

Method of Non-optimum Analysis on Risk Control System

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Abstract—This paper discusses in detail the theory of non-optimum analysis on risk management systems. It points out that the main problem of exploring an indefinite system's optimum lies in the lack of non-optimum analysis on the risk management system. The paper establishes the syndrome and empirical analysis based on the non-optimum category of the risk. At the same time, through the concept of intervenient optimum, it analyzes the actual significance of the optimum of the risk control. Based on non-optimum analysis, it puts out the academic idea of extension risk analysis. At the same time, it also puts forward the non-optimum measurement of the risk system along with non-optimum tracing and self-organization of the risk systems.

Index Terms— Risk system, Non-optimum category, measurement method, non-optimum analysis, self-organization of risk control system

I. INTRODUCTION

Non-optimum analysis on systems is the academic idea proposed by a Chinese scholar in 1985[1]. In the following years, the research of systems' non-optimum has developed very fast, both in theory and in practice, which involves non-optimum recognition of systems, evaluation of the optimum and non-optimum solutions, the non-optimum measurement of systems, the non-optimum differentiation and instruction of systems in the engineering areas. The non-optimum analysis theory of systems, based on the results of the recognition and practice of mankind, establishes the most optimal and non-optimal research fields, in order to satisfy the subjective requirements of people and fulfill the objective regulations. The optimum category consists of the most optimum and optimum, which refers to the processes and results of success. The non-optimum category is composed of the processes and results of failures and acceptable, imperfect situations. Unfeasibility and unreasonableness are typical non-optimum. Although being feasible and reasonable in a certain degree, they still belong to the non-optimum category. In reality, every system belongs to the non-optimum category. It meets the recognition and realization of mankind to analyze the causes of non-optimum system and the ways to reach optimum from the viewpoint of non-optimum category.

This way of thinking is abbreviated as non-optimum tracing theory, and the theory of researching and tracing non-optimum is called non-optimum analysis theory of system. The writer probes into several problems of non-optimum analysis on systems from the viewpoint of engineering [1].

II. CATEGORIES OF NON-OPTIMUM ANALYSIS

A. Actual significances of non-optimum analysis of risk management system

The theory of non-optimum analysis on systems and the tracing of optimum modes are interrelated and inter-perforated, and stand reciprocally contradictory. The former expresses the escape from non-optimum category and the latter displays the exploration of the most optimal mode and its procedure. Based on the interrelationship of the two research areas, the formation of non-optimum category and the constraint of non-optimum are the foundation to establish the optimum category. It means that only when man does the research out of the non-optimum category, can they be on their way to trace the most optimal modes [2].

Risk management and risk analysis, a synthetic product of sophisticated science and technology, came into being in the 1980's. It abstracts a control system into a model and searches for the most optimal solution systematically under restrictions. However due to the complexity of mankind's practice, there are numbers of unknown and uncertain factors, longitudinal and transverse relationship of things, people's behavior. Especially as the system heads to the orderly dynamic condition, some of the hidden troubles are not exposed, the achieved most optimal modes are in unstable states. This implies that the recognition and practice of mankind is featured by the exploration and pursuit not only in an optimal category, but also, under many conditions, in a non-optimum category. That is to say when people are faced with urgent problems, they need not only to find out the most optimal mode or realize the most optimal aim, but also, more importantly, to get rid of the vicious influences of non-optimum accidents effectively as well as control the non-optimum factors of the risk management system.

In the risk analysis, there lie always two schools of thinking differences in nature: one is the regular thinking, which goes along with the existed thinking pattern; the other is the reversed thinking, which goes against the existed thinking pattern. The history of scientific research shows that the regular thinking pattern might easily cause people to be rigid and stubborn, which lead to failures of scientific research; while the reversed thinking can enlighten scientists and lead to success of scientific research. The non-optimum analysis of control systems is created by the reversed way of thinking.

