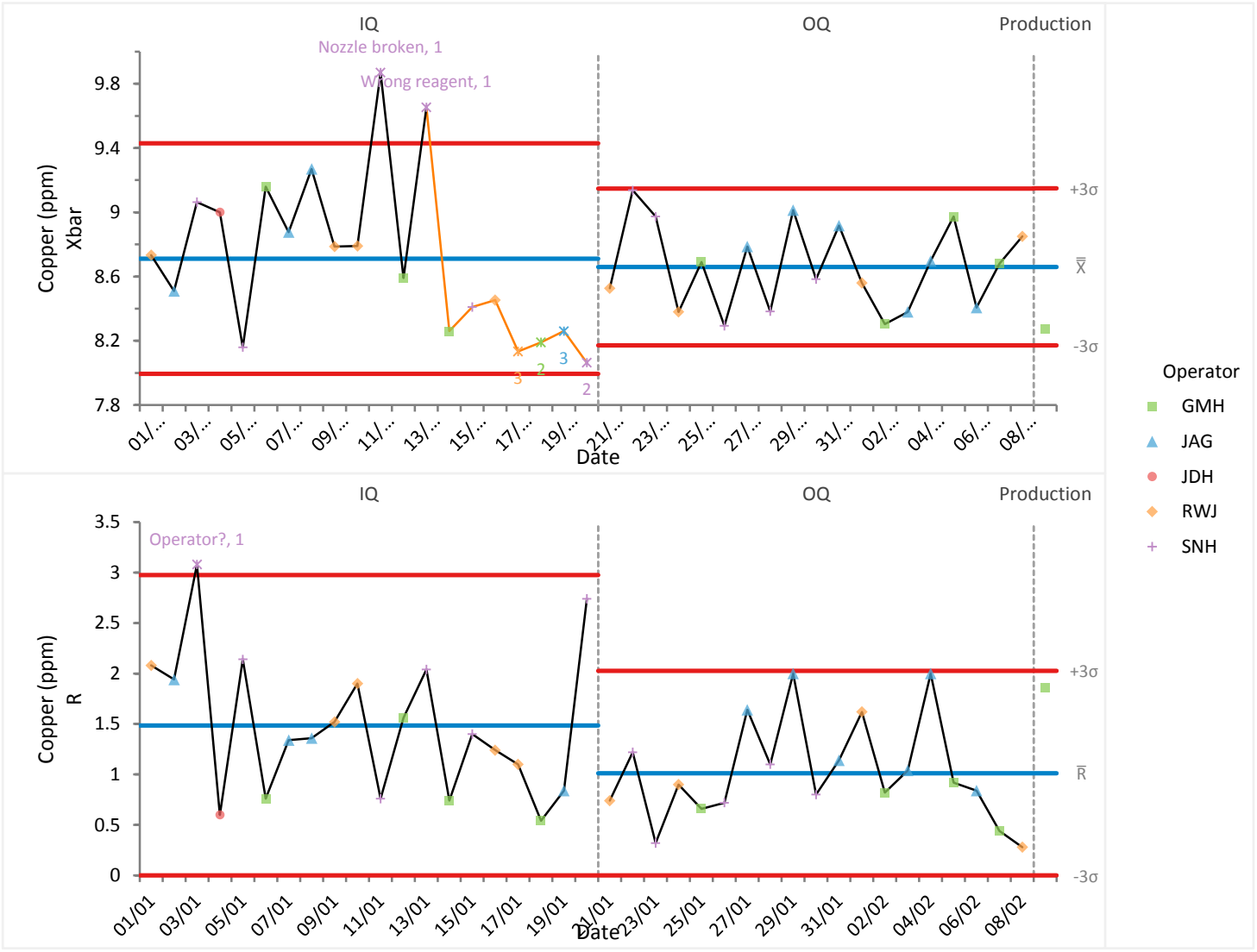
Process Control: Copper

Copper concentration in plating pool

Last updated 2 February 2016 at 7:49 by Analyse-it Software, Ltd.

Control



Montgomery rules: 1, 2, 3, 5, 8 applied to Xbar statistic.

