Exploration and Research on the Management of Laboratory Safety in Colleges and Universities under the New Situation

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Abstract: Under the new situation, laboratory safety is facing many problems, such as wide coverage, unscientific management system, unsound responsibility system, insufficient implementation of safety system, insufficient safety investment, and so on. Regarding how to do a good job in laboratory safety management under the new situation, the author analyzes from strengthening the system construction and implementation, improving the responsibility system and performing safety inspections, hoping to provide a reference for the laboratory safety management of other colleges and universities.

1. Introduction

Laboratory is an important element for the teaching and scientific research of colleges and universities, and the cultivation of application-oriented talents puts forward higher requirements on the laboratories Application-oriented talents should be equipped with a theoretical foundation and good practical skills. Therefore, colleges and universities need to increase their investment in their laboratories to ensure the quality of experimental teaching. However, the investment and management of laboratory safety have not received enough attention. In recent years, laboratory safety accidents have occurred frequently, causing great threats to the lives of teachers and students. In response to accidents of such kind, colleges and universities must attach great importance to them and analyze them deeply, so as to improve related management mechanism and responsibility system, standardize laboratory safety management and ensure the safety of teachers and students.

2. Management of Laboratory Safety

2.1 Unscientific Management System

Because many departments and disciplines are involved, laboratory safety management in colleges and universities has become a complex and difficult task. Relevant information shows that the laboratories in domestic colleges and universities are often collaboratively managed by the Dean's Office, Equipment Department, Security Office, Experimental Center, Assets Office and other departments. Each department generally manages a part of the work independently, and there is no department dedicated to the construction and safety of the laboratory, which leads to the scattered laboratory management. The ambiguity of the main body of management leads to the emergence of blind spots of responsibility and the mutual prevarication of responsibility among various departments. Once an experimental safety problem occurs, coordination and communication are cumbersome and it is difficult to deal with safety problems in a timely and effective manner.

2.2 Unsound Responsibility System

At present, most colleges and universities implement a three-level management responsibility system, that is, the school, the secondary colleges and the laboratories sign a safety responsibility commitment letter level by level, clarifying the laboratory administrators and the responsible persons for laboratory safety. However, signing a commitment is often just a form, and relevant departments and personnel do not take specific actions in actual safety management. In addition, the school's investment in laboratory safety is obviously insufficient. Laboratory rooms are tight; it is

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crowed indoors; the escape way is blocked, fire-fighting facilities are insufficient, and environmental protection facilities cannot meet the requirements [1].

2.3 Insufficient Implementation of the Safety Management System

In recent years, laboratory accidents in colleges and universities have made the education authorities and schools pay attention to laboratory safety. Colleges and universities have established related management systems for laboratory safety, but they are not ideal in terms of content, quantity, coverage and operability. In particular, there are some serious problems in the implementation of the systems. The laboratory-related management system cannot be interrelated and integrated with the school's personnel appraisal system, professional title promotion and other systems, making the system lose its restraint and exist in isolation.

2.4 Wrong Security Concept and Weak Security Awareness

There is an erroneous safety concept in many colleges and universities that “it is safe if there is no accident”. No accident does not mean that there will be no accident, and it does not mean that there is no safety hazard. According to the analysis of laboratory accidents at home and abroad, most accidents are caused by people's weak awareness of safety awareness. Many accidents were not caused by facilities and equipment, but by insufficient attention of operators to safety, irregular operations, failure to strictly follow operating procedures or failure to take effective protective measures. In reality, the relevant laboratory system is just a description on the wall and safety education is a mere formality, laying hidden dangers for accidents.

2.5 Insufficient Laboratory Construction and Insufficient Investment in Safety Management

At present, the construction of college laboratories is arbitrary. Rich majors, those with competition projects, those that easily produce experimental results and those whose person in charge can express urgent requirement are generally easy to have their own laboratories. Laboratory construction lacks a unified and systematic planning and overall layout. Similar laboratories are often distributed on different floors of a building, which brings problems for management and safety. In addition, many colleges and universities invest a little in laboratory safety and fail to configure and update safety facilities.

2.6 Unsound Laboratory Management Team

Colleges and universities generally attach importance to the introduction and training of high-level talents, but often ignore the personnel provision of laboratory technicians and management. Many laboratory technicians and laboratory managers are part-timers. They know the basic usage of the equipment, but they did not receive professional training on equipment maintenance, which easily leads to the loss of equipment and the shortened service life. Due to the flow of personnel and the lack of emphasis on the echelon training of experimental technicians, a lot of equipment is unused, which causes great waste.