B. The category of non-optimum in the risk analysis

The concept of non-optimum is quite comprehensive. From the viewpoint of risk systems' entity, non-optimum means unfeasible and unreasonable; from the viewpoint of systems' behavior, it means non-ideal and non-good; from the viewpoint of systems' capacity, it means ineffective and abnormal; from the viewpoint of systems' change, it means obstacles, disturbance and influence. There exists a serious of non-optimum problem from the entity of the risk system to the change of the risk system, which causes non-optimum category. As to every kind of control problems of risk system, there is the individual non-optimum category as well as the common non-optimum category. The so-called individual non-optimum category is decided by the characters of the control system, while the common non-optimum category is an objective entity [3]. See figure 1:

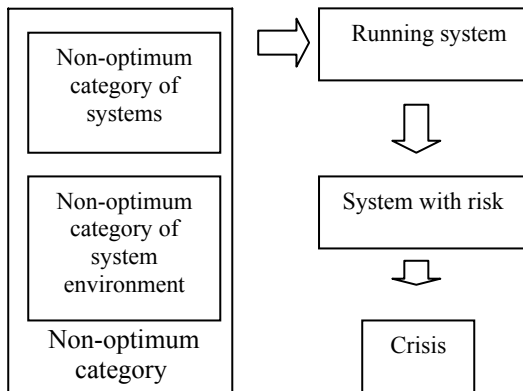


Figure1. From non-optimum to crisis of system

Every risk control systems (RCS) exist in a non-optimum category. Due to the needs of the RCS, certain conducts and functions of the RCS come into being, which are confirmed by the non-optimum category? For example, labor is the inevitable action of the human race. No work, no pay. Man cannot live without food, and the non-optimum of famine and death facilitates the working behavior of human being. Because of the objective non-optimum phenomena, most control systems acquired the corresponding actions and functions.

The real actions of the RCS tell its non-optimum phenomena. Generally speaking, these non-optimum phenomena are included in the non-optimum syndrome, but it is not always the case. If the system has developed a great deal on its former basis or the actual actions of the system differentiate a great deal from the past, most non-

optimum phenomena of the actual system are then not embodied in the non-optimum syndrome and still have things to do with the syndrome.

Since the RCS is rather complex, it takes on certain unclear attributes under any condition. The unclear attributes are unknown things possessed by the system, which are decided by the complexity of the system in numerical value.

The key to analyze and research non-optimum systems lies in how to build up non-optimum syndrome of the RCS. First of all, finding out the non-optimum category of the past is the prerequisite. In the different stages of the past, the size of the non-optimum category might be different, yet non-optimum category is not at all non-optimum syndrome. Therefore, in the non-optimum category, it is important to find out the non-optimum factors that caused the changes of the system's actions, which possess a stable region. Thus, the non-optimum syndromes of the system are composed of these non-optimum factors [4].

There are two factors that need to be paid attention during the formation of the non-optimum syndrome of the RCS: one is non-optimum procedure, and the other is non-optimum result. The decrease of the system's non-optimum level is actually the increase of the system's function, which explains the decrease of the system's uncertain attributes at the same time. Thus the decrease of the system's uncertain attributes reflects the improvement of controllability and observability of the system. From the viewpoint of the system's own characters, the minimization of the non-optimum phenomena is the qualification of creating the maximization of the system's function. From the viewpoint of the system's environment, the decrease of the uncertain attributes decides the direction of the changes of the system's actions. Furthermore, if the system's non-optimum is increasing, the reasons of it lie in two aspects: one is the decrease of the system's function, and the other is the increase of the system's uncertainty, which weaken the observability and controllability of the system. The uncertainty of the change of the system's non-optimum is contrasted with the unstable system. In another word, if the change of the system's non-optimum is determinist, the system is stable.

