

The reliability of technical and economic analysis

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1 INTRODUCTION

In China, Reliability Engineering, with the development of science and the reform of techniques, has been widely applied in electronic, mechanical, textile and metallurgical fields. Recent years, criteria, such as "The reliability programme of the R and D and the production of system equipment" and "The management principle of reliability and maintenance" have been specified in our country. In our electronic industry department, criteria, such as "The reliability of the engineering management of electronic equipments" and "The control programme of new product reliability and quality" also have been clearly promulgated.

Now, Reliability Engineering has attracted great attention in a great range from technical and economic decision to Feasibility Studies.

(i) When we make a design or update mechanical equipments, we need analyse the project both in technically and in economically to make our analysis successfully.

(ii) When we evaluate a project, we take a lot of time to do Feasibility Studies to get the suitable outcome and to study the project scientifically.

(iii) When we design and analyse a project, we must minimize the evaluation of failure and correct the mistake (unreliability) in time.

(iiii) When we study a project, we must assess how many human, material and financial resources are needed in order to ensure the project's reliability.

This is why we mention the reliability of technical and economic analysis.

2 PROCESS ANALYSIS

It is emphasized that Reliability Engineering is not only needed to specify criteria of the reliability of the project, but is also needed to analyse and inspect the project technically and economically, and that the project is a process analysis and the analysis must be paid attention to during the whole process analysis from the beginning to the end, that is to say that the analysis should be linked with Follow Analysis. The general steps of the process analysis

will be first introduced and then the probabilistic targets is used to evaluate and inspect in Ten-Point law and in Radar method.

3 THE GENERAL STEPS

(i) WHY. Analyse the project technically and economically, write a report, indicating why we analyse the project.

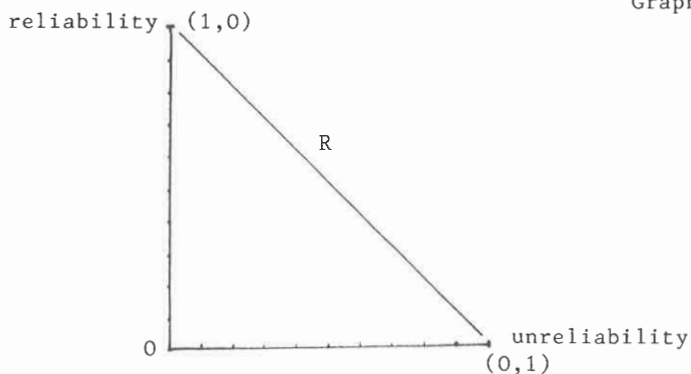
(ii) WHAT. Examine the report through a formal examination, then, submit a feasible solution to the project to find what the reliability is.

(iii) HOW. Carry on Follow Analysis to the project and continue to examine the technical and economic decision to know how the project is going on.

4 TEN-POINT LAW

In China, the man's merit and error is often evaluated by Ten-Point law, for example, "three to seven" or "four to six". It is inspired in this way, the Ten-Point law can also be applied in reliability analysis.

Ten-Point law is shown as graph 1:



(i) From 0 to 1, each point on the Ten-Point line R represents the probability of reliability (unreliability), but the two points (0,1) and (1,0) are not in existence.

(ii) The line R is a continual point line. It takes (0,1) or (1,0) as the interrupted point and expresses them as the limiting points of a sequence.

The Ten-Point law shows that the analysis of the project is a process from unreliability to reliability; we must evaluate and analyse correctly to look for the satisfactory reliability point.

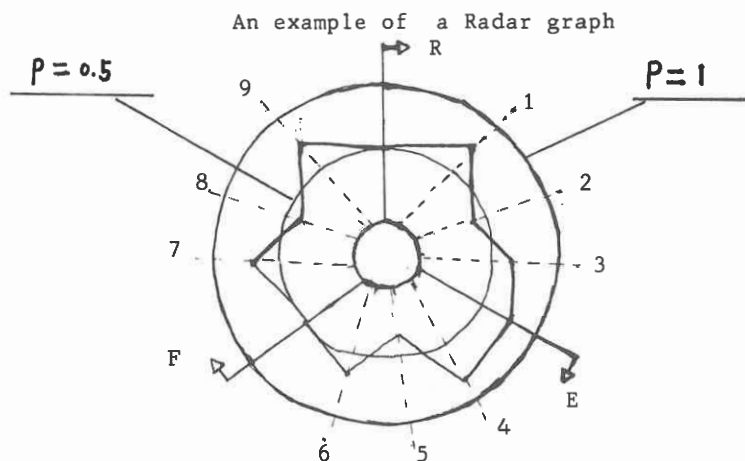
5 RADAR METHOD

A better reliability of technical and economic analysis is achieved by linking Reliability Engineering theory with practice to get the project's reliability.

A feasible reliability of project is an objection of our analysis. An advanced and applicable technique, and an optimum and acceptable economic effect is what we want.

An effective reliability of project is an analysis process and that the project must be examined and inspected in different aspects and

in different way,so, the Follow Analysis is needed.Radar method is a method that takes into account the reliability,feasibility and effectivity of the project,using probabilistic targets to evaluate the project according to the project's case.Usually,the examination process can be programmed.



Radar method is an effective method to the Follow Analysis of the project.Through the Radar,we can know the technical and economic activities in time,examine the reliability of technical and economic analysis,and get the experience of reliability for future technical and economic decisions.

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