3. Measures for Laboratory Safety Management

3.1 Strengthening System Construction and Highlighting System Implementation

A perfect system is the fundamental basis of laboratory safety management. The regulations of laboratory safety management in colleges and universities should be formulated by a special management agency and implemented after approval. The laboratory safety management regulations are the “fundamental law” in laboratory safety management, which should include related responsibility systems like the detailed rules for the implementation of laboratory safety management and the relevant systems of the laboratory safety management. Establishment of these systems should be developed based on current national security situation, the laboratory safety management requirements of colleges and universities. Safety management methods need to include the purpose of formulating the methods, management institutions and personnel, management responsibilities, safety management requirements for the whole school, and emergency plans for all

the laboratories of the school [2]. The establishment of a laboratory safety management responsibility system [3] can help to clarify the persons responsible for safety management at all levels. According to the principles “the person in charge of the laboratory shall bear the responsibility” and “the person who uses the experimental equipment shall be responsible” [4], the responsibility is assigned to the safety management personnel at all levels.

3.2 Sorting out the Management System and Improving the Responsibility System

The reform of the management system is the key to straightening out the responsibilities of laboratory safety management, and it must be based on the principle that the department in charge of the business must manage safety issues. It is necessary to set up laboratory management agencies at all levels to be responsible for the demonstration of laboratory construction, the approval and purchase of consumables, laboratory safety inspections, laboratory teaching management, and reporting of laboratory-related information. For affairs about laboratory safety, a laboratory safety leadership group led by school-level leaders should be established. At the same time, each secondary unit must establish a laboratory safety team with the dean (department leader) as the team leader, and establish a professional management organization to establish a safety management system that conforms to the unit according to the characteristics of the discipline.

3.3 Strengthening Safety Education and Improving Safety Awareness

Colleges and universities in the United States have implemented rigid laboratory safety education access systems; they set up various safety education courses for different types of personnel, and take the safety assessment as the first condition for entering the laboratory [5]. Colleges and universities should establish a laboratory safety access system, restrict people through the system and strengthen the implementation of the system. According to the laboratory safety inspection items list of the Ministry of Education of the People's Republic of China, colleges and universities are required to introduce laboratory safety training and examination systems, and they should strengthen the training of safety knowledge through this system as required. In addition, various forms of publicity and education activities (knowledge competitions about laboratory safety, safety accident exhibitions, photo exhibitions, etc.) should be organized to continuously increase the safety awareness of teachers and students.

3.4 Performing Actual Safety Inspections to Eliminate Potential Safety Hazards

Safety inspection is an important means to discover hidden safety hazards and eliminate safety accidents in advance [6]. Colleges and universities should establish a multi-level and all-round laboratory safety inspection mechanism, so as to reduce the probability of laboratory safety accidents. Laboratory safety inspections should be carried out by combining school supervision and inspection with self-inspection of various units, combining general inspection with special inspection, and combining routine inspection and regular inspection. The main forms mainly include general inspection, professional inspection, regular inspection and random inspection, etc. After the safety hazard rectification is completed, the same hidden hazard location should be photographed and feed backed to ensure that the rectification of the hazard is implemented in place and thereby avoid the formalism of safety inspection [7].

3.5 Building System Planning and Increasing Safety Investment

For colleges and universities, the construction of laboratories cannot blindly follow the construction requirements of secondary colleges and departments. It is necessary to strengthen unified planning and demonstration, and scientifically and rationally set up the site, funds, equipment, teachers and other resources of each discipline laboratory according to the requirements of discipline development and the characteristics of the school. In terms of safety investment of a school, it is necessary to increase relevant safety supporting facilities according to the situation of hazardous chemicals of the school. It is necessary to continuously improve the level of high-tech protection through the construction of an information platform, so as to standardize and informatize the safety management of the laboratories. In addition, there is a need to strengthen the training of

laboratory technicians. It is necessary to increase investment and establish projects related to safety management, fully mobilize the enthusiasm and initiative of laboratory technicians, and improve their level and ability of safety management.

4. Conclusion

The management about laboratory safety involves a wide range of issues and a large number of personnel, which is related to the stable development of society and universities. With the progress of the times and the development of society, the new safety situation also puts forward higher requirements in this regard. Colleges and universities should establish an effective laboratory safety management system based on their own reality. It is necessary to implement safety management responsibilities level by level and establish a comprehensive and multi-level safety inspection mechanism. Only by thoroughly investigating potential safety hazards and improving the level of safety management can schools guarantee the safety of teachers and students, the stability of teaching order and their smooth development.

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