III. THE EXPERIENCE ANALYSIS OF NON-OPTIMUM SYSTEM

A. System experience and non-optimum syndrome

There are three attributes of the recognition to the non-optimum of the risk system, experience attributes (EA), intuition attributes (IA) and knowledge attributes (KA). The attribute of experience reflects the recognition to the characteristics of the system's behavior. The attribute of intuition reflects the blur recognition to the characteristics of the system's behavior. The attribute of knowledge reflects the definite recognition to the characteristics of the system's behavior. Here the selection of the factors of the non-optimum system is discussed from the experience attribute's viewpoint. See figure 2:

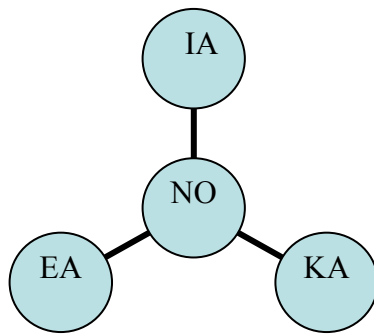


Figure 2. Three non-optimum attribute

B. System experience and non-optimum syndrome

System experience provides non-optimum syndrome for the RCS. When the recognitions are different, the non-optimum syndromes are different as well. The tracing to the system's conditions of the past can propose a non-optimum syndrome. In an artificial system, different people have different behaviors and stories, thus different experiences. Sometimes experiences are called a kind of recognitions; but as the level of recognition is different, the experience of the system is also different. The syndrome of the system is selected and decided by the experience of the system, and the reasonability of the experience's selection is also a meaningful question for discussion. For example, the increase of the function of the system can reduce the non-optimum category, and the changes of the system's behavior can cause new non-optimum factors, which change with the system's behavior. Thus the non-optimum category of the actual system is composed of non-optimum syndrome, the amount of non-optimum changes and the potential non-optimum factors. See figure 3:

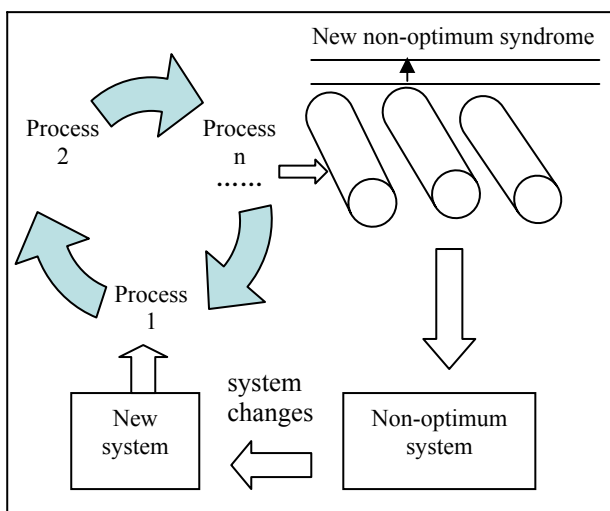


Figure 3. Non-optimum syndrome based on experience

Under the prerequisites of the formation of the system's experience, there is a process of recognition to

the non-optimum system, which is a self-organized and self-accustomed process. Natural non-optimum is an objective entity, which does not change with people's will. However, when people get hold of the basic characteristics of the non-optimum, they can set up certain functions to avoid the non-optimum, which is not the main subject of the non-optimum analysis theory of the system. From the creation to the death of the system, there is an overall running procedure. In fact, a whole, standard running condition does not exist, and also breaches the development regulation of things. From the viewpoint of the dialectic from recognition to entity, this also accords with the entity and recognition to the non-optimum. For example, as a decision-maker of a concern, one first needs to do a series of work related to the management objectives of the concern and the strategic development objectives. That is to say, to find out what methods to take, what problems to solve and what difficulties to conquer. The key to finish this series of work is to correctly find out the non-optimum problem that exists meanwhile with the objectives. Of course, these non-optimum problems are formed by direct experience, indirect experience and partial hypotheses. Mentioning hypotheses, people might ask: Can hypotheses be hypotheses? Can they be replaced? These doubts are unnecessary. The actual research shows that if there is no hypothesis, there is no affirmation; to accept a hypothesis is to confirm; the acceptable effect is in the direct ratio of the affirmation. Most of the chemical systems are set up on hypotheses, which importance is obvious. Mathematics is also the conclusions made by logistic reasoning inference discursiveness discussions based on hypotheses. There are all kinds of hypotheses in economic systems as well, but the hypotheses of economics are not repeatable. When the systems are different, the hypotheses are different. Also the hypotheses of time t_j is not valid in the time period of t_i . For example, an investor decided his goal and hypotheses in the market of t_i , When t_i changes to t_j , the original goals and hypotheses may not hold. Thus, the dynamic characteristics of the goals and hypotheses cause the fact that he cannot make definite answers to this investment under any conditions. The major reasons are brought out by the non-optimum problem [5].

