

# Research on Petrochemical Production Safety Management Based on HSE Management System

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**Abstract:** With the continuous improvement of people's living standards and the growing material and cultural needs, people have become inseparable from the convenience brought by chemical products. There are flammable, explosive, toxic and hazardous substances in the production of these chemical products, which can easily cause a series of production safety accidents if not well managed, so the safety management of petrochemical enterprises is particularly important. Based on the HSE management system and combined with relevant theories, this paper describes the current safety situation and characteristics of the petrochemical industry, explores the current safety hazards, and proposes corresponding countermeasures to solve them.

**Keywords:** Safety Production; HSE Management System; Hazard Identification; Security Management

## 1. Introduction

With the acceleration of industrialization, the industrial level has been continuously improved, and safety has gradually become the most important issue in the industrial production process. Research on industrial safety management issues first originated during the first industrial revolution, while China's research in this area began in the 1980s. It is known that the petrochemical industry is a high-risk industry, and safety accidents are very likely to occur in the production process. Therefore, the study of petrochemical safety management in this paper has important theoretical significance for the improvement of petrochemical companies in safety management.

## 2. Theoretical overview

### 2.1 Enterprise Safety Management

There are different definitions of "production safety" in related books. Some define "production safety" as a series of safety measures and guarantee activities to form a good labor environment in safe and effective work order, to prevent unnecessary personal injuries during the production process, and to ensure the normal operation of the equipment.<sup>[1]</sup> Some interpret "production safety" as an important policy in the production process to ensure that the lives of workers are effectively protected. The management of the enterprise should take production safety as the highest principle to comply with, and effectively protect the workers from work-related accidents and occupational diseases so that the life and health of workers are effectively safeguarded in the production process.<sup>[2]</sup>

According to the modern viewpoint of system safety engineering, production safety is to achieve the following purposes by taking reasonable arrangements among the operating states of personnel, materials, machinery and environment: 1. To prevent various potential danger factors from arising in the process of production activities of the enterprise, so that the hidden risks of accidents are always kept in a controllable state. 2. To prevent production accidents such as casualties and property losses so as to achieve the purpose of protecting the health and lives of workers. 3. To control the sources of danger, and to achieve the purpose of gradually eliminating dangerous and harmful factors, so that production equipment and security facilities can be protected from damage, while the natural environment can also be well protected.<sup>[3]</sup>

Production safety management is a component of safety science, which refers to the efforts of people to achieve the harmony of machinery, materials and environment in the production process.<sup>[4]</sup> Production managers make effective decisions and reasonable plans, make full use of effective resources, solve people's safety problems in the production process by organizing safety learning and

controlling unsafe activities so as to achieve the purpose of safe production.<sup>[5]</sup> The goal of production safety management is to control and reduce dangerous accidents by establishing a reasonable management system to avoid safety accidents in the production process that brings personal injury, property damage, environmental pollution and other losses.

## **2.2 HSE Management System**

### **2.2.1 Concept of HSE Management System**

HSE comes from the initials of Health, Safety and Environment, and its concept is to determine whether there are possible hazards in its own production activities through prior risk analysis, and to predict the consequences of the hazards and take effective preventive measures and reasonable management methods to prevent them. The HSE management system fully reflects the idea of “people-oriented” management, emphasizing the commitment and responsibility of top managers, focusing on continuous improvement, and stressing on accident prevention.<sup>[6]</sup> Based on the participation of all staff, it highlights the goal of zero accidents, attaches importance to risk assessment and hidden danger management, and emphasizes the independence of auditing.

### **2.2.2 Development of HSE Management System**

HSE management system originates in the early days of industrial development. Due to the backwardness of industrial production technology in this period, people did not realize the negative effects of this production method on mankind at a deeper level, only blindly and destructively exploited natural resources.<sup>[7]</sup> The deepening development and improvement of safety was due to international far-reaching, major accidents. These accidents have attracted the great attention of safety managers, who are acutely aware that in industries with high-risk industrial practices including petroleum, petrochemical and chemical, measures such as the establishment of a sound safety, environment and health management system must be taken in order to reduce the occurrence of major safety accidents and to avoid major pollution of the surrounding environment.

