



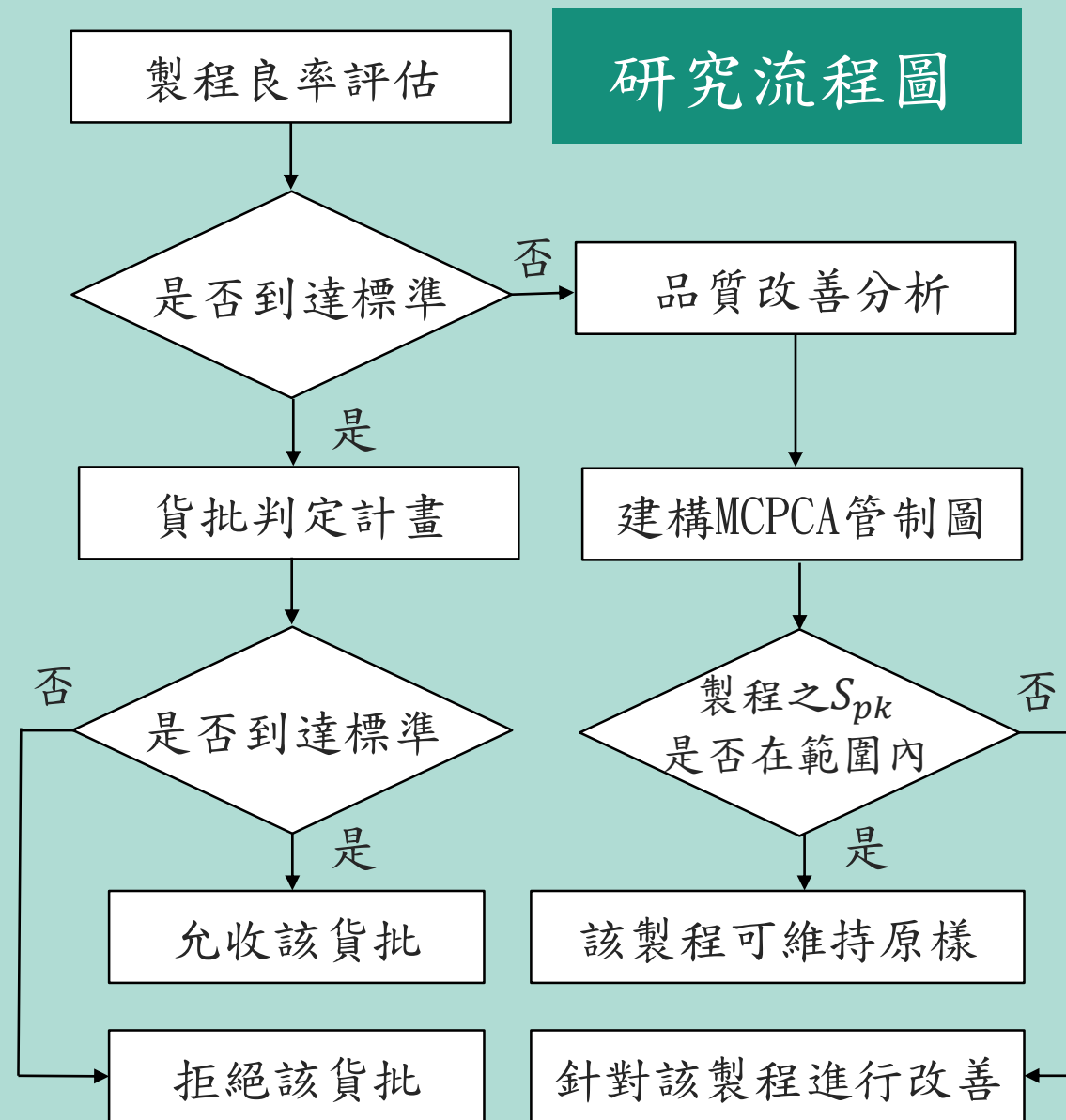
整合製程良率評估、改善分析圖 及貨批判定計畫之研究

組別：第二十組

國立清華大學 工業工程與工程管理學系

研究動機與目的

近年來消費者對於品質的要求愈來愈高，許多學者也不斷投入在設計及建構新型或進階的品質管控衡量方法。其中Boyles (1994)所提出的製程能力指標 S_{pk} 與良率有一對一的關係，可惜由於 S_{pk} 背後的統計理論相對於其他製程能力指標複雜許多，使得其理論方法及研究成果在產業界的應用一直受到限制。因此，此專題計畫主要目的擬以 S_{pk} 為基礎，針對其在製程良率評估、品質改善分析以及貨批檢驗及判定計畫之相關理論方法及模型進行整合，建立一套圖形化的使用者操作介面（Graphical User Interface, GUI）平台。



