Seven Quality Control Tools

Bawani Ho
Acme
2007-Jan-13 : 12:12:58

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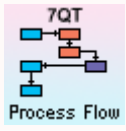
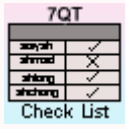
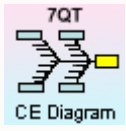
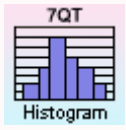
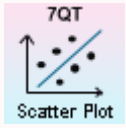
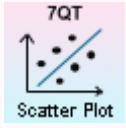
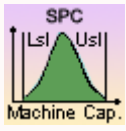
Project Flow

Stages	Objective	Activities	Deliverables	Applet
1	Process Flow Chart	To draw a Process Flow	A chart showing how the process is organised	
2	Check List	To create a Check List for production use	Check items that have been completed	
3	Cause-Effect Diagram	To draw a Cause-Effect diagram (also known as Fishbone diagram)	To show all the Causes that can have an impact on the Effect	
4	Pareto Analysis	To draw a Pareto Analysis	Show all important items according to rank	
5	Histogram	To draw a Histogram (without learning statistics)	Show the distribution of data	
6	Scatter Plot	To draw a Scatter Plot (detailed regression analysis available in another applet)	Show the relationship between X and Y	
				
7	Statistical Process Control	To draw a Statistical Process Control chart	Show the machine capability	

Seven Quality Control Tools

Using a Checklist

Bawani Ho
Acme
2007-Jan-12 : 15:56:42

Applet Introduction

Applet Details	
Applet Title	Checklist
Description	Using a Checklist
Objective	To use a Checklist in production
Abstract	The simple Checklist is even used before a rocket take-off to the moon!!
Team Leader	Bawani Ho
Commencement Date	15-Jul-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	Check-the-list
Team Members	

1	IR0020	Farida Sulaiman
2	IR0021	Eswari Raman

Check List

	Item Details			Maintain details		
	Item No.	**Description**	**Availability**	**Machine**	**Maintained by**	**pass/Fail**
1	12XC-124	Cam splitter	Yes	Molding	James	
2	300DM-845	Cam follower	No	Soldering	Cynthia	
3	1XS-45MC	Speed controller	Yes	Motorcycle	Robert	