Since the management of safety, environment and health are similar in principle and effect, and in practice are inextricably linked to each other, it is important to integrate safety, environment and health into a complete management system. Dutch Shell issued its guidelines for HSE in 1991. In the same year, the first international conference on health, safety and environment (HSE) in oil and gas exploration and development was held in Hague, Netherlands, where Shell is headquartered. In 1994, a major conference on oil and gas development was held in Jakarta, Indonesia, where participants discussed in depth how to manage safety, environment and health. The success of this conference has enabled the rapid development of HSE activities around the world.<sup>[8]</sup> The HSE management system is the inevitable product of the development of modern industry over a period of time and its formation and development is the fruit of many years of experience in modern industry. As a new production safety management system, HSE has been accepted and recognized by many modern and large companies around the world, and has gradually become a common code of conduct followed by these multinational companies.

### **2.2.3 Implementation principles of HSE management**

Nine principles of HSE management

(1) Health, safety and environment are the priority conditions that must be considered before making any decision

Good HSE achievement is the strong foundation and driving force for the company to achieve excellent performance and establish a good social image. In order to realize the safe and clean development of the company, HSE work should first be effectively controlled from the beginning stage of safety accidents, and the prevention of accidents should be made precise and realistic by adding HSE management clauses when formulating the company's strategic plan for safety development. In the company's project investment and production and operation activities, HSE risk assessment is conducted first to consider whether there are potential accident risks. When implementing control measures against risks, make HSE a priority.

(2) The company must provide HSE training to employees

Receiving HSE training is the basic right of enterprise employees and an important duty of HSE work. The managers of the enterprise should provide safety management training to the employees for a long time and without interruption. If the employees have rich HSE knowledge, master excellent HSE

skills and also have keen HSE awareness, they will effectively protect their own safety in future production activities. Therefore, all employees must take the initiative to receive HSE training, pass the assessment and obtain the appropriate qualifications before they step into their jobs.

(3) Employees must participate in workplace hazard identification and risk control.

Hazard identification and risk assessment is the foundation of all HSE work and is a mandatory job responsibility for employees. Hazard identification and risk assessment must be carried out before any production activities. Employees should take the initiative to participate in hazard identification and risk assessment of their jobs in order to be familiar with the possible risks in their work and to avoid accidents, and to master the methods to prevent accidents from occurring.

(4) The hidden danger of accidents must be corrected in time.

Hidden dangers that are not effectively eliminated and removed, there is no normal production life of the enterprise. All hidden dangers, including unsafe behavior of enterprise personnel, should be corrected as soon as they are discovered. If it cannot be corrected at one time, it should also be given a limited period of modification, and the safety hazards must be eliminated within the specified period. If necessary, take monitoring means to track the correction process and verify the effect of correction to ensure that the correction achieves the expected results.

(5) Managers at all levels are responsible for the health and safety environment within the scope of their operations.

HSE responsibilities are an important part of job responsibilities. Managers at all levels should supervise the health of personnel, safety management and environment in their responsible areas or business functions according to HSE management regulations, develop a proven safety management system, improve the HSE management system, strengthen the implementation of the management system, provide appropriate resources, and continuously improve HSE management.

(6) All accidents must be reported, analyzed and handled in a timely manner

Safety incidents are also a resource. Each production safety accident can be an important opportunity for business managers to improve the management system, and the analysis of the safety situation and problem discovery is of great significance. In the usual work, employees and basic units are encouraged to find accidents and report them, and to form this into a mechanism and improve it continuously. In the work, we should take the principle of "four no's" as not letting go of accidents whose causes have not yet been determined, not letting go of accidents whose responsible persons have not yet been dealt with, not letting go of accidents whose corrective measures have not yet been implemented, and not letting go of accidents whose related personnel have not been educated, and report large or small safety accidents in time to quickly identify the causes and take corrective measures to eliminate safety hazards. We will take corrective measures to eliminate safety hazards. We share the accident resources throughout the enterprise and learn from them to avoid the recurrence of the same incidents.

(7) Make safety a necessity for employee recruitment

Compliance with corporate safety rules and regulations is a mandatory obligation for an employee of a company. Receiving safety training and passing an examination before joining a company is a necessary condition for becoming an employee of a company. ① Good safety training results are a prerequisite for a company to hire employees. Before hiring a new employee, the company should consider the employee's safety awareness, safety skills and historical performance as prerequisites for examining the employee, and will not hire anyone who does not pass the grade in safety training. Managers and operators at all levels should enhance their sense of safety responsibility and mission, improve their own safety awareness, conscientiously perform their safety duties, and continuously improve the overall quality of personal safety.