Out-of-control signals

Phase	Date	Statistic	Value	Broken rule
IQ	03/01	R	3.08	1
IQ	11/01	Xbar	9.87	1
IQ	13/01	Xbar	9.65	1
IQ	17/01	Xbar	8.13	3
IQ	18/01	Xbar	8.19	2
IQ	19/01	Xbar	8.26	3
IQ	20/01	Xbar	8.06	2

1: 1 point is outside the control limits.
2: 2 out of 3 consecutive points are more than 2 sigma from the center line in the same direction.
3: 4 out of 5 consecutive points are more than 1 sigma from the center line in the same direction.

Process Control: Copper

Copper concentration in plating pool

Last updated 2 February 2016 at 7:49 by Analyse-it Software, Ltd.

Process parameters

Copper (ppm) by Phase	Mean	Sigma
IQ	8.712	0.586 [3]
OQ	8.660	0.399 [3]
Production	8.660 [1]	0.399 [2]

[1] Mean known.
[2] Sigma known.
[3] Sigma estimated by Rbar.

Process control statistics

Statistic	Phase	Sample size	Centre	±3-sigma limits
Xbar	IQ	6	8.712	7.994 to 9.429
Xbar	OQ	6	8.660	8.171 to 9.148
Xbar	Production	6	8.660	8.171 to 9.149
R	IQ	6	1.484	0.000 to 2.974
R	OQ	6	1.011	0.000 to 2.025
R	Production	6	1.011	0.000 to 2.026

