

# Exploration on the Training of Safety Engineering Professionals in Colleges and Universities based on Local Development

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**Abstract.** In order to make Longdong University's safety engineering specialty more practical and better serve the regional economic development, this paper analyzes the subject construction and employment development of safety engineering specialty in domestic universities, combining with the construction plan of Qingyang National Energy Base in Gansu Province, and the characteristics of main industries and the trend of economic development in Longdong area. On the basis of "unconventional natural gas development project" as a key training discipline at school level, the author has made optimum adjustments from five aspects: personnel training program, teaching curriculum system, teaching team building, practical training base construction inside and outside the school, and professional culture construction, so as to broaden the direction of safety engineering specialty and construct coal bed methane development and development. Using the relevant teaching practice system and combining with the regional energy development strategy of "Qihua Qingyang", we can expand students' employment and better serve the local economic and social development.

**Keywords:** Regional Development; Talents Training; Safety Engineering; Professional Development.

## 1. Introduction

Since the Eighteenth National Congress of the Party, the Party and the state have attached great importance to safety in production, taking safety in production as a major event of people's livelihood and bringing it into the important content of building a well-off society in an all-round way. With the continuous development of safety production in China, the concept of safety supremacy has become the consensus of the whole society. This has greatly promoted the development of safety engineering specialty, and put forward higher requirements for the training of safety engineering professionals. Safety engineering is an engineering specialty which integrates social science and natural science. It covers a wide range of knowledge and involves all aspects of our daily life and production. China is in a period of rapid economic development. Frequent safety accidents have seriously hindered the harmonious and stable development of society. It is urgent to have a large number of safety expertise. High-quality professionals with emergency rescue and safety management [4].

## 2. Construction and Development of Safety Engineering Specialty in Domestic Universities

### 2.1 Demand for Professionals in Safety Production

Since the Eighteenth National Congress of the CPC, the CPC Central Committee, with Comrade Xi Jinping as its core, has repeatedly stressed the importance of safe production to social stability and development, and attached great importance to the red line of safe production. The new "Safety Production Law" in 2014 has made new provisions on the staffing of safety management personnel in production enterprises, requiring registered safety engineers in high-risk industries such as mines and non-coal mining enterprises, production and storage units of hazardous chemicals, and units with more than 100 employees in other industries should be equipped with full-time safety production management personnel. In the new era, the demand for safety professionals in social production is very large, and the employment prospects of safety engineering students are very broad [5]. Its

employment is mainly distributed in mines, construction, petrochemical industry and so on. Mainly engaged in disaster prevention and safety management in mining enterprises; engaged in on-site safety inspection and management in construction industry; engaged in EHS engineers in petroleum dangerous industry; engaged in safety evaluation and occupational health prevention and control services, as well as some training institutions engaged in safety teaching and training; engaged in safety management and risk assessment at the government level in government, enterprises and institutions. Estimate the work.

## **2.2 Development Trend of Safety Engineering Specialty in Domestic Universities**

The predecessor of safety engineering specialty is mine ventilation and safety, which is the second-level discipline under the First-Level Discipline of mining engineering. With the development of safety science, safety engineering has gradually expanded from the initial mining industry to hazardous chemicals, aerospace, transportation, construction and so on. It has penetrated all aspects of daily life and production. Therefore, in 2011, the Academic Degree Committee of the State Council listed safety science and engineering as a first-level discipline. At present, there are more than 180 safety engineering colleges and universities in China, and they are still increasing year by year.

## **3. Professional Survey of Safety Engineering in Longdong University**

### **3.1 Professional Survey and Development**

The major of safety engineering of Longdong University was established in 2011 and is set up in the College of Energy Engineering. The students trained are mainly serving Gansu and the surrounding northwest areas. With the aim of training first-line basic mining safety engineers, they are required to master the basic theory and professional knowledge of engineering, have the ability to analyze and solve safety problems, and be able to engage in safety design, inspection and testing in the field of mining engineering. Applying talents for evaluation, supervision and management.

At present, the professional team has reasonable structure, high teaching level and strong scientific research ability. It consists of more than 10 full-time and part-time personnel with an average age of 38 years. Among them, one professor, three associate professors and 10 teachers with postgraduate or higher education (including three doctorates) can satisfy the normal teaching and scientific research work, and many teachers have good teaching and scientific research foundation in the direction of coal bed methane development.

### **3.2 Necessity of Professional Direction Expansion**

The development and utilization of coal and coalbed methane in Longdong area of Gansu Province is a key construction project in Gansu Province, and the rapid development of enterprises needs corresponding personnel guarantee. At present, the key coal enterprises in Gansu Province, such as Huating Coal Industry Group, Jingyuan Coal Industry Group, Yaojie Coal and Electricity Group, are facing many problems, such as weak technical force, insufficient research and development, shortage of professional and technical personnel, etc. Other coalfield coalbed methane development projects are also under way, and they are engaged in the first-line coalbed methane development in the commercial production and operation of coalbed methane. There is a serious shortage of post operators, and high-quality technical and skilled professionals engaged in coalbed methane production and management are even more scarce.