C. The attributes of the system experience and the non-optimum analysis

To understand the entity and the accountability of the hypotheses is a tracing to non-optimum problems of RCS, where experiences are most important. The experience system works with the experience environment, which is the base of the entity and development of the experience system, which in turn works on and influences the environment.

The tracing to the phenomena of the non-optimum of RCS has its own nature and regulation, which has a close relationship with the nature and regulation of the system's experience. Experience is people's conclusion, improvement and accumulation through the recognition, enhancement and control of systems. Experiences develop with human being's entity and development, and

the optimization of experience is one of the most important elements in the development of the society in the history. When experiences possess certain scientific value and form a certain system, they turn into knowledge. Thus, there is a process when experiences transform into knowledge.

From the viewpoint of the system's development, the experience of the recognition of non-optimum risk system is a changing process that develops and changes forever. Through endless feedbacks, the experiences take up changes of quantity, nature and degree, developing from simple to complicated, from material to abstract, from special to general and from undependable to generally dependable. "Failure is the cause of success". This proverb includes two contents for system analysis: non-optimum sets up the basis of the optimization of the system; non-optimum experience is the key concept of the system decision. Of course, the past, present and future of non-optimum is within a time framework, while the quantity and quality of the experience can reflect the contribution of the tracing to non-optimum system to re-recognize the system.

Experience is function of time, which are the primitive non-optimum experiences effecting on the source information of the non-optimum experience. It originates from direct recognition of sensibility. People's intellectual actions interact on each other, which brings about an experience series (to non-optimum problem) as time goes by and recognition goes more and more deeply. Thus the recognitions on non-optimum become general experiences, which in turn become common experiences and continually approach effective experiences. However, it will never reach the ideal experiences.

In the experience system, organizers and decision-makers ought to have a non-optimum information database, which can offer two things to the decision makers: non-optimum syndrome and a system of criteria. In the above analysis, non-optimum syndrome depends on experiences, which has a feasible area. The so-called feasible area of the experiences is an area composed of the maximum of the effective experience of every stage. (Sometimes the effective experience can be drawn from utilization rate of the experience.)

IV. TRACING FROM NON-OPTIMUM TO THE SELFORGANIZATION OF SYSTEM

In the research of the self-organization theory of the system, the theory of dissipation structure, the theory of hyper circulation, synergetic theory and chaos theory contribute a great deal to it. In fact, their individual theory includes non-optimum theory of the system. Because the major characteristic of the self-organization of the system is to perfect the running of the system and develop its goals, they have to experience from non-optimum to optimum, and from optimum to non-optimum. If the system is not featured with this attribute, it doesn't need self-organization either. Analysis shows that systems always stay on the border of optimum and non-optimum, and the aim of self-organization is to bring the system from the border to the optimal category. There

is a time limitation on the system's stay in the optimal category. Within a certain time, because the system is stable, it stays in the optimal category. However, if the system is not stable, it will soon move from the optimal category to the new border and cause a sustained situation of the system. The sustained situation is neither a developing situation, nor an ideal situation. Of course, the actual angle of the system doesn't have the most optimal criteria, and it is also not necessary to make sure what is the most optimal. As long as the system can shorten the time of moving from the non-optimum category to the border and from the border to the optimum category, the system is satisfactory. If the system is able to realize the transit, it has a good self-organizing capacity. As is known from the self-organization theory, profound changes will not influence the system, and only the huge changes composed of profound changes might cause the evolution of the system. This conclusion can make the non-optimum control of the system effective, and the system will stay naturally in the optimum category, or on the border. People can achieve the self-organization function on the border, e.g. that the organization is open, exchanges energies with the outside. Thus the function and behavior of the system change and new non-optimum control comes into being. Then, the system goes back to the optimal category. The self-organization through coordination or super-circulation can let the system replicate, consummate itself and reach the optimum category. (It still needs to be emphasized that the optimum category shows the category that can be controlled by the system's non-optimum)[6].