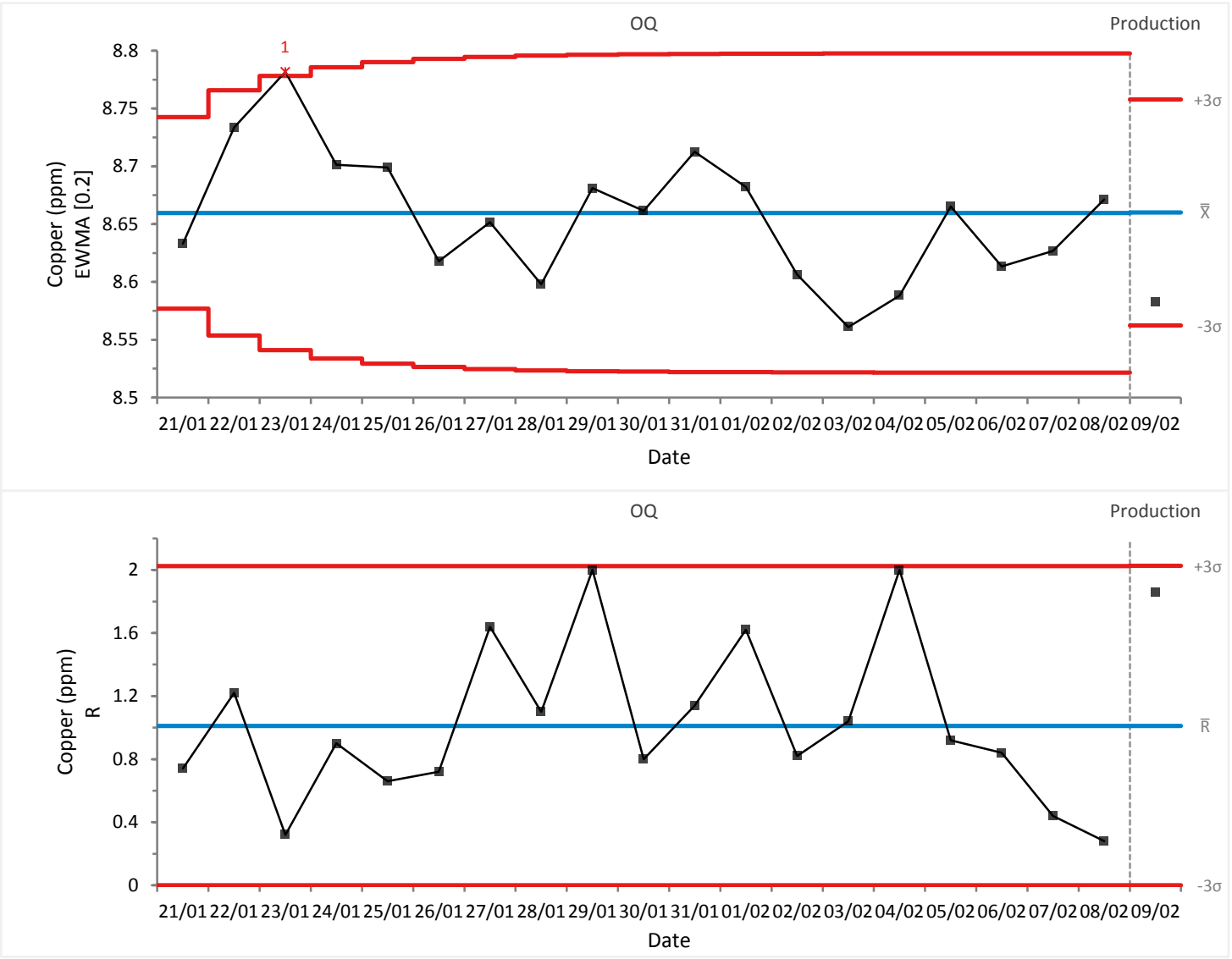
Process Control: Copper

Analyse-it v4.60

Copper concentration in plating pool

Last updated 2 February 2016 at 7:55 by Analyse-it Software, Ltd.

Control



Out-of-control signals

Phase	Date	Statistic	Value	Broken rule
OQ	23/01	EWMA	8.78	1

1: 1 point is outside the control limits.

Process parameters

Copper (ppm) by Phase	Mean	Sigma
OQ	8.660	0.338 [3]
Production	8.660 [1]	0.399 [2]

[1] Mean known.
[2] Sigma known.
[3] Sigma estimated by Rbar.

Process Control: Copper

Analyse-it v4.60

Copper concentration in plating pool

Last updated 2 February 2016 at 7:55 by Analyse-it Software, Ltd.

Process control statistics

Statistic	Phase	Sample size	Centre	±3-sigma limits
R	OQ	6	1.011	0.000 to 2.025
R	Production	6	1.011	0.000 to 2.026