(8) Implement uniform HSE standards for contractors

In the internal HSE management system of the enterprise, the HSE management of the contractors is incorporated together to implement unified management. And the accidents occurred by the contractors will be included in the accident statistics of the enterprise itself at the same time. This will urge the contractors to strengthen the establishment and implementation of their own HSE management system standards according to the requirements of the enterprise's relevant management system, so as to achieve the same standards as the enterprise. Strengthen the internal management of HSE training and personal protective equipment for employees of outsourcing companies to continuously improve

HSE effectiveness and meet the requirements of enterprises.

(9) Managers should play an exemplary role and be at the forefront of HSE reviews at all times

The management personnel of the enterprise, the cornerstone of the enterprise to promote the implementation of HSE management system, is the forerunner of the enterprise HSE management, and should always strictly require themselves to play an exemplary role among the employees of the enterprise. Before conducting on-site inspection, they should master the rules of HSE management. In the internal audit and management review to find and improve HSE management defects, continuous improvement of HSE performance in an effective way to promote the continuous development of HSE management.

### 3. Petrochemical industry safety status

The production of petrochemical industry is characterized by flammable, explosive, toxic and corrosive, and most of the devices are in continuous operation under high temperature, high pressure, low temperature and negative pressure, etc. It is of great significance to maintain the stable production and safety of the whole device and the whole plant under such special production conditions. Refining and chemical enterprises take crude oil as the production raw material and produce a variety of petroleum and petrochemical products such as gasoline, diesel oil, kerosene, liquefied gas, petroleum aromatics and various lubricating oil materials through primary processing and multiple processing, and get finished fuels and production raw materials for downstream enterprises in the production process. In the production process, there are all kinds of production and safety hazards, coupled with improper operation and design process and equipment defects caused by human reasons, it is very easy to have major fire and personal injury accidents.

Accidents in the petrochemical industry have long been common, and due to the special nature of the petrochemical industry, these accidents not only bring incalculable losses to the relevant enterprises, but also seriously threaten the safety of the state and people's property. Although China has carried out the production responsibility system early, and the administrative and criminal laws and regulations have been improved, however, in the process of implementation, due to the differences in enterprise funds and personnel quality, the expected purpose has not been achieved, and large or mega safety accidents still occur from time to time. Therefore, the establishment of a sound petrochemical industry production safety construction and in-depth implementation has become an urgent task.<sup>[9]</sup>

China was one of the first countries in the world to discover and utilize petroleum resources, and petrochemical enterprises are those that use crude oil and other similar substances existing in nature and use suitable processing methods to make a series of products that provide human survival. Due to historical reasons, China's petrochemical industry only started in the 1950s. In recent years, China's petrochemical industry has maintained the momentum of rapid growth, increasing its comprehensive strength, expanding the scale of the industry and contributing greatly to the growth of the national economy. In terms of the refining and chemical segment, more than ten refineries with 10 million tons of oil refining scale have been built one after another. Although the progress is huge, the problems behind the rapid growth of the petrochemical industry are also very obvious. Among the outstanding problems are: the degree of intensive development is low, the degree of industrial layout is not high, relatively scattered; innovation capacity is not strong, the effect of primary processing is relatively low, and high-end product production technology and large sets of processing equipment is still mainly dependent on imports; product structure is not reasonable, long-term planning goals are not clear, the proportion of low-end products is still very large; product processing conditions and resource environmental protection are still mutually constrained. There is no synergistic development; agricultural supply needs to be strengthened, low-cost product capacity is insufficient, and the market regulation system is not perfect, such as PX projects and coal chemical projects are still controversial.

Since the second half of 2008, affected by the international financial crisis, the petrochemical industry has been greatly impacted by the shrinking domestic and international markets, and the low level and high consumption of oil extraction in China in contrast to the continuous decline in foreign crude oil prices. Domestic and international markets shrink, production continues to decline, enterprise inventory increases, prices fall sharply causing the industry's economic benefits decline, survival conditions are difficult, and in the process of production safety accidents occur frequently, can not fully ensure the safe and stable production needs. The petrochemical industry is a high-risk industry, the safety of the production process has been more and more attention, belongs to the petrochemical industry, most of the raw materials, intermediate products are dangerous chemicals, in the production,

operation, storage, transportation, use and waste disposal process of these products, if personnel awareness or improper management, technical protection, will greatly damage human health, cause property damage, pollution The environment we depend on for survival.<sup>[10]</sup>

#### **4. Petrochemical industry characteristics**

With the continuous development of the petrochemical industry, safe and stable production has become the focus of attention. Unlike other industries, the characteristics of the petrochemical industry are mainly manifested in the following aspects.