The border mentioned here is an easily comprehended concept. For instance, if one's daily life is in the border situation, it means that the life of this person is sometimes good, sometimes bad. Therefore, it is not sure whether this person's life is the most optimal or non-optimal. When he get accustomed to the environment and can control all of the non-optimum, it is sure that he has improved his living capacity and entered the optimal category. If his life or his environment changes, he needs to change his minds accordingly. Thus new non-optimum problems occur, and the existed controlling ability abates and he returns to the border situation. Now he needs to improve his controlling ability through self-acustoming and self-adjusting, which leads his life to the optimum category. This is a gradually developed and improved process and the mankind's society has grown up through such a process.

The most obvious regulations lie in the economic system. The development degree of a country is shown not only by the change of its economic index.

Because the natures of the systems are different, their border is accordingly different. Of course, the border can change. From the viewpoint of the system's transit regulation, the border is decided by the structure of the system. For example, the border of the optimum and non-optimum of the population system is decided by the synthetically system of the society and the economy. When the population increases to a certain extent, the national economy might keep a certain sustained

development, or fluctuate to a certain level. When the population is under control, the national economy might leave the border situation for entering an optimal category. The economic system in the optimal category is called being in an interim.

This border is different from the border mentioned before, which reflects that the non-optimum attribute is different from the optimal level. Therefore, the border of the economic system and the transit time of the optimum are called the development time of the economic system. However, the aggregate non-optimum of the system will be in chaos, and then new attributes come into being, and part of the non-optimum of the system will accelerate its self-organization. Therefore, the non-optimum behavior and situation of the system contain versatile original dynamic energies, which are excavated, transferred, store and processed systematically in order to build up the non-optimum information system. Actually analysis shows that the advanced format of non-optimum information system can be actualized by the hardware and software of the computer; the primary format can be composed of data, documents and diagrams. The primitive energy of the non-optimum information stored in the systematic database has broken through the limitation of the transit from physical sources to dynamic forces. As long as the states and behaviors of the non-optimum information exist, this energy always contains valid combustion value, and can form the dynamic forces accordingly at any time. The dynamic model of the system is built up as follows:

$$\frac{dx_i}{dt} = \frac{A_i Q_i - D_i}{N} x_i + \sum W_{ik} X_k + \phi_i,$$

where X_i is the i^{th} state value of the system after the non-optimum control, A_i expresses the original state value of the system, Q_i acts as the contribution rate of A_i , D_i acts as the reduced contribution value caused by the non-optimum, N is the state value of the system, and X_k acts as the newly added state value of the system, W_{ik} is the influence degree of X_k on X_i and the last one ϕ_i is the mutation rate of the unclear meta of the system. Any system possesses certain dynamic model, and through this model, non-optimum analysis model can be set up. Moreover, through the self-organization function of the system, the non-optimum analysis function can be perfected. Meanwhile, the non-optimum analysis can improve the system's self-organization [7, 8, 9, and 10].

From the non-optimum analysis theory of systems, it can be concluded that people need the controllable order of the system, and non-optimum can also be more orderly. From the non-optimum reference system, the transit of the system from non-order into order as well as the requisites of the transit can be estimated. The non-optimum theory of systems will be widely used in the decision sciences. It can often transform people's experiences into scientific means and might set up reference models with behavior attributes in the RCS. This kind of model can marry the experiences and the

theories, and can make actual judges to the running path of the system.

V. THE SOCIAL RISK CONTROL BASED ON NON-OPTIMUM ANALYSIS

A. From having and develop to the risk to control

The evolution of the social risk problems follows the sequence of quantitative change to qualitative change to qualitative change to qualitative change, etc. The evolution has a waving type of pattern. The mutation theory points out that the conversion of one state to another can be completed in two ways, mutation and gradation. These different ways of evolution generate different impacts on the social stability.

The evolution of the social risk problems is partly dependent on the changes of the social environment, and partly dependent on the control means and conditions of the government. According to the analysis of the mutation model, it is clear that the risk state model for studying the evolution pattern can be established by finding out the state variables representing the quantitative change, and the condition variables (i.e. controlling variables) which cause the change of the state of the risk-affected state in the social development.

