Study on Deterrence of Accountability System Affecting Safety Production in Construction Industry

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Abstract. In recent years, China's construction engineering has witnessed a large number of major safety accidents, which caused the largest number of deaths among all types of accidents in China, resulting in heavy casualties, great social losses, and a wound that is difficult to heal.

In this paper, through the establishment of production safety accountability system for building industry professionals deterrent effect analysis model, to explore the current production safety laws and regulations, for all kinds of building project construction management concept of security and safety behavior of deterrence mechanisms, so as to put forward the effective countermeasures of strengthening the safety management in construction projects, and for the next stage based on the research on large-scale questionnaire prepared to theory. This paper systematically summarizes the accountability requirements of existing laws and regulations on production safety, puts forward the concept of accountability deterrent, and develops the corresponding measurement scale, which is of reference value for strengthening safety risk management of construction projects.

Introduction

According to statistics, the construction industry is one of the industries with the largest number of deaths due to safety accidents in all industries, so the construction industry is considered one of the most dangerous industries, but engineering construction is the basis to meet the basic livelihood security of the people. Facing such astonishing losses, our country monitors and controls construction enterprises through perfect administrative accountability mechanism, and conducts extensive investigations on safety performance issues, focusing on the relationship between safety culture, leadership attitude and safety behavior equal to safety performance [1]. Administrative accountability has feedback on engineering accidents in the Post-reflection mechanism, but also sounds the alarm bell for many enterprises, and increases the supervision of the monitoring department. However, with the passage of time, the serious consequences of the accident are gradually forgotten by people, and the intensity of monitoring is gradually weakened. It is not until the accident erupts again that people realize the huge casualties in the engineering industry. Accountability can indeed affect the behavior of enterprises and reduce the incidence of accidents, but the current research generally ignores the research on the deterrent of accountability. Accountability is an afterthought mechanism, which can not play a good role in the whole process of engineering construction. Accountability deterrent for enterprises is indeed a long-term and effective sustained force. In view of this, this paper mainly studies the deterrent of accountability for enterprises. The deterrent power of the industry is to evaluate the influencing factors of the deterrent power of accountability [2].

Fundamental Theory

Accountability System

Accountability system is a system in which the subject of accountability entrusted with public
power by law or organization investigates the negative consequences of the subject of responsibility and the individual within the scope of its functions and powers. Accountability originated in the West [3].

Western accountability culture is based on the "separation of powers", which is checked and balanced by the separation of legislation, justice and administration. The mutual restriction of the three rights prevents the monopoly of one party. Therefore, western administration is restricted by internal control of its own rights and external power independent of administrative rights. Western accountability mechanism not only comes from internal homogeneous accountability, but also from "heterogeneous" accountability, that is, from the legislative and judicial departments. Similar accountability is mainly embodied in the hierarchical accountability system in Western countries, each level is divided by laws and regulations of rights and responsibilities, the hierarchy is very clear, the superior leadership has the right to accountability to the lower level; there are some special institutions will be accountable to officials at different levels, such as the attorney general and other responsibilities, these institutions also maintain their own internal accountability. Alien accountability originates from the Legislative Department, which plays an important role in restriction. Both Parliament and Congress need to be accountable to the public. Secondly, the judicial organs also play a supervisory role to the administrative organs, which can be achieved through litigation and review.

Deterrence Theory

Deterrence theory refers to a theory of crime prevention in Western criminology. It advocates giving full play to the deterrent role of criminal law in order to prevent crime in general and in particular. The theoretical premise is to balance the gains and losses of intentional offenders before committing a crime with the penalties [4].

Accountability for Engineering Accidents

Accountability for engineering accidents is mainly through exposure in the media, which has a significant impact, and the government will pay attention to the safety construction accidents only after the unreasonable disposal of the state has aroused heated discussion among the people. On this basis, China's accountability system is usually not a proactive accountability, but a passive response to accidents. The deterrence of accountability in China is mainly reflected in the treatment of the object of accountability. After accountability, the object of accountability gets a series of measures, including fines, dismissal and disqualification, which will have an impact on the subsequent operation of enterprises. This is also the deterrence of accountability. The source of force [5].

The size of accountability deterrence mainly depends on three aspects. Firstly, the severity of the results of accountability deterrence is the most important factor affecting the deterrence of accountability. Secondly, the dissemination of the results of accountability will increase the impact of events when the results are known to the industry, and deterrence will also increase the impact accordingly. Finally, the attitude of the state and industry towards events is also the decision of accountability. One of the keys to deterrence.

Analysis of the Current Situation of Safety Supervision and Deterrence in Construction Industry

The supervision of engineering construction in our country is far from in place, the supervision measures can not be implemented, some project site construction is not standardized, in order to ignore the safety regulations, lack of basic safeguard measures, and even some enterprises break the law by breaking the law, illegal construction, stealing building materials, illegal subcontracting, inadequate supervision measures make these enterprises more rampant, construction market chaos. Security is a kind of soft power, which has the characteristics of stability, durability and comprehensiveness. It needs long-term supervision and reflection to construct a security system [6].