Seven Quality Control Tools

Top level process flow To draw a process flow Six

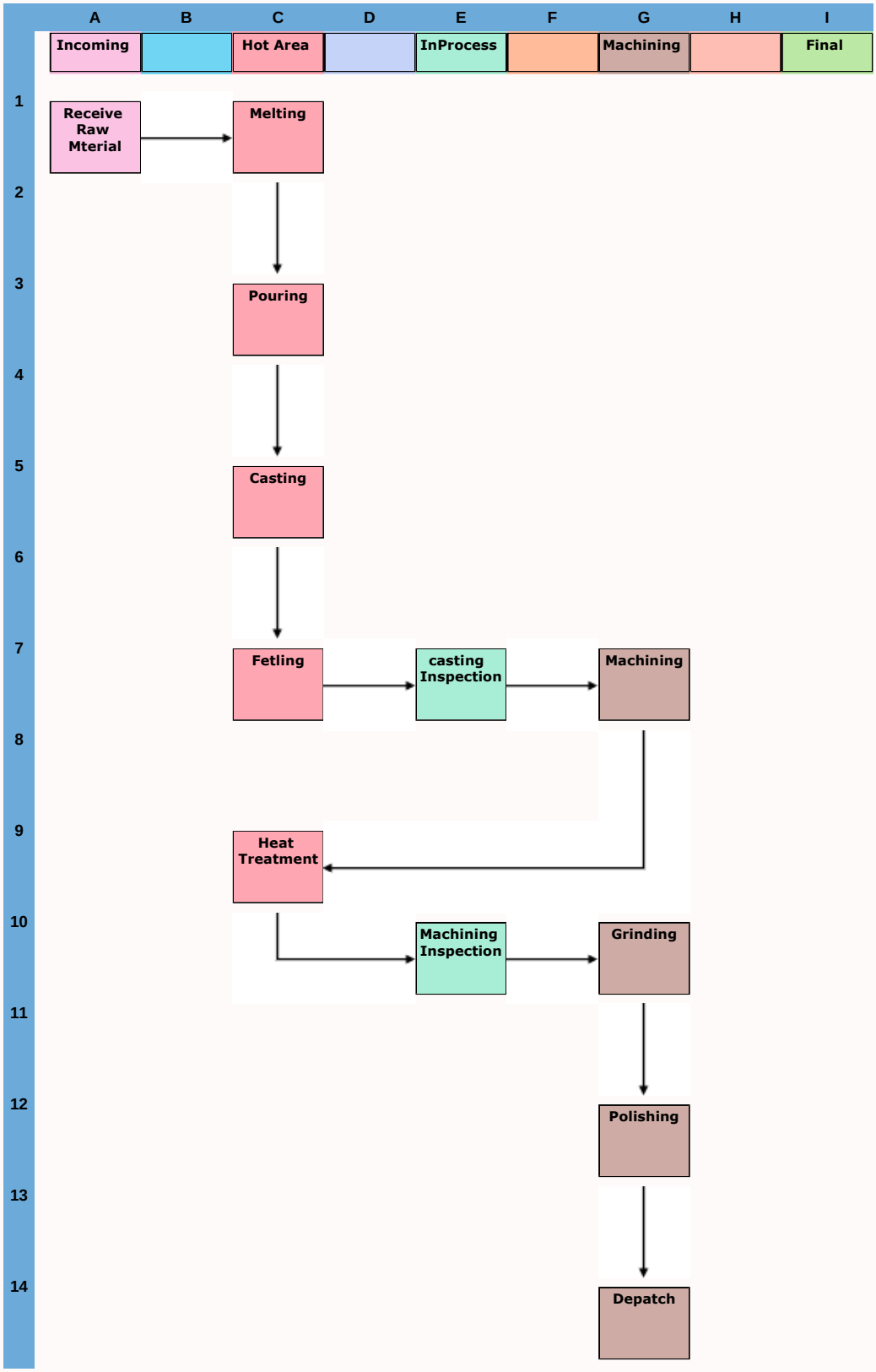
Dr.Nic
Acme
2007-Jan-12 : 11:17:39

Applet Introduction

Applet Details	
Applet Title	Process Flow for Six Sigma
Description	Top level process flow To draw a process flow Six
Objective	To draw a process flow
Abstract	The process flow shows the current processes in use
Team Leader	Dr.Nic
Commencement Date	16-Jul-2006
Expected Completion Date	02-Aug-2006
Completion Date	22-Jul-2006
Status	Not Completed
Team Name	Headlight Team
Team Members	