Process Yield Assessment

1. 設定相關資料

Initial setting

Type of test :

Process yield assessment in terms of :

(NCPM : nonconformities in units of parts per million)

Referenced Data

H₀ (Null Hypothesis) : =

H₁ (Alternative Hypothesis) : =/

Alpha (Level of Significance) :

☐ 0.1 ☒ 0.05 ☐ 0.01 ☐ other :

USL(Upper Specification Limit) :

LSL(Lower Specification Limit) :

Input data

(only for .txt and .xls)

	1
1	81
2	83
3	79
4	80
5	82

Enter the data from up to down and left to right

輸入完畢後點選

3. 顯示計算結果及相關資訊

Result

n : X bar : S (standard deviation) : **Spk hat :**

Cp hat : Ca hat : Cp : measures the overall process variation
Ca : measures the degree of process centering

Analysis

Test Statistic

C.R. (critical rigion) : { $T > Z_{0.05} = 1.95996$ or $T < -Z_{0.05} = -1.95996$ }

T (testing statistic) : **Reject H0**

Confidence Interval of Spk

C.I. (confidence interval) : [,]

Corresponding yield : [,]

Decision

The process satisfied yield requirement.

是否接受虛無假設

製程良率是否達到標準

MCPCA control chart

Multi-Characteristic Process Capability Analysis control chart

Referenced Data

Requirement of overall process capability (Requirement Total Spk) : 1.5

Require Specification Limit

1. 設定相關資料

	LSL(lower specification limit)	T(Target)	USL(Upper specification limit)
A	4	5	6
B	10	11	12
C	20	30	40
D	75	80	85
E			

Enter one characteristic standard in one row

Input data

Import File (xlsx)

2. 輸入或匯入樣本資料

	A	B	C	D	E
1	5.8	11	30	84	
2	5.7	11.2	31	72	
3	5.8	11.1	35	83	
4	5.75	11	32	75	
5	5.8	10.99	30	72	
6	5.77	11.1	35		
7		11	20		
8		11			

Enter one characteristic data in one row

輸入完畢後點選

clear

Analysis

3. 顯示計算結果及相關資訊

Result

Critical Region

Every Spkj should > 1.59543 then the process will be capable.

Data Information

	n	x bar	s	Spk hat	Cdr hat	Cdp hat
A	6	5.7700	0.0400	1.9554	0.7700	0.0400
B	8	11.0488	0.0766	Inf	0.0488	0.0766
C	7	30.4286	5.0615	0.6562	0.0429	0.5062
D	5	77.2000	5.8907	0.2534	-0.5600	1.1781
E						
F						
G						
H						
I						
J						
K						