(1) flammable, explosive, toxic, corrosive petrochemical process from raw materials to the final product and the production process intermediates, semi-finished products, pharmaceuticals, additives and other products are mostly flammable, explosive, easily toxic products, and most of them are gases or liquids, very easy to volatilize and escape, and the normal production conditions are high temperature, high pressure, deep cold, vacuum, this production conditions of the products escaped and particularly Due to the production requirements or process conditions, a large number of open flames are used in the production process, and this production contradiction is always testing the employees, once an accident occurs, the consequences will be unimaginable. Most of the petrochemical process products belong to organic hydrocarbons and are accompanied by heavy metals, and other toxic and harmful substances such as fluoride, sulfide, cyanide, etc. are generated during the production process. Sufficient attention should be paid to the production process to avoid dangerous accidents as much as possible, and corresponding measures should be taken, otherwise not only will cause acute poisoning events, but also with the accumulation of toxic substances over time, more serious chain reactions will occur. The petrochemical production process is full of corrosive hazards, often using some strong acids and bases as solvents, and these chemical products have different degrees of harm to the equipment and human body. And some intermediate products are corrosive in themselves, for example, crude gasoline contains sulfide, which will turn into other forms of sulfur in the process of transportation and storage, which will have corrosive effects on equipment and pipelines.

(2) In order to reduce operation and production costs, the production scale of the petrochemical industry is gradually becoming larger, more integrated and continuous. For example, polyester production units in China have reached over 500,000 tons/year, olefin production units have exceeded 480,000 tons/year, and 10 million refinery production units have become commonplace and have maintained a continuous growth momentum.

(3) The process and public works of oil refining process from the initial raw materials to the final product, need to go through a number of consecutive production units, after a number of chemical, physical reactions to finalize, in this process requires water, gas, electricity and other public works with the entire process, the device is closely linked to each other, with the whole body.

#### **5. Safety hazards in petrochemical enterprises**

##### ***5.1 Petrochemical Enterprises Lack a Sound Safety Management System***

Petrochemical enterprises as a more concentrated hazardous materials, a slight inadvertence will lead to major accidents, the light loss of property and equipment, serious will threaten life, causing untold losses, so petrochemical enterprises to abandon some enterprises do not pay attention to safety management, do not improve the wrong practice of safety management system, and actively carry out the construction of enterprise safety management system, the formation of a sound safety management system, in the production of increased investment in safety Therefore, petrochemical enterprises should abandon the wrong practice that some enterprises do not pay attention to safety management and do not improve safety management system, actively carry out the construction of enterprise safety management system, form a perfect safety management system, increase the investment in safety management in production, avoid safety hazards accompanying the production of petrochemical enterprises, and lay a good safety foundation for the sound development of petrochemical enterprises.

##### ***5.2 Safety Management Technology of Petrochemical Enterprises Is Backward***

Petrochemical enterprise development relies on professional knowledge, excellent technology, but some chemical enterprises in their own safety management technology, but stingy with investment,

resulting in its safety management technology is less than the production technology, the emergence of the barrel principle, the short board effect, restricting the higher and better development of petrochemical enterprises. The safety management technology of petrochemical enterprises should pay particular attention to the construction of flame arresters and fire and explosion-proof related measures, but in actual management, petrochemical enterprises are only put into production in the early stages of inspection, hindering the implementation of safety management work, and not as required for the regular inspection of equipment.

### ***5.3 Petrochemical Company Staff Safety Awareness Is Not in Place***

Petrochemical enterprises with the rapid development of social and economic development is also like a spring, rising, more enterprises to join the wave of chemical production, but with this comes a sharp increase in the demand for petrochemical practitioners, the shortage of petrochemical professionals in society, there is a shortage of supply, petrochemical enterprises began to appear low degree of specialization of the practitioners. Non-professional personnel because of the influence of professional, lack of safety management awareness, coupled with the late training is not in place, resulting in a large number of non-professional petrochemical enterprises on the existence of great safety management risks, is not conducive to enterprise safety management work.