For the analysis of the local risk problem, the same principles apply. There are a number of factors, which affect the risk variations. The difficulty is to find out the dominant variables. All the risk variables can be divided into two groups: direct variables (directly affect the occurrence of a risk). Once the relationship between the direct variables and the state variables is known, the mathematics model can be obtained, and the quantitative analysis can be carried out for the rules of the changes of the risk state.

As to the thing that a complicated risk controls the course, the possibility space of risk not merely has a lot of states, and these states have complicated expansion ways, the condition of influencing the risk form is intricate. So, it is complicated that the corresponding choice controls the course. This require us at the time of controlling the social risk, should pay attention to different stages for development of risk control different thermoses and factors already, And also the relevant function of cooperation that pay attention to between the condition and factor and many kinds of state of development. For example urban environment, space, social economy and risk forming of terms determine risk that takes control the form directly.

But come and say, come and analyze whole social risk issue and carry on with information and view of control ration describe based on this systematically on the whole, Have not mentioned yet that the agenda in this historical stage comes up. Nowadays the human society has already stepped into the era of the information-intensive society, the information superhighway has already involved each field. Say briefly, the information-intensive society depends on various kinds of social activities greatly the information exchange; information processing and information are stored for the characteristic. The

composition of the social risk system is complicated, attribute is various, and dependence is extremely strong. In this case must come and treat with information and height of control risk control problem unifying.

B. From basic attribute of the risk system to controlling

Indicate through analyzing, the non-equilibrium mechanism that controls of the social risk is: Using the views of the information and control, in the possibility space of risk, the ones that realized to various kinds of uncertain risk offences and states were discerned, Chooses and appraises and achieve the purpose that the risk control through the information. To risk characteristic of system, with what kind of angle analyze to risk state and behavior of system, The key question is that target and state to the system classify and appraise. For example, what key element is seven of the risk cases to form the state of the risk case system: What, after a risk case happens, should confirm the type of the risk case, Have established the type of every risk case in the risk system; When, risk time refers to the development order and continuity of criminal offence, Namely the course of the risk; Where, where point risk space, implement the scene of the risk; What thing, what thing means what kind of guilty tool risk people use; What feeling, what feeling means under which kind of state the risk is carried on, including the course of the risk, characteristic and way of the activity; Why, why answer and make why risk, namely motive, purpose problem of risk it will be sinner; Who, still include the characteristics, such as the criminal's sex, age, appearance, habits and customs, physiological characteristic, etc..

The social risks can be treated as a complicated system. There are rules to follow as the system changes and develops. The risk control will be effective once these rules are known. The rules of the social risks play a dominate role in the existence and development of the risks. These rules are a type of relationship correlating to the occurrence of the risk in a society. Inevitability and contingency determine the development of all systems. The two factors coexist in the social risks, including the causality relationship in the occurrence of a risk. Inevitable risks are a phenomenon resulted from the non-coordination and inadaptability factors in the field of economy, policy, management and education. This type of risks dominates the social risk system. Contingent risks are caused by some specific reasons. These risks may or not occur, may occur in this way or the other way. In short, the inevitable risks can be realized through a large number of the contingent risks reflect the inevitable relationship in the social risks. In the modern societies, the rules in the criminal activities can be found out by studying a large number of the random and contingent cases. The role of risk statistics is to describe the properties of the social risks in macroscopic scale based on the statistical analysis of the risks on a microscopic scale [11, 12, 13, and 14].

However, the role of the risk statistics should not be exaggerated. It has to be pointed out that the objectives processed by the statistics should be independent

incidences and large numbers and have a random feature. Strictly speaking, the individual cases in a macroscopic risk study do not fully fulfill the above-mentioned assumptions.

C. Control method and take precautions against decision

Risk is an extremely complicated social phenomenon, and has the features of random mutation according to its occurrence, development and the trend of its evolution. From the viewpoint of government management, society security and risk prevention is the aim of risk control. According to the existing concept on risk control, the control process is determined by three factors:

- Determine the possible space of a social risk;
- Select some states from the possible space as targets;
- Create the necessary conditions to make the risk control reach the preset aim.