1	IR0025	Fauzi Rozita
2	IR0018	Dharmarajah Paagal

Process Flow Chart



Seven Quality Control Tools

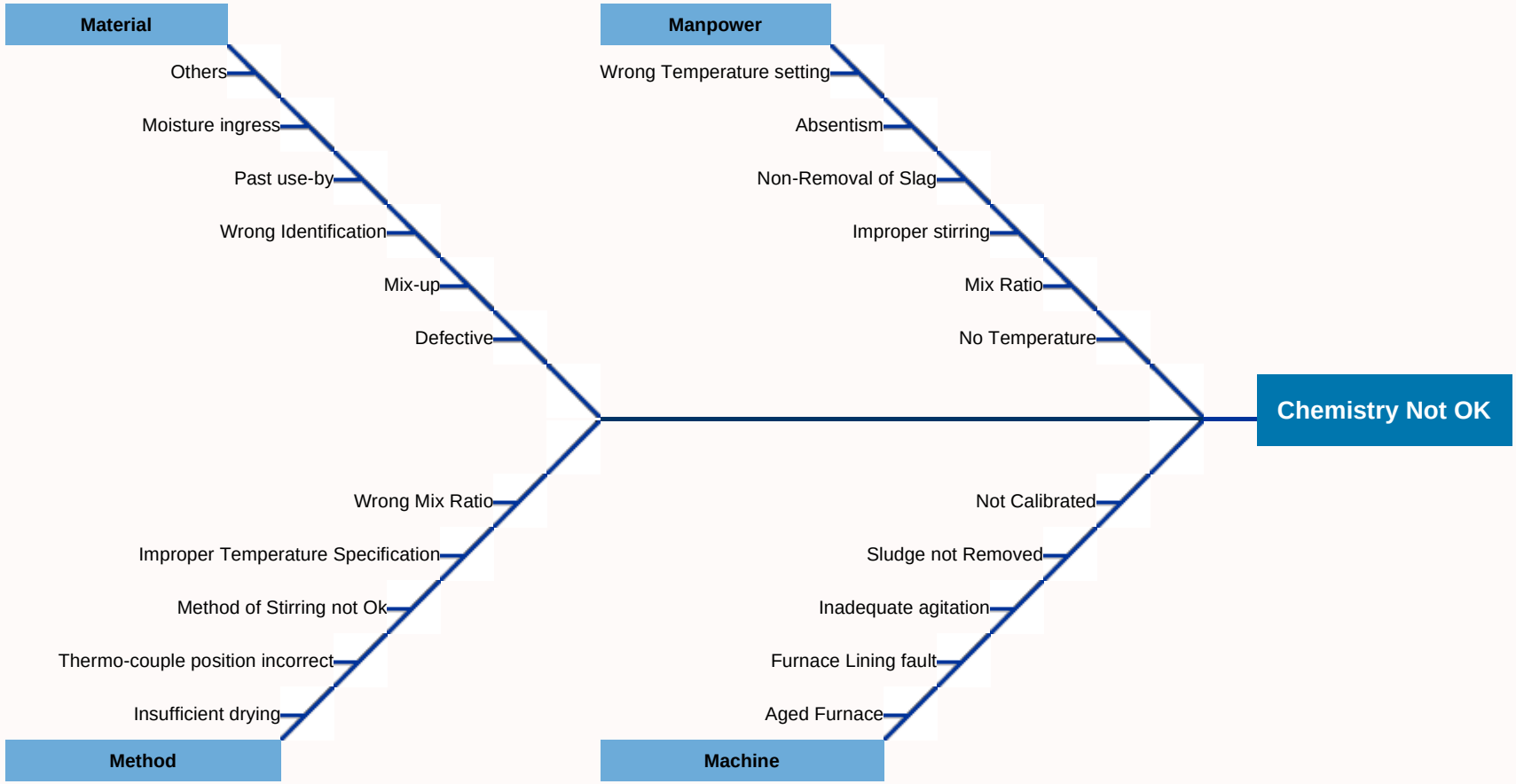
Chemistry Not OK

Dr.Nic
Acme
2007-Jan-12 : 16:04:59

Applet Introduction

Applet Details	
Applet Title	Cause-Effect
Description	Chemistry Not OK
Objective	To identify all causes that result in chemistry not ok for casting defects
Abstract	Chemistry not ok has been a problem in the casting area for over a year. The problem has largely been due to the lack of understanding the root cause. This teamwork enables the the identification of all causes.
Team Leader	Dr.Nic
Commencement Date	16-Jul-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	
Team Members	**1** IR0001 Amina Hameed

Cause-Effect Diagram



Seven Quality Control Tools

To identify the key factors and cost

Dr.Nic
Acme
2007-Jan-12 : 15:59:42

Applet Introduction

Applet Details	
Applet Title	Pareto Analysis
Description	To identify the key factors and cost
Objective	To identify the vital factors or cost in a list of items
Abstract	Managers always ask what the most important defect, cost, etc. is. To answer these questions, we need a Pareto Analysis.
Team Leader	Dr.Nic
Commencement Date	16-Jul-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	Pareto Team
Team Members	