### ***5.4 Safety Hazards in Engineering Quality of Petrochemical Production Plants***

During the construction of petrochemical production plants, high-quality engineering construction is also an important part of preventing accidents from occurring. Analyzing the current engineering status of petrochemical production plants in China, we found the following safety problems that need to be solved.

### ***5.5 Lack of Good Quality Management System***

In the chemical production plant, the equipment and instruments and materials used cannot be effectively inspected and checked, and the responsibilities of the staff cannot be clarified to further guarantee the quality and safety of the construction: the relevant provisions of the process documents cannot be effectively implemented and enforced.

### ***5.6 Lack of High-Tech Science and Technology Application and Implementation***

In the implementation of petrochemical engineering, the applied technology and equipment are relatively backward, the quality of personnel is not high, and the quality of the project is inevitably not effectively improved. Enterprises cannot introduce new technologies and new techniques and apply advanced construction techniques due to excessive consideration of cost investment, and thus cannot guarantee the quality of construction.

### ***5.7 The Safety Management of Petrochemical Enterprises Is More Complex***

The amount of capital investment in safety management in petrochemical enterprises is relatively large, and in the context of the new normal of economic development, the managers of petrochemical enterprises tend to focus only on short-term interests, without realizing the importance of perfect safety management for the sustainable development of enterprises, in the context of the development of the new era, it is necessary to combine practical experience to continuously improve the safety management system of enterprises. To ensure the sustainable development of petrochemical enterprises, it is necessary to strengthen the awareness of safety management initiative of enterprise safety managers. Only with all-round management of the whole process of operation can safety be achieved, therefore, it is necessary to strengthen the systematic awareness of safety supervision and management personnel, so as to ensure the relative safety of hazardous operations in petrochemical enterprises and reduce the incidence of safety accidents.

## **6. Means and methods of safety management in petrochemical enterprises**

### ***6.1 Security Inspection***

The HSE management system especially emphasizes the important role of safety inspection in the company's safety management. The safety inspection is to detect the hidden danger of the company's production accidents in time so that corresponding measures can be taken to eliminate the hidden danger. By organizing the staff to participate in the learning and training activities about the regulations and rules of HSE safety management and the experience and methods of safety inspection, they can have a higher ideological awareness and professional skills in safety inspection and their self-consciousness of safety inspection can be improved. Through self-inspection, hidden dangers can be found and solved as early as possible to meet the inspection team's need, so that staff self-inspection and inspection team can be combined to form a situation of self-inspection and self-correction, while investigating and improving.

To form a system of regular safety inspections within the petrochemical company, it is necessary to determine the purpose, steps and methods of inspection, draw inspectors and arrange the inspection schedule. The safety inspection organization should be structured so that the corresponding inspection work can be institutionalized, the specific inspection responsibilities can be clarified, and the system can be used to make the responsible persons for different inspections clear. For the specific contents of the inspection project, inspectors need to study the relevant business knowledge, laws, technologies and policies, so that they can improve their own law, policy and business skills. Share information on a series of accidents that have occurred in the past few years, and use cards and forms to record the types of accidents, the number of times they have occurred, and protective precautions according to specific needs, in order to draw the inspectors' attention. Understand the process, production and risk factors of the inspected object, and prepare the necessary testing tools, instruments and labor protection devices. Prepare safety checklist for item-by-item inspection to prevent missing items to be inspected.

According to the regulations and the "four not let go" principle of accident handling, we organize the corresponding processing and investigation of accidents that occur during safety inspection. In the process of handling and investigating workplace accidents, the "four not let go" refers to not letting go of any point of the cause of the accident, not letting go of the education of those responsible for the accident and the public, not letting go of any preventive measures not taken, and not letting go of the handling of those responsible for the accident.

### ***6.2 Hazard Identification***

Hazardous sources are parts, areas, places, spaces, positions, equipment and their locations in a system with potential energy and material release danger that can cause injuries to people and can be transformed into accidents under the action of certain trigger meanings. HSE management can effectively analyze the risk factors in the company's internal production. The company's employees must master the method of using the knowledge of HSE management to identify the possible sources of hazards in production activities in a timely manner, in order to develop risk control measures, eliminate and reduce safety risks, and avoid all kinds of safety accidents. To deal with a series of risk sources that occur frequently and can have a great impact, preparation should be made in advance. In the preparation plan, detailed steps of operation need to be included, so that even if the situation that arises does not match with the vision and the initiatives used change, certain reference can be made. For that part of the risk sources that appear less frequently and cause less impact, only the follow-up supervision work is needed, and there is no need to start dealing with them quickly. Therefore, a specific mechanism should be established to evaluate the level of risk sources, so that the degree of impact can be determined after the risk source is identified, and then the timing of treatment can be determined.