Risk control has the nature of socialites and is a kind of government administrations. Its execution is dependent on the coordination from different departments and divisions. Based on system analysis, and in combination with the principle of Synergetic, the main frame for the cooperated control on the social risks is formed. The following factors should be taken into consideration.

(1) Non-optimum factors

It is known that a society is a non-optimum system. According to optimization theory of system, an optimum system hardly has any advance to make.

In an social security management system, exchanges of substance, energy, and information between system and environment are constantly occurring. Hence, the system will deviate from optimum. Each of the functional divisions in the system is not equally distributed, but showing a non-optimum and a non-linear type of interaction. This type of behavior is called non-optimum behavior.

Non-optimum security management system can gain information from outside, and lowering the confusing states within the system. Thus, opening and non-optimum are the two prerequisites for the development of a system. Since the relationship between the social protection systems has a non-linear character, the cooperation function can be generated, and an ordered, function-enlarged self-organized structure can be formed in the system.

(2) The factors involved in non-optimum information

Gaining the non-optimum information (NOI) and processing it are the preconditions for risk control. The key point for a security protection system is the establishment of a non-optimum recognition information system (NORIS). The decision-makers task is to receive all the sufficient and necessary NOI on the risks, make a proper judgment and issue the necessary risk control information.

The effective risk control is dependent on the reliable NOI on risk. The NOI provide the platform for the prediction of the future trends in the social risks. The blindness in security protection can be overcome if the NOI can be gained in time, and used defectively for both original NOI and the high-quality derived information of

non-optimum control. The determination of the reliability of the information of non-optimum control also is an important factor.

The decision-making on security protection needs a feed-back adjustment. It has to be predetermined of the "post-effect" of the decision. One of the effects is delaying, and the other is enlarging. Delaying in making the decision will make the measures of risk control failed. To prevent its occurrence, the importance of the management on the risk information has to be stressed. The effects of enlarging result from the cooperation between different quarters of the society. In this case, an ordered structure is formed, leading to the enlargement of the functions of the risk control system.

(3) The points and factors on driving force

The risk control and security protection are kinetic in nature. It is important to know the kinetic characters in the social risks. Through kinetic analysis, the future trends on risk can be predicted, and the control regulation can be optimized. The number of the random risk cases will be under control with the study on the wave rule. The motion of the risk system can be regarded as a risk space from the Cybernetics point of view. Accordingly, studying all the factors involved in the risk space, e.g., timing of the cases, short-term waves and long-term waves in the local risks will enhance the efficiency of risk control [15-24].

VI. CONCLUSION

So we say that the non-optimum thinking and the methods of system non-optimum with failure-avoiding as its basic aim are based on the no-optimum facts with its special ways of thinking, information gathering, analyzing and processing, and with the setting up of non-optimum system, these methods seek to eliminate mistakes and setbacks, thus providing a new way of scientifically summarizing past lessons and making them lamppost for the future.

In fact the practices of socialist construction since the founding of the PRC have provided the environment for the application of non-optimum thinking system, the methods of system non-optimum analysis, that is, the base informational basis is formed in non-optimum section.

There is profound potential for putting the non-optimum thinking into use in China's economic reform, and in other country's practice. Take the guiding system of non-optimum analysis for example, it can be employed in the reform of the country's macro policies, fiscal and financial mechanism, mechanical and electric industries, development planning, and in the management of joint ventures of domestic and foreign capital, technical and equipment imports and individual firm's operation. To be sure, the establishment of this non-optimum analysis guiding system with computers as its means with information processing techniques as its foundation is no easy task. It entails large-scale information collection, system analysis, and system engineering

We expect that the non-optimum thinking system and the methods of system non-optimum analysis will grow

into a new theoretical branch of system science. Because the non-optimum analysis science, following the system's four principles of entirety, orderliness, interdependencies and dynamism, answers the question of under what conditions and influences a system becomes unstable and how to shorten the system's process from instability to its goal or target cycle, and how to effectively predict and control these instabilities.

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