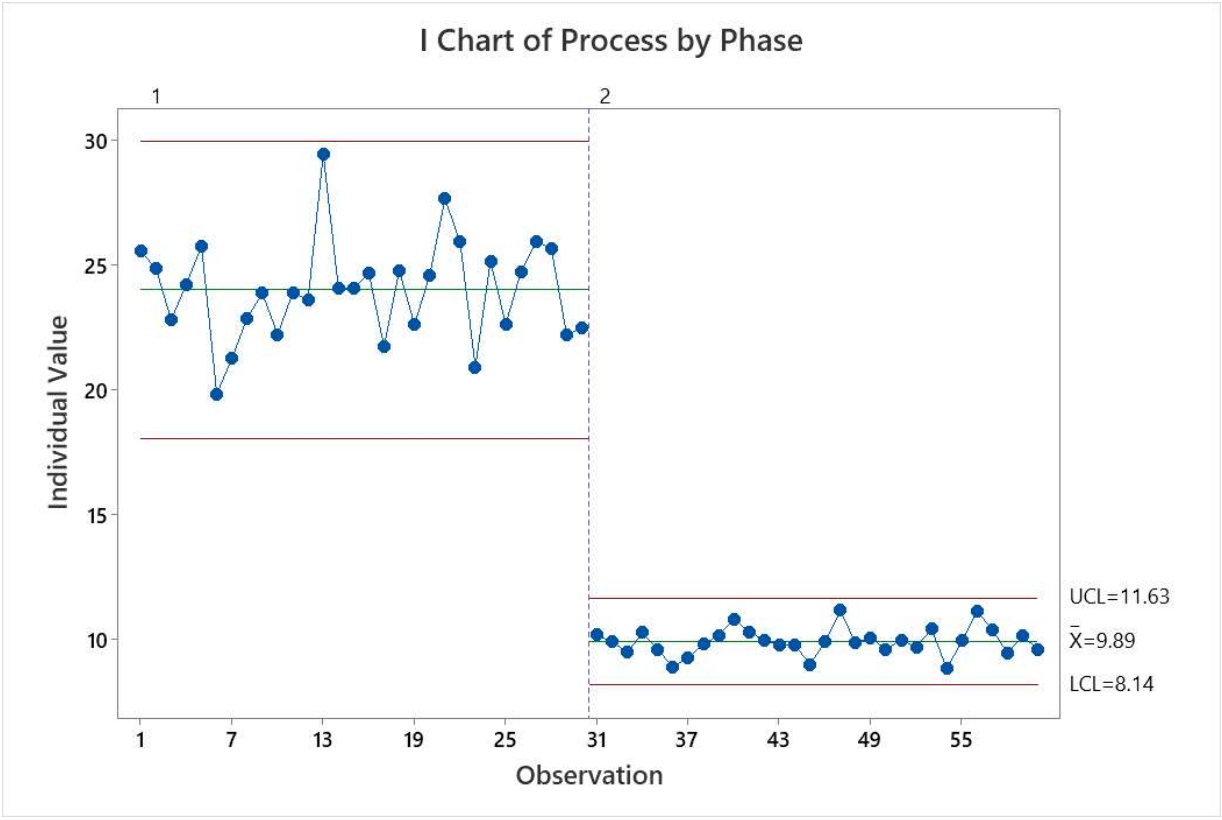
Test Results for NP Chart of Rejects

TEST 2. 9 points in a row on same side of center line.
Test Failed at points: 12, 13

Individuals chart (I Chart of Process)

Stat -> Control Charts -> Variable Charts for Individuals -> Individuals
Select Process as Variable.
Select Options -> Stages , enter Phase , "with first occurrence of these values" and enter Phase # (ie 2)
Phase 1 and 2 = part of the process before (1) and after (2) the change

RESULT: Process significantly improved in the second stage


I Chart of Process by Phase
1
2
Individual Value
30
25
20
15
10
1
7
13
19
25
31
37
43
49
55
Observation
UCL=11.63
X̄=9.89
LCL=8.14