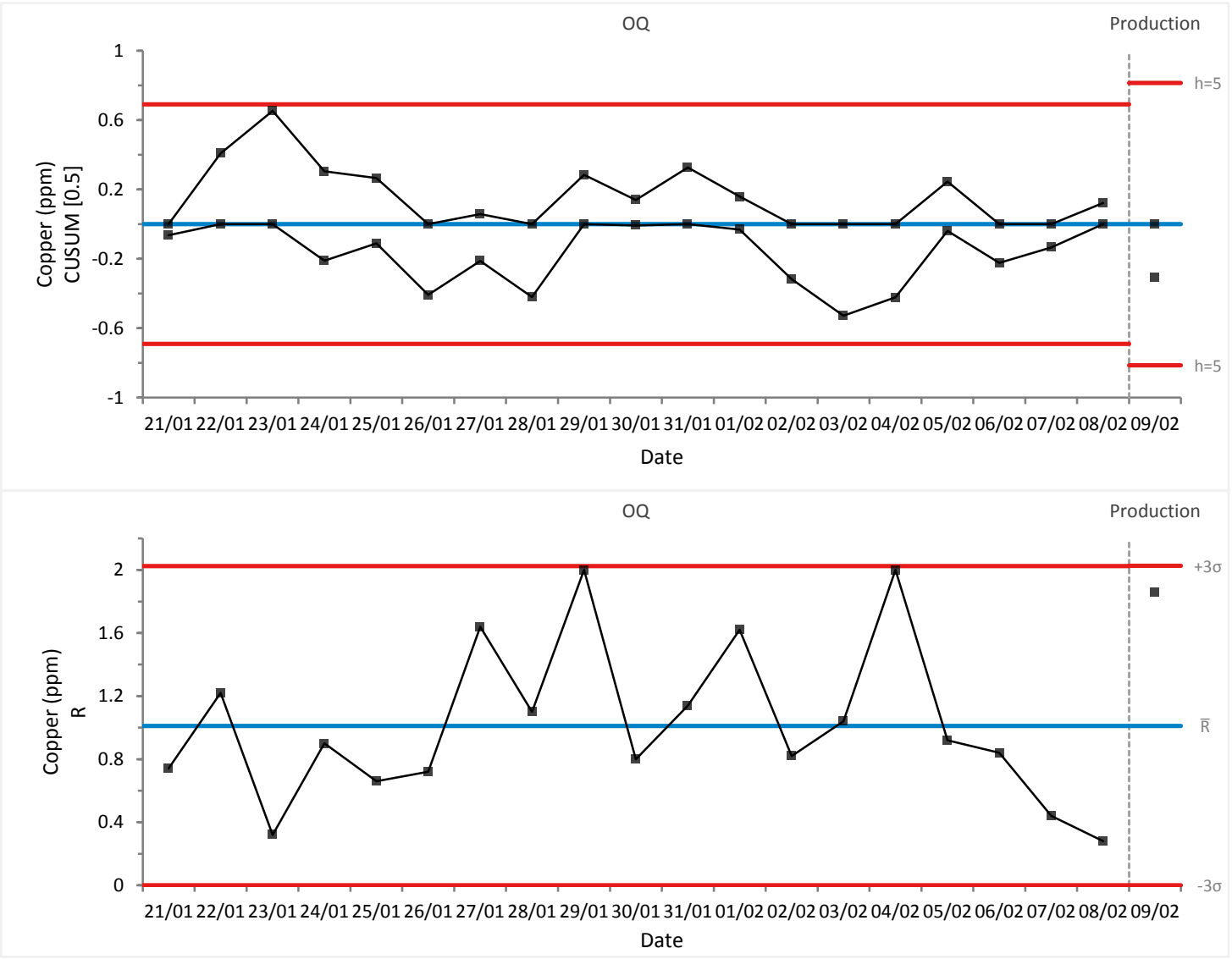
Statistic	L	Weight
EWMA	3	0.2

Process Control: Copper

Copper concentration in plating pool

Last updated 2 February 2016 at 7:55 by Analyse-it Software, Ltd.

Control



Process parameters

Copper (ppm) by Phase	Mean	Sigma
OQ	8.660	0.338 [3]
Production	8.660 [1]	0.399 [2]

[1] Mean known.
[2] Sigma known.
[3] Sigma estimated by Rbar.

Process Control: Copper

Analyse-it v4.60

Copper concentration in plating pool

Last updated 2 February 2016 at 7:55 by Analyse-it Software, Ltd.

Process control statistics

Statistic	Phase	Sample size	Centre	±3-sigma limits
R	OQ	6	1.011	0.000 to 2.025
R	Production	6	1.011	0.000 to 2.026