At present, the undergraduate major of "Coal and Coal-bed Gas Engineering" has only five pilot majors of the Ministry of Education in the country. It is still a new major in China. The quantity and quality of personnel training are seriously disjointed from the industrialization process of coal gasification development and utilization. Gansu Province is rich in coal resources, especially in Longdong area. The reserves of coal resources are about 136.34 billion tons, accounting for 96% of the reserves of coal resources in Gansu Province. Coalbed methane, as an associated resource of coal, has abundant reserves, accounting for about 1/25 of the whole country. It has broad prospects for development and utilization. At present, there is no "coal and coalbed methane engineering" specialty

in Gansu Province. Based on this, Longdong University proposed the construction project of coal-bed methane development direction of safety engineering to solve the bottleneck problem of talent demand in regional industry development.

## **4. Thoughts and Measures for the Construction and Development of Safety Engineering Specialty in Longdong University**

### **4.1 Optimizing the Program of Talents Training**

At present, there are few colleges and universities in China to expand the direction of coal-bed methane development in safety engineering specialty. Several colleges and universities have effectively expanded the direction of coal-bed methane development in mining engineering and geological engineering specialty, and there are no mature talent training programs, curriculum system and professional courses for reference. Teachers also have no corresponding practical experience. According to the urgent needs of enterprises for talents, how to build specialty? How to cultivate the technical and skilled talents urgently needed by enterprises is an urgent problem to be solved.

On the basis of extensive investigation on the development background of domestic coalbed methane industry, the construction team of safety engineering specialty in our university has further carried out multi-channel and multi-form investigation and Research on the professional related employment posts, development posts and requirements for professional talents, professional curriculum settings, textbook compilation, etc. with the production technicians and technicians of production enterprises. Operating area managers and field operators conduct interviews, discussions, questionnaires and so on to jointly study the personnel training program.

### **4.2 Highlighting Industry Characteristics and Adjusting Teaching Course System**

If there is no suitable curriculum system and main courses for the development direction of coal-bed methane in safety engineering specialty, the quality of personnel training cannot be guaranteed. The Institute will carry out professional teacher talks, student talks, enterprise technical personnel talks, through which the preliminary formulation of personnel training programs and curriculum standards.

Professor-level senior engineers and technical experts are invited to establish professional direction development and construction committees, examine and approve personnel training programs, curriculum system settings, experimental training base construction, etc., design practical training projects with strong operability, compile operational standards and regulations for practical training, design teaching programs, compile teaching materials and syllabuses.

### **4.3 Teaching Team Building**

#### **(1) Training of Professional Leaders**

According to the training and management system of professional leaders, a technical expert of coal enterprises was hired as part-time professional leaders. At the same time, we should cultivate the leader of the discipline direction specially by ourselves, and make them grow rapidly through the training of domestic and foreign industries and the training of enterprises, so that the leader of the specialty direction can not only grasp the direction of the discipline and specialty development, but also grasp the direction of the industry and occupation development, and form a regional industry leading team with strong practical ability.

#### **(2) Construction of backbone teachers and high-quality full-time teachers**

During the period of professional direction construction and development, we should train two professional innovation leaders, six school young backbone teachers and two enterprise backbone practical training teachers. The school young backbone teachers need to go deep into the coal mine frontline for 6-10 months to realize the integration of knowledge and practice. We should increase the participation of professional teachers in the annual Conference and professional seminars of coal

bed methane mining, and bring the most advanced knowledge to the classroom and to the teaching frontline.

Selection and training of three young and middle-aged backbone teachers, to participate in engineering practice in enterprises, and through the industry's top universities to learn, as well as coal enterprises frontline practice and other ways to enhance professional theoretical level and practical skills.

#### **4.4 Construction of Training bases Inside and Outside the University**

##### **(1) Construction of Productive and Simulated Training Base in School**

The basis of the construction of training base is to train students' professional ability and practical skills, strengthen the construction of hardware and software, and enhance the cultivation of students' skills and cultural connotation.

Specific training equipment should come from production practice, can represent the industry technology application and future development trend, resolutely curb the use of backward equipment in teaching.

##### **(2) Construction of off-campus Practice Training Base**

The construction of off-campus training base is an important part of the construction and development of school specialty. It is an important means to achieve the goal of talent training, improve students' practical skills and improve the quality of talent training. It plays an important role in improving students' innovation ability, entrepreneurial thinking and application skills. The construction of off-campus training base is based on the principle of mutual development, complementary needs, benefit from each other and sharing responsibilities between the school and enterprise. The off-campus training base should have more advanced production equipment and facilities, and can meet the needs of students' on-site practice and training teaching. Engineering technicians in off-campus training bases should be skilled enough to independently guide students' practice.

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