1	IR0001	Amina Hameed
2	IR0004	Azzizi Azizi

Pareto Analysis

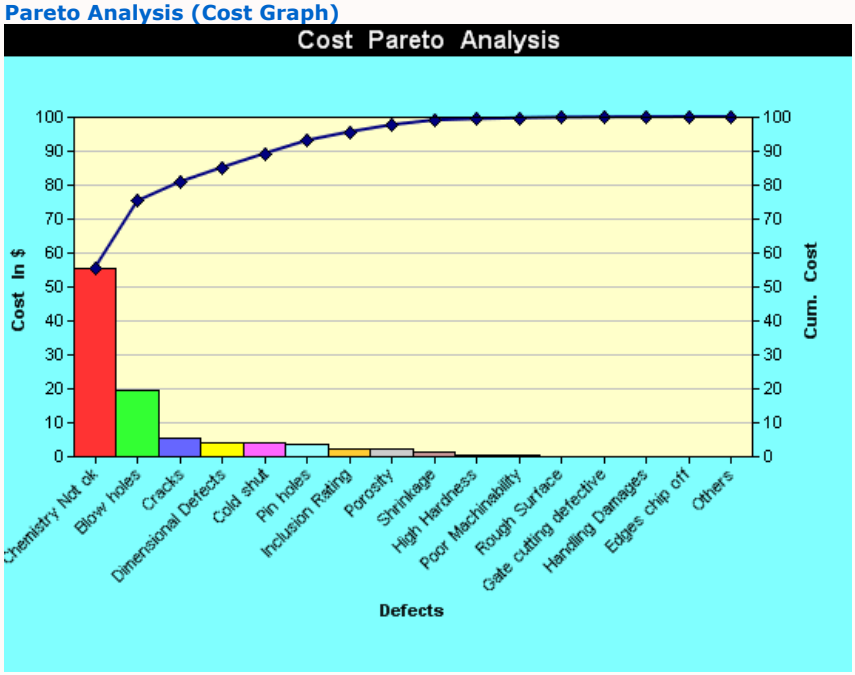
Display By : Cost **No. of Defects : 15**

Pareto Analysis (Cost Data)

No.	Description	Defects	$/Defects
1	Blow holes	265	10.0000
2	Porosity	56	5.0000
3	Chemistry Not ok	576	13.0000
4	Shrinkage	185	1.0000
5	Inclusion Rating	112	3.0000
6	Cold shut	11	50.0000
7	Pin holes	130	4.0000
8	Dimensional Defects	96	6.0000
9	Gate cutting defective	12	1.0000
10	Handling Damages	6	1.0000
11	Rough Surface	8	3.0000
12	Edges chip off	5	1.0000
13	High Hardness	17	3.0000
14	Poor Machinability	5	7.0000
15	Cracks	750	1.0000
		2234	

Description	$/Defects	% $/Defects	Cum. % $/Defects	Comments
Chemistry Not ok	7488.000000	55.598456	55.598456	Vital Few
Blow holes	2650.000000	19.676270	75.274725	Vital Few
Cracks	750.000000	5.568756	80.843481	Vital Few
Dimensional Defects	576.000000	4.276804	85.120285	Vital Few
Cold shut	550.000000	4.083754	89.204039	Vital Few
Pin holes	520.000000	3.861004	93.065043	Vital Few
Inclusion Rating	336.000000	2.494802	95.559846	Vital Few
Porosity	280.000000	2.079002	97.638848	Vital Few
Shrinkage	185.000000	1.373626	99.012474	Vital Few
High Hardness	51.000000	0.378675	99.391149	Vital Few
Poor Machinability	35.000000	0.259875	99.651025	Vital Few
Rough Surface	24.000000	0.178200	99.829225	Vital Few
Gate cutting defective	12.000000	0.089100	99.918325	Vital Few
Handling Damages	6.000000	0.044550	99.962875	Vital Few
Edges chip off	5.000000	0.037125	100.000000	Vital Few
	13468.000000	100.000000		

Pareto Analysis (Cost Graph)



Seven Quality Control Tools

Drawing a Histogram

Bawani Ho
Acme
2007-Jan-12 : 11:43:29

Applet Introduction

Applet Details	
Applet Title	Histogram
Description	Drawing a Histogram
Objective	To draw a histogram using a dataset
Abstract	A Histogram is useful to show the location and spread properties of a dataset
Team Leader	Bawani Ho
Commencement Date	16-Jul-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	Headlight Team
Team Members	