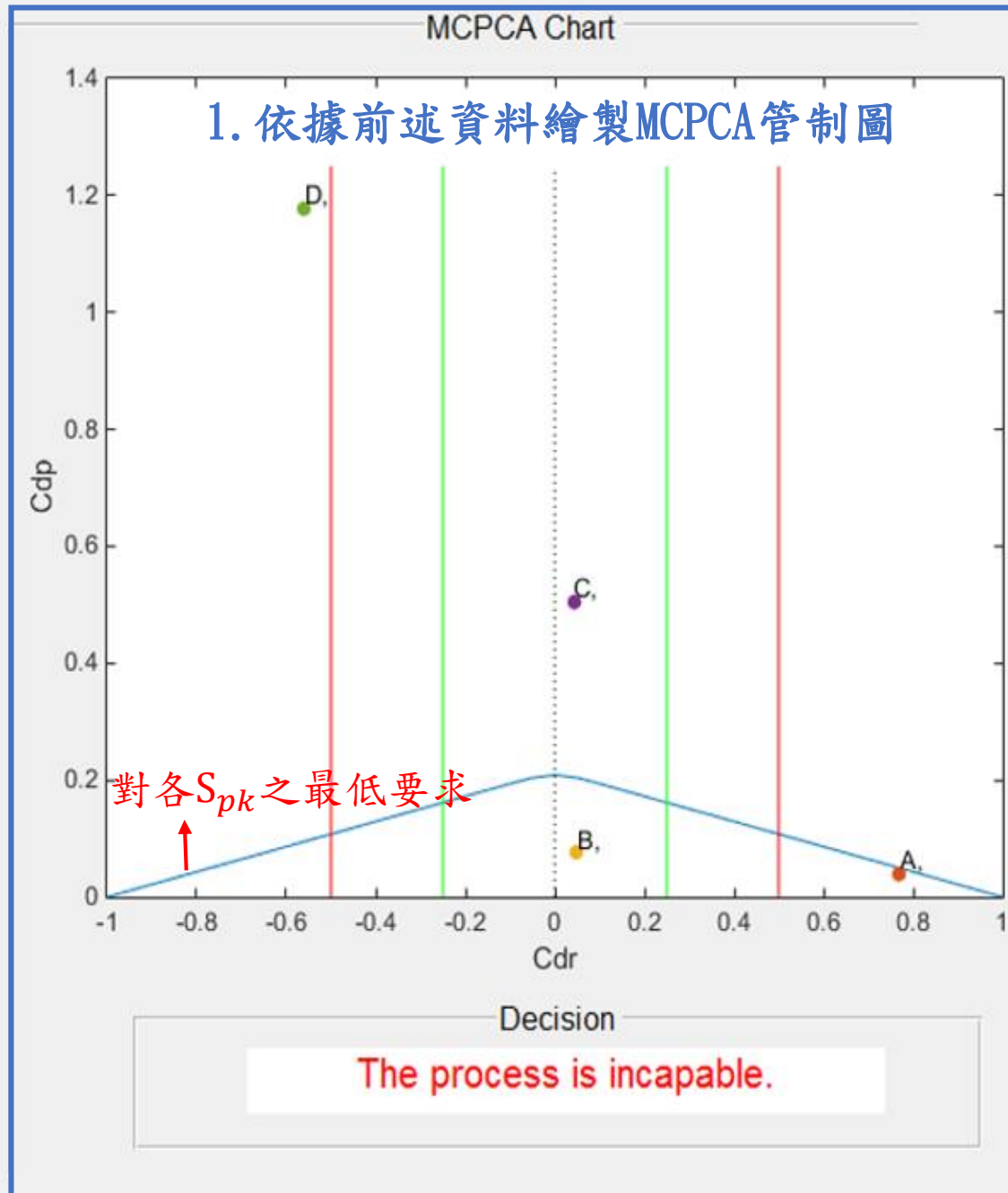
Conclusion

The overall process is incapable.

Incapable process: C, D,

進一步建構MCPCA管制圖

Construct MCPCA Chart



Data Information

	n	Spk	Cdr hat	Cdp hat	Zone	result
A	6	1.9554	0.77	0.04	3	capable
B	8	Inf	0.04875	0.076614	1	capable
C	7	0.65622	0.042857	0.50615	1	incapable
D	5	0.2534	-0.56	1.1781	3	incapable
E						
F						
G						
H						
I						
J						
K						
L						

2. 顯示計算結果及相關資訊

Suggestion

improvement priority :

1. D,
Both the variability and the deviation from the target must be reduced to improve the process quality.
2. C,
The variability be reduced to improve the process quality.
3. A,
The quality improvement effort could be focused on the reduction of the process deviation from its target.
4. B,
A reduced sampling plan could be considered.

若對各名詞解釋有疑問, 可點選此鍵

help

Variables Sampling Plan

Single Sampling Plan

1. 設定相關資料

Initial setting

Process yield assessment in terms of : (NCPPM : Numbers of nonconformities parts per million)

Referenced Data

Acceptable Quality Level (AQL) :

Rejectable Quality Level (RQL) :

Alpha (Level of Significance) : ☐ 0.1 ☒ 0.05 ☐ 0.01 ☐ other :

Beta : ☐ 0.1 ☒ 0.05 ☐ 0.01 ☐ other :

輸入完畢後點選

Required sample size and critical value

Sample size (n) :

Critical acceptance value (C0) :

2. 根據上述資料計算抽取數量及判定準則

3. 輸入產品的規格界線及抽樣資料

Referenced Data

USL(Upper Specification Limit) :

LSL(Lower Specification Limit) :

Input data

Import File

	1
1	81
2	83
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4	80
5	82
6	81

Enter the data from up to down and left to right

輸入完畢後點選

Analysis

Product lot Info.

Xbar (sample mean) : Cda hat :

s(standard deviation) : Cdp hat :

Spk hat :

根據前述資料判斷是否允收該貨批

Result

The entire lot should be rejected.

4. 顯示計算結果及相關資訊