Statistic	h	k
CUSUM	5	0.5

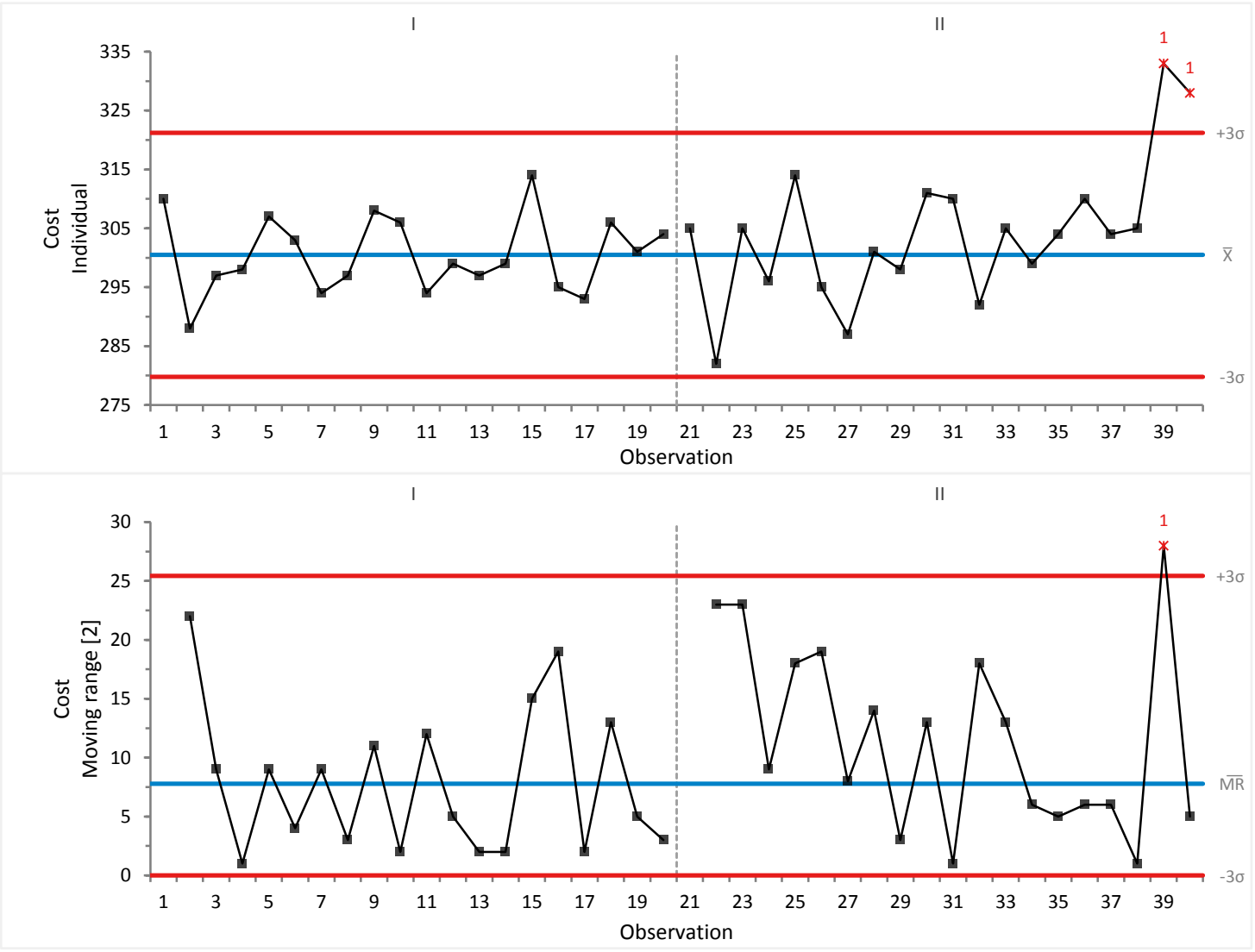
Process Control: Cost

Analyse-it v4.60

Loan processing costs (from Montgomery page 268)

Last updated 2 February 2016 at 8:08 by Analyse-it Software, Ltd.

Control



Out-of-control signals

Phase	Observation	Statistic	Value	Broken rule
II	39	Moving range	28	1
II	39	Individual	333	1
II	40	Individual	328	1

1: 1 point is outside the control limits.

Process parameters

Cost by Phase	Mean	Sigma
I	300.5 [1]	6.9 [2]
II	300.5 [1]	6.9 [2]

[1] Mean known.

[2] Sigma known.

Process Control: Cost

Loan processing costs (from Montgomery page 268)

Last updated 2 February 2016 at 8:08 by Analyse-it Software, Ltd.