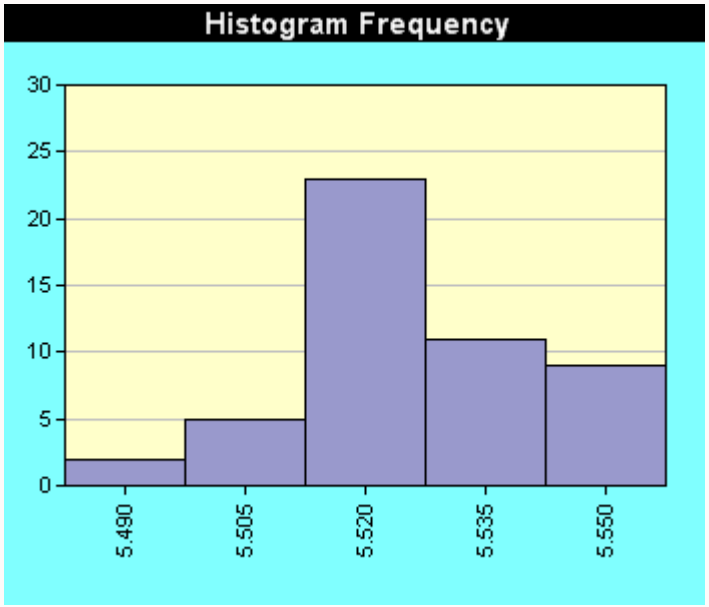
1	IR0015	Cho Boon Siah
2	IR0029	Halim Hamidi
3	IR0030	Hamid Shairy
4	IR0007	Azura Fariq

Histogram

Data	1	2	3	4	5	6	7	8	9	10
1	5.52	5.51	5.52	5.53	5.54	5.50	5.52	5.51	5.51	5.53
2	5.49	5.52	5.55	5.53	5.52	5.51	5.50	5.52	5.50	5.50
3	5.55	5.49	5.55	5.52	5.53	5.53	5.52	5.51	5.53	5.52
4	5.51	5.53	5.52	5.53	5.50	5.52	5.54	5.51	5.52	5.54
5	5.53	5.52	5.54	5.52	5.53	5.55	5.54	5.52	5.51	5.53

Min. Value	5.490
Max. Value	5.550
Mean	5.522
Stdev	0.015
No. of Cells	5
Cell Interval	0.015

Display By : Frequency



Histogram Data

Specification	Freq.	Cum. Freq.	Rel. Freq.	Cum. Rel. Freq.
5.490	2	2	0.040	0.040
5.505	5	7	0.100	0.140
5.520	23	30	0.460	0.600
5.535	11	41	0.220	0.820
5.550	9	50	0.180	1.000

Seven Quality Control Tools

Identifying causal relationships

Bawani Ho
Acme
2007-Jan-12 : 11:49:25

Applet Introduction

Applet Details	
Applet Title	Scatter Plot
Description	Identifying causal relationships
Objective	To enter X and Y data to draw a scatter plot
Abstract	Scatter Plot is usuful to see the relationship between X and Y data
Team Leader	Bawani Ho
Commencement Date	08-Aug-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	Headlight Team
Team Members	