### ***6.3 Establish HSE Three-Level Safety Education and Training System for Grassroots Staff***

A three-level HSE safety training and education system is formed for the grassroots staff. After entering the company, the first level of induction HSE training is organized by the security department. After being assigned to functional departments, workshops or branches, the second level of HSE education and training is organized by the department. On specific position, the third level of HSE education and training is led by the same position of veteran staff.

Among them, the first level is the induction HSE training and education: those who need to participate in this training include employees who have just been transferred and trainee staff who have newly entered the production work area of the enterprise. Before these employees can officially enter the workplace, they are required to participate in HSE education and training activities on safety in production. The training covers a range of HSE safety procedures and regulations, the overall situation of the company's production and relevant HSE professional skills.

The second level is the departmental HSE education training, which is very systematic and requires the participation of transferred staff and new workers who have just entered the workplace to receive the appropriate HSE training for the safety work they need to perform. These employees need to have an in-depth understanding of their main tasks, the nature and area of their work, and repeatedly learn about the specific processes of production operations and disaster prevention and relief initiatives.

The third level is the position HSE training, which is highly professional, relevant and practical, and requires staff to attend HSE training activities before they formally enter their jobs. The training includes the standards and regulations of the job. Strong professional knowledge and lessons learnt by experienced staff are required, making it an essential safety lesson for incoming staff.

#### ***6.4 Strengthen the Management of Equipment and Facilities to Enhance the Essential Safety Level***

Equipment and facilities include production-related equipment and safety and facilities. Petrochemical enterprises should introduce more advanced production equipment and production technology, while strengthening the management of production equipment and facilities, timely inspection tours, regular maintenance and testing, as well as strengthening the predictive maintenance, in advance of the device production and operation problems, quality and quantity to complete the device three years or four years of overhaul work to ensure that the device in normal operation. Safety equipment and facilities are used to prevent, control, reduce and eliminate the impact of accidents, are important means and measures to prevent accidents and reduce losses. Enterprises should fulfill the management responsibility of safety equipment and facilities, establish and improve the safety equipment and facilities ledger so that from managers to front-line employees can accurately grasp the use and operation of safety equipment and facilities. Enterprises should strengthen the supervision of safety equipment and facilities maintenance inspection work, to ensure that safety equipment and facilities in normal operation, and strengthen the operation and maintenance of safety equipment and facilities training, so that the operator can correctly operate and maintain safety equipment and facilities.

#### ***6.5 Strengthen the Management of Major Sources of Danger and Curb Dangerous Chemical Accidents***

Most accidents in petrochemical companies are related to the special nature of hazardous chemicals. In 2011, twelve accidents occurred in petrochemical enterprises nationwide, all of which occurred in enterprises with major sources of hazards. The concentration of energy in major hazards and the destructive power of an accident make the management of major hazards in the safety management of petrochemical enterprises crucial. In 2021, the Ministry of Emergency Management issued the Measures for Safety Assurance Responsibility System for Major Hazardous Sources of Hazardous Chemicals Enterprises (for Trial Implementation), which requires the enterprises concerned to improve the safety risk control system of major hazardous sources of hazardous chemicals, to clarify the main person in charge of major hazardous sources, the technical person in charge and the person in charge of operation, and to implement safety assurance for major hazardous sources from three levels of overall management, technical management and operation management. As a major risk source enterprise, in addition to clarify the relevant responsible person, should also implement relevant safety management measures: the development of major risk sources of safety production rules and operating procedures, the preparation of major risk sources of emergency response plans and regular organization of exercises, to carry out major risk sources of safety risk investigation and other measures to ensure that the supervision and management of major risk sources in a comprehensive manner to ensure that it is under control.

## **7. Conclusion**

Petrochemical enterprises to solve the problems in safety management, the primary solution is the



ideological awareness of the problem. Improving the enterprise's awareness of safety management can make people inside and outside the enterprise, large to the community, small to the staff, work together to identify problems, solve problems in a timely manner, so as to establish a safety management model in good operation of the enterprise, to truly promote the enterprise safety management and achieve safe production of chemical enterprises.

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