Abstract—the hidden danger is the basic reason which let accidents occur. In coal mine’s safety anticipating control management; it takes hidden danger information’s recognition, transmission, analysis and control as its foundation. Taking the systems science as the basement and using chaos system principles to analyzing hidden danger information’s control system, it establishes standardized anticipating control system of coal mine hidden danger’s information, realizing hidden danger information’s standardized gathering. Simultaneously, the hidden danger information’s standardization can enhance identification and gathering speed of the hidden danger information. Safety managers will do hidden danger information’s real-time clearance and supervisory control in production process, guaranteeing coal mining system’s initial condition stabilization, preventing long-range correlation’s appearance in the late.

Keywords-hidden danger information; chaos system principles; standardized anticipating control system

The security management is the important component to the coal enterprise management and it is also the significant safeguard of the coal mine safety. With the development of the coal mine security management work, the model of the colliery safety management has developed after-control and in-control to prior control. Therefore, the checking hidden danger system of the coal mining becomes more and more important in accident control’s function. In order to make the coal mine production system safe, the key is to recognize the hidden danger which exists in the system, take the effective action to control and eliminate the hidden danger diligently, guarantee the system’s initial condition’s stability, prevent to appear “gradually magnification effect”, and minimize the risks of the accident occurrence.

1. Hidden Danger Information’s Treating

In hidden danger information’s treating progress, it mainly has the following problem:

- The compositor of the target system does not highlight the important points. In order to make the supervisory personnel to carry on the evaluation to each work step’s target easily based on the work order, the target’s running sequence of the existing evaluation form is arranged on the work order. It does not highlight the great hidden danger resource which exists in each work showing that we should stop working. It is possible that, during the process of treating the hidden danger, we treat this kind of danger as normal hidden danger or have the fluke mind and treat this kind of hidden danger with indifference. At the same time, this type of running order has also brought trouble for later hidden danger processing. When the form has been reported to leaders, the information which they obtain is just that the work has been stopped for great hidden danger, but they do not know which hidden danger has appeared. It hinders the later decision-making.

- (2) The target weight’s design in target appraisal system is unreasonable. Some targets and weight are formulated by the mining bureau. However, under the coal mine’s complex operating environment, each kind of operating environment is infinitely varied. All these conditions may let the pertinence difference and the weight unreasonable. Simultaneously, in order to control the hidden danger, the coal mine enterprises have adopted mercerization management. Some target weight’s unreasonable design may bring the unreasonable penalty, cause the job holder’s disaffection and bring other hidden dangers.

- (3) The feedback mechanism is unreasonable. The present hidden danger’s processing has already adopted management information system, and carried on the simple analysis and processing to the hidden danger. However, this often concentrates to the statistics, which include the hidden danger, the descent frequency and each person’s hidden danger’s statistical analysis. For example, if we carry on the statistical analysis of the hidden danger’s occurrence, we can discover the hidden danger which occurs frequently and carry on the key processing, strengthening the education.

- (4) Lacking regular systematic special diagnosis. The present coal mine management often emphasizes the hidden danger’s investigation. The significant content which it neglects is the regular work diagnosis. This kind of diagnosis can control the system’s initial condition effectively. It is the effective measure to prevent the major accident.
II. CHARACTERISTICS OF HIDDEN DANGER CONTROL SYSTEM

What kind of safety management pattern a enterprise adopts and which mechanism a enterprise follows to process accidents and hidden dangers influence the enterprise’s ability of anti-dangerous disaster and the level of safety management directly. Scientific and reasonable pattern of safety management is the important guarantee system of the enterprise to prevent and control accidents and guard against the happen of hidden dangers. Regarding the coal enterprise, the safety control is its positive cycle safeguard, must consummate unceasingly even changes original traditional the management pattern, replaces by the new modern system safety management pattern. Safety management is the safeguard of virtuous cycle for the enterprise, must be perfected, even changing the traditional management pattern into new and modern pattern of safety management system.

When a system is operating, its behavior and the moving track are decided by two factors: one is the system’s operating evolution law. We can call it the system’s operating law in the system’s development; another is the system’s present condition, and we can call it the system’s initial leading factor in the system’s development. The management systems which we usually say are all chaos system. The moving orbit of the system which is in the chaotic state will sensitively rely on the initial condition. The disparity of two orbits which embark from two neighbor’s starting values is not big, but the two orbits will inevitably have remarkable disparity after enough long time. This is the initial condition’s sensitive dependence of the system’s long-term behavior. The system’s another character is the system’s “magnification effect”. The reason why the system can enlarge the initial reason is that the complex material has the complex structure. Thus, the information of some subsystems which affect in the complex material will expend and disperse along the interior interaction network of the complex material after a period of time. The third significant characteristic of the system is long-range correlation—long-term behavior’s unpredictability. The chaotic motion will have the characteristic of long-range correlation after it having the characteristics of the initial condition’s sensitive dependence and magnification effect. This kind of long-range correlation’s characteristic may cause the system’s interior to have some changes. For example, the two initial conditions may be irrelevant mutually when they do have any intersection. Once they have the interaction, they may have the enormous influence, and even destroy the system’s balance.

The theory of system safety believes that the dangerous resources (hidden dangers) are the essential reason leading to accidents. In order to control hidden dangers, guarantee the stability of initial condition, prevent scale effect and long distance connection of later stage, the enterprise must adopt modern system safety management.

III. ANTICIPATING CONTROL MANAGEMENT BASED ON STANDARDIZATION

For coal mining system, taking the system steady operation as the target, it establishes standardized anticipating control model of coal mine hidden danger’s information. The chart of the system operation’s flow is shown in figure 1.

IV. CONCLUSION

Coal mining is a complex operating system. In mining complex system, how to achieve the safety goal of production is the major problem that the coal enterprises have to face. Tandardized anticipating control system of coal mine hidden danger’s information which is based on standardization and system science gets our ideas into shape and makes the safety management clear. • Introducing the theory of complex system’s control into coal mine safety management, we can come to the conclusion that if we want to guarantee the coal mining system’s stability and prevent later period accidents to occur, we must ensure the initial condition’s stability as well as preventing long-range correlation’s appearance in the late. • (2)We can achieve hidden danger information’s scientific expounding in standardized anticipating control system of coal mine hidden danger’s information, which constructed by text, number, graph and so on. Simultaneously, on standardized hidden danger information covers danger level, measures, time limit.

REFERENCES

Figure 1. Standardized Anticipating control flow chart