350
For large-scale engineering accidents, accountability should be a process of reflection, but it is regarded by the government as a means to calm the public's mood, and the punishment of some officials has not been implemented. The deterrence of enterprises is far from enough. Although most large and medium-sized enterprises have already done relevant training, for many small enterprises and subcontractors, the management mechanism is relatively weak, deterrence is relatively small, lack of appropriate education and guidance, can not convey deterrence. As shown in Table 1, the frequency of engineering accidents in China has remained high, and in recent years there has been a significant upward trend.

Especially for the construction industry, the scope involved is too wide. From the whole process of design and construction supervision, the staff may be the object of accountability. The accountability laws and regulations on construction accidents are imperative [7]. As for the deterrent power of accountability for construction accidents, the inadequate accountability for some engineering accidents is intended to soothe people's emotions and do not do a good job in introspection mechanism, so it can not get a better deterrent effect. China also needs to improve the accountability system, especially for the construction industry, as one of the industries with the largest number of deaths, which needs stricter laws. Supervising, distinguishing responsibilities and powers of all parties, avoiding inconsistent accountability, can also enhance the deterrent of accountability and form a virtuous circle to avoid the recurrence of Engineering accidents.

Research Model

Due to the imperfect construction of accountability mechanism for engineering construction in our country, after accountability, engineering accidents cannot get good reflection and warning effect, lack of reasonable deterrence effect, and the situation of frequent engineering accidents cannot be alleviated. Because of the inherent profit-seeking nature of engineering construction, project decision-makers often choose strategies with higher returns to themselves, reduce the intensity of safety supervision, and reduce investment in safety. In the current environment, deterrence effect is obviously inadequate, so we analyze the causes of deterrence effect of accountability in engineering.

Limited Learning and Understanding of Safety Law

Because of the serious absence of safety education for engineering practitioners in China, for many enterprises, safety knowledge learning is only a process, which does not have its practical significance, so it usually simplifies the learning process and reduces education funds. And a large proportion of engineering practitioners are migrant workers, with large numbers, large mobility, lack of education and weak order. It is more difficult to popularize the education of safety construction law. The lack of safety education makes these people usually pay no attention to their own safety at
work, and they have a sense of luck. They think that safety accidents are only small probability events and will not happen to themselves.

Therefore, it is particularly difficult to popularize the safety construction laws and regulations. It needs long-term study and publicity to enable most practitioners to develop safety construction habits and awareness.

Imperfect Legal System

Legal construction is the basis to ensure the safety of construction, but at present, there is no complete legal Treaty on the accountability of Engineering accidents, and the accountability of engineering accidents will be accountable only when serious casualties occur, lacking clear provisions.

The main engineering accidents in our country are faced with the national standard. Under such a large standard, it is impossible to generalize the engineering accidents in different regions and situations. To reduce the frequency of engineering safety accidents in China, more detailed legal norms are needed.

Insufficient Enforcement of Safety Regulations and Supervision

Insufficient enforcement of safety regulations and supervision is one of the important reasons for safety accidents. Insufficient enforcement exists in supervision units, construction units and government departments.

The inaction of supervision units is quite common in our country. The management ability of supervision units is deficient. Most of the personnel engaged in supervision work are retirees and graduates. The supervision of engineering projects may involve many departments, such as finance, auditing, budget and so on. Different departments supervise different projects. Because of the unclear legal provisions, they can not clearly define the responsibilities of all parties, leading to business overlap or lack of supervision. Once safety problems arise, all parties will shirk their responsibilities, resulting in no institution to assume responsibility for the accident.

The Absence of Social Public and Public Opinion

At the same time, for Western countries, there is a serious lack of heterogenous accountability, especially from the public and the media. Homologous accountability may be relaxed due to stakeholders and other reasons, but the existence of heterogenous accountability can deal with accidents fairly and fairly. But for the media and the public, at present, they do not have the ability of accountability for accidents, but through the pressure of the government and related departments to achieve accountability for accidents.

Enterprise Safety Culture to be Established

Human behavior is the most important cause of engineering accidents. This paper analyses the influence of technology, resources, education and organization on human behavior as the main reason. These four aspects are from the enterprise level, the impact on human behavior.

From the technical point of view, the construction industry of our country is not strong enough for the safety management of Engineering construction, the construction of safety management is not perfect enough, the measurement of construction risk is not clear enough, potential hazards can not be found in time, often after causing serious consequences, the existence of hazards will be realized. Therefore, our country needs to strengthen the ability to identify and monitor hazards.

Resources mainly come from human and financial input. Safety management practitioners are usually simply trained, and the number of people is obviously lacking. Most experienced safety supervisors manage several sites at the same time, and they do not have enough energy to manage each site carefully. The concept of safety determines its own safety situation.

At the level of education, large and medium-sized enterprises in China may pay more attention to the education of safety in production, but the workers engaged in construction mainly come from
migrant workers, who are too mobile and generally not well educated. China needs to popularize basic safety construction education, construct safety culture, ensure basic education for engineering practitioners, raise safety awareness, avoid taking chances, and build a safe and green construction site.