Process control statistics

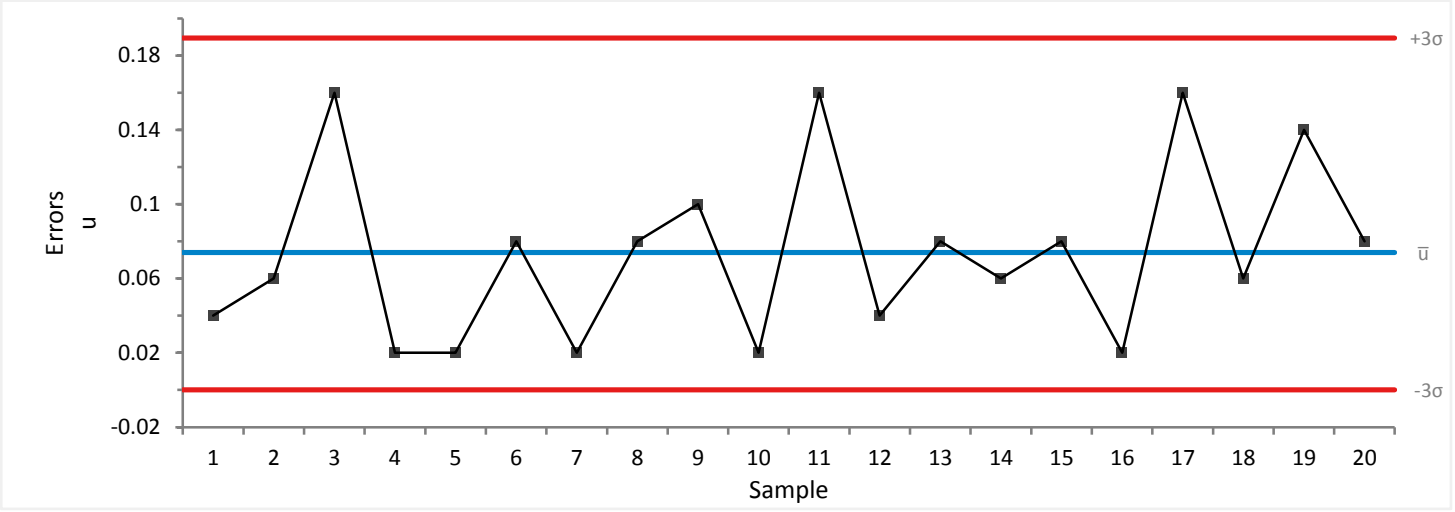
Statistic	Phase	Sample size	Centre	±3-sigma limits
Individual	I	1	300.5	279.8 to 321.2
Individual	II	1	300.5	279.8 to 321.2
Moving range	I	2	7.8	0.0 to 25.4
Moving range	II	2	7.8	0.0 to 25.4

Process Control: Errors

Supply chain operations (from Montgomery page 325)

Last updated 2 February 2016 at 8:09 by Analyse-it Software, Ltd.

Control



Process parameters

	Mean
Errors	0.0740

Process control statistics

Statistic	Sample size	Centre	±3-sigma limits
u	50	0.0740	0.0000 to 0.1894

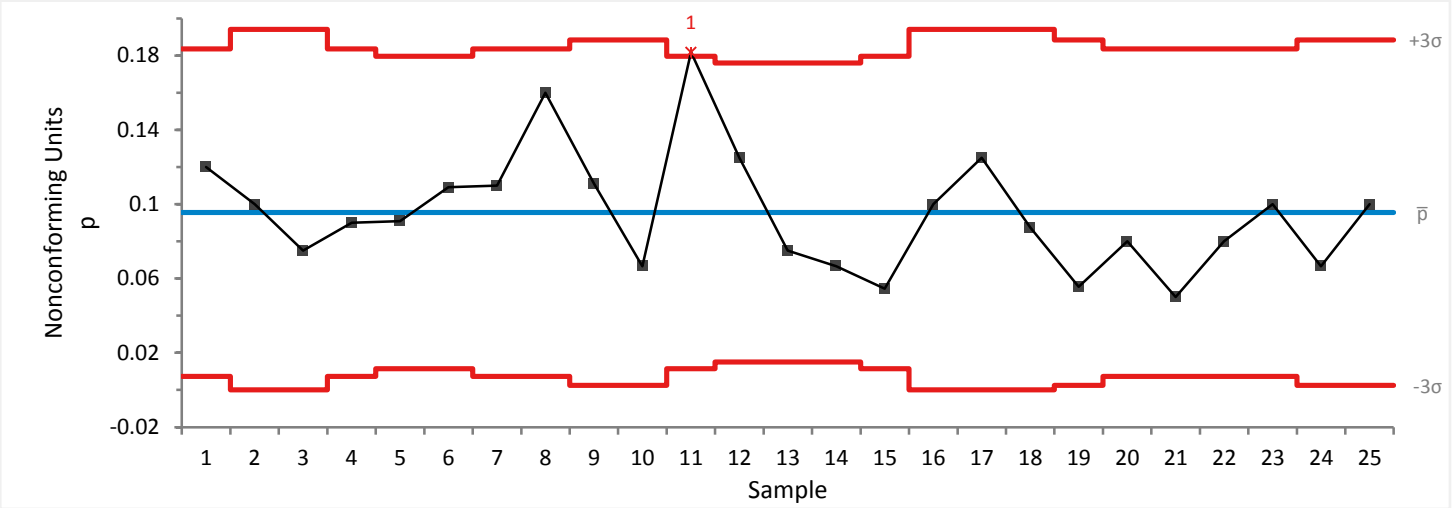
Process Control: Nonconforming Units

Analyse-it v4.60

Purchase order data (from Montgomery page 311)

Last updated 2 February 2016 at 8:11 by Analyse-it Software, Ltd.