1	IR0006	Azrin Othman
2	IR0041	Hoh Chee Meng

Scatter Graph

Scatter Selection Mode : **Fit**

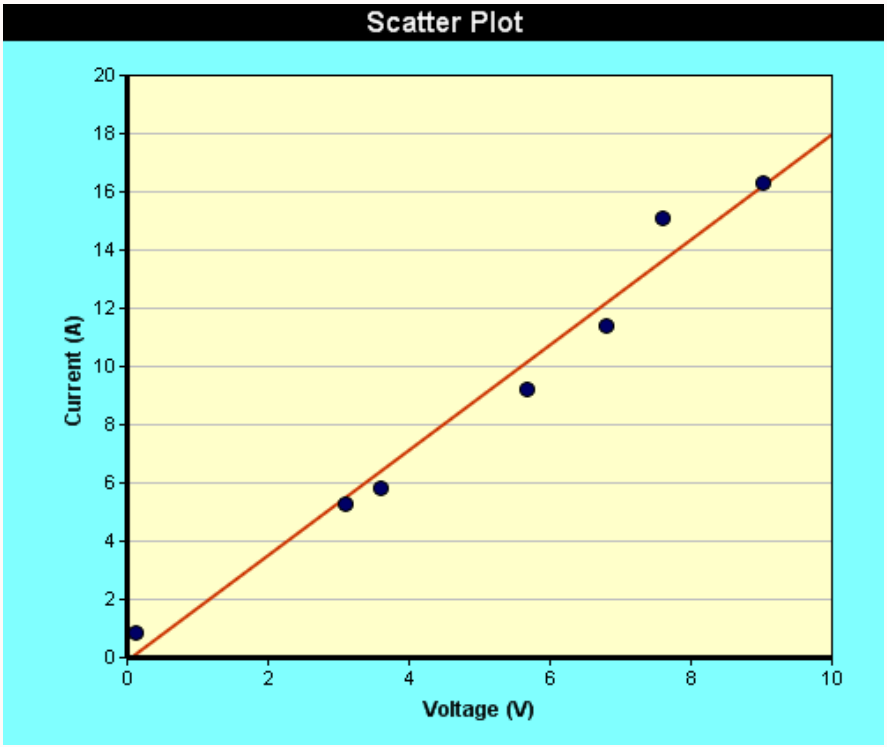
Scatter Graph Data

No.	Voltage (V)(X)	Current (A)(Y)
1	0.12	0.85
2	3.10	5.30
3	3.60	5.80
4	6.80	11.40
5	5.67	9.20
6	7.60	15.10
7	9.03	16.30

Calculations

	XX	YY	XY
	0.014	0.722	0.102
	9.610	28.090	16.430
	12.960	33.640	20.880
	46.240	129.960	77.520
	32.149	84.640	52.164
	57.760	228.010	114.760
	81.541	265.690	147.189
SSQ	240.274	770.752	429.045
Number	7	7	7
Average	5.131	9.136	46.879
SSQ	55.953	186.524	100.890

Correlation (R^2)	0.975
Correlation (R)	0.988
Slope (β)	1.803
Intercept (α)	-0.117



Correlation

To establish if there is a linear association between Voltage (V) and Current (A).
The linear association between Voltage (V) and Current (A) is 0.975.

Regression

The regression equation shows the linear relationship between Voltage (V) and Current (A).
The regression equation between Voltage (V) (X) and Current (A) (Y) is y =1.803x + -0.117.
Slope 1.803
Intercept -0.117

Value of Y for given X

If Voltage (V) = 4.000 Then Current (A) = 7.096

Value of X for given Y

If Current (A) = 0.000 Then Voltage (V) = 0.065

Seven Quality Control Tools

Bawani Ho
Acme
2007-Jan-13 : 12:11:47

Applet Introduction

Applet Details	
Applet Title	Machine Capability
Description	
Objective	
Abstract	
Team Leader	Bawani Ho
Commencement Date	04-Nov-2006
Expected Completion Date	
Completion Date	
Status	Not Completed
Team Name	
Team Members	***No Team Members are selected.***

Machine Capability

Name of Study	Mach Study	**Specification**	3	**Min. Value**	4.200	**USL**	4.000
Type of data collected	Meters	**(+)**	1	**Max. Value**	5.800	**LSL**	2.000
Unit of measurement	MM	**(-)**	1	**Stdev**	0.416	**Tolerance**	2.000

Data	1	2	3	4	5
1	5.50	5.60	5.80	5.50	5.30
2	5.20	5.10	5.60	5.10	4.90
3	5.20	4.30	5.30	5.60	4.20
4	4.90	5.20	5.10	5.60	4.30
5	5.20	4.90	5.30	4.90	5.20

Specification	Freq.	Cum. Freq.	Rel. Freq.	Cum. Rel. Freq.	Sigma
4.200	1	1	0.040	0.040	-1.750
4.600	2	3	0.080	0.120	-1.170
5.000	4	7	0.160	0.280	-0.580
5.400	11	18	0.440	0.720	0.580
5.800	7	25	0.280	1.000	

Graph Interval		Reading			
No. Of Cells	5	**Slope**	1.900	**Int Mean**	5.190
Cell Interval	0.400	**Constant**	-9.830	**Stdev**	0.528
Display By	Frequency	**Int 3s**	6.770		
Spreads		**Machine Capability**			
Spec	2.000	**Cm**	0.632		
Process	3.166	**Machine Capability Index**			
Half Process	1.583	**Cmk**	-0.749