At the organizational level, it mainly includes two aspects: the construction of enterprise safety culture and self-supervision. Safety culture is an inherent soft power formed by long-term cultural accumulation of enterprises. The key point is to establish safety values of enterprises. Safety values are the concept of safety for the whole group of enterprises. The establishment of self-inspection system can effectively help enterprises identify common hazards, and take precautions against known risks. At the same time, enterprises should constantly update the prevention system to reduce the frequency of safety accidents.

**Study Model Hypothesis**

For the current situation of safety management in China, the model shown in Figure 1 is established. After the analysis of the literature, the hypothetical model of accountability deterrence is constructed from three aspects: the cognition and learning of safety law, the perfection of safety law, the supervision and enforcement of safety regulations. Find out some factors that influence the deterrence of accountability, choose corporate safety culture and public opinion as intermediary variables, and establish a hypothesis model of deterrence based on intermediary variables.

According to the current research situation in China, the learning situation and cognitive ability of safety law in China are obviously insufficient. The most important thing is the lack of index system related to safety education and awareness. According to the relevant research, it is found that the awareness and awareness of safety law can greatly improve the safety performance of enterprises, so it can be inferred that the learning of safety law has a significant impact on the deterrence of accountability. The perfection of law will be directly related to the accountability ability of accidents. A perfect safety law can reasonably regulate the rights and responsibilities of managers and avoid the situation of different powers and responsibilities. It can be as fair as possible for the accountable objects and reduce the possibility of evading responsibility. Therefore, it is assumed that the perfection of law can greatly enhance the deterrence of accountability. The supervision ability and execution ability of safety accidents are obviously insufficient, lacking the corresponding financial and material support, especially the supervision ability, lacking the corresponding scientific research foundation, and the execution ability can not meet the construction demand of our country which has increased greatly at present. However, the strengthening of supervision and execution ability can really raise the attention of employees to safety, so we speculate about safety. Supervision and enforcement also have a significant positive impact on accountability deterrence.

Therefore, we propose the following research hypotheses and corresponding mediating variables

H1: Learning and understanding of safety law has a significant positive impact on accountability deterrence.

H2: The perfection of safety law has a significant positive impact on the deterrence of accountability.

H3: Supervision and enforcement of safety regulations have a significant positive impact on accountability deterrence.

M1: Individuals with high awareness and learning ability of safety law are more likely to be influenced by the public and public opinion.

M2: Individuals with high awareness and learning ability of safety law are more susceptible to the influence of corporate safety culture.
The perfection of safety regulations is more easily influenced by the safety culture of enterprises. Safety regulation and enforcement are more vulnerable to the impact of corporate safety culture.

**Conclusion**

Through the above analysis of construction safety accident accountability, we summarize the main influencing factors, so for these factors, we need to put forward corresponding countermeasures to prevent the occurrence of safety accidents and improve safety performance.

For China's engineering industry, the occurrence of engineering accidents is too common, the legal penalties are too light and the regulations are not clear, which leads to the chaos of the engineering management market in China, and can not form a good monitoring mechanism to prevent the recurrence of engineering accidents. The low cost of making mistakes, the low impact on the reputation of enterprises, the low cost of crime, and the huge rewards, make the situation of engineering accidents in China not optimistic. In addition, China has increased the process of modernization, the number of construction sites is increasing, which increases the difficulty of management.

China should learn from Japan's engineering management methods. In the case of accidents at Japanese construction sites, the compensation for one person who died is 100 million yen, and he can not participate in government project bidding within three years. The project leaders are all dismissed and apologized in front of the media. Japan's construction site will implement safety management into its entire system, especially in the construction of its safety culture. For every employee working in the site, receiving safety education is a daily work. Every morning meeting, safety Kanban and monthly safety color are the penetration of Japanese safety culture to every employee's safety consciousness. Therefore, the accident rate of Japanese engineering is very low, and this management mode of safety concept needs our study.

This method needs long-term development to be realized in our country. Firstly, for the establishment of rules and regulations, we need to establish a perfect legal system to produce sufficient constraints and effective supervision mechanism to monitor and control accidents. Secondly, we need to improve the safety concept of the whole people. Human behavior is the main cause of accidents, and we have enough safety concepts to prevent accidents. The occurrence is very important, especially for the extensive migrant workers on the construction site, because of excessive mobility and lack of education, they are more indifferent to accident safety attitudes, and need to strengthen their vigilance to safety; finally, improve the access threshold of the project, because of the low access threshold of the project construction nowadays, especially for the construction of the engineering team, there are many irregular places. On the other hand, we need to raise the entry threshold of the project in order to improve the safety performance of the project.

This paper theoretically studies the deterrent effect of accountability and its influencing factors, and puts forward corresponding countermeasures to prevent the occurrence of inadequate accountability. However, due to the lack of empirical research, this paper cannot effectively prove the existence of deterrence of accountability for safety incidents. Further empirical analysis is needed to complete the research on this aspect.

**References**