Control



Out-of-control signals

Sample	Statistic	Value	Broken rule
11	p	0.182	1

1: 1 point is outside the control limits.

Process parameters

	Proportion
Nonconforming Units	0.0955

Process control statistics

Statistic	Sample size	Centre	±3-sigma limits
p	80	0.0955	0.0000 to 0.1941
p	90	0.0955	0.0026 to 0.1885
p	100	0.0955	0.0073 to 0.1837
p	110	0.0955	0.0114 to 0.1796
p	120	0.0955	0.0150 to 0.1760

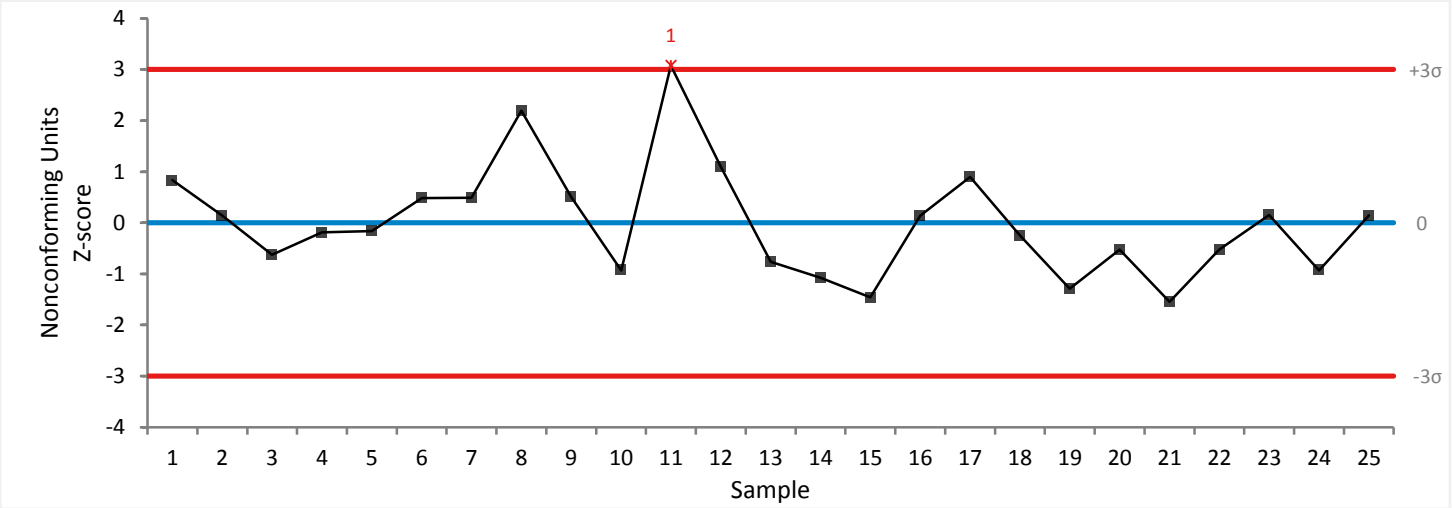
Process Control: Nonconforming Units

Analyse-it v4.60

Purchase order data (from Montgomery page 311)

Last updated 2 February 2016 at 8:11 by Analyse-it Software, Ltd.

Control



Out-of-control signals

Sample	Statistic	Value	Broken rule
11	Z-score	3.080	1

1: 1 point is outside the control limits.

Process parameters

	Proportion
Nonconforming Units	0.0955

Process control statistics

Statistic	Sample size	Centre	±3-sigma limits
Z-score	-	0.0000	-3.0000 to 3.0000