

# Discussion on Instrument and Equipment Management in Testing Laboratory

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**Abstract:** *The experimental instrument is mainly used for direct detection or auxiliary detection of samples, which is very important to the measurement results of samples. The ultimate purpose of laboratory instrument management is to ensure the effective operation of laboratory management system, strengthen the management level of experimental instruments, improve the ability of experimental instrument management personnel, in the whole laboratory operation process has a decisive role; The laboratory should establish and improve the management process and rules and regulations of experimental instruments to ensure the effectiveness of instruments and provide accurate and reliable test data for customers.*

**Keywords:** testing laboratory; Instruments and equipment; Management measure.

## 1. PROBLEMS EXISTING IN THE MANAGEMENT OF LABORATORY INSTRUMENTS AND EQUIPMENT

### 1.1 The management system of instruments and equipment is not perfect

Instruments and equipment should have corresponding use and management system, otherwise the use and management personnel have no rules to follow to misuse the instruments, easy to cause damage to the instruments; With the development of society, the update of scientific and technological information, and the continuous update of advanced equipment, the management and use personnel are not trained in time and do not acquire new knowledge and skills, mainly because the management system is not perfect [1]. First, the management system of instruments and equipment is not established at all, and the use and maintenance of instruments and equipment are not standardized, binding and responsible; Second, although the establishment of relevant management system, but with the update of instruments and equipment, the management system is not updated in time; Third, although the management system has been updated in time, it has no practical application. It is only on paper. The updated system is in vain and has not been implemented.

### 1.2 There are problems in the completeness rate of laboratory instruments and equipment

Due to the neglect of the local education system, the elimination rate of laboratory equipment is very high in some schools even if the laboratory has a certain amount of teaching AIDS. Due to the remote area, the laboratory equipment used has been aging for many years, so the performance of the equipment cannot reach the stable standard, or the equipment cannot participate in teaching and use due to the aging quality problems, which brings difficulties for the construction of school laboratories [2].

### 1.3 Laboratory safety awareness is not strong

- (1) In the process of experiment, only pay attention to the process of experiment, do not pay attention to safety issues;
- (2) Unclear division of laboratory responsibilities and backward management mode;
- (3) The management of dangerous goods is not strict and there is a lack of protective measures;
- (4) Lack of daily maintenance of instruments, facilities and equipment;
- (5) The use and maintenance records of instruments and equipment are incomplete;
- (6) Due to the lack of professional knowledge of instrument administrators, they cannot conduct timely and regular inspections, affecting experimental operation and use [3].

## 2. LOW UTILIZATION RATE OF INSTRUMENTS AND EQUIPMENT

The more the state attaches importance to education, the more funds are invested. In the purchase of laboratory instruments and equipment is more random, as long as the demand is raised, the purchase is carried out, and the specific value and use efficiency of laboratory instruments and equipment are not attached importance; Laboratory instruments and equipment are heavy purchase light management, after the purchase of instruments and equipment directly put into use, without training, use by experience; Late use of instruments and equipment did not pay attention to the management and maintenance work, laboratory

instruments and equipment after a long time to use the internal damage; If not maintained in time, it is easy to break down and greatly shorten the service life of instruments and equipment [1]. Some laboratories do not calculate the cost of equipment management, there is no economic responsibility, who buys who uses, so that everyone is competing for resources, personal instruments special management, seriously reduce the utilization rate of instruments and equipment; Some laboratories, due to changes in experimental management or scientific research personnel, will buy instruments and equipment for stacking idle, do not use for many years, until the final asset scrap.

Laboratory instruments and equipment quality management mode is backward, no comprehensive management system has been established, some small laboratories are not even equipped with special managers, only by the operator to maintain and manage the instrument, the lack of daily maintenance of experimental equipment; The laboratory has a large number of instruments and equipment. Although the equipment that may be used in each experiment is limited, other equipment also needs regular maintenance and management [2]. In the absence of comprehensive management means, the aging problem of many equipment has been too serious, but they have not been scrapped and replaced with new equipment, which will affect the normal conduct of the experiment when needed.

### **3. TESTING LABORATORY EQUIPMENT MANAGEMENT COUNTERMEASURES**

#### **3.1 Complete equipment technical files**

Laboratory accreditation criteria in the clear requirements of the laboratory should establish a sound instrument and equipment technical files, files should include equipment file table, contracts, instructions, acceptance and equipment calibration, maintenance, verification and other information; On the basis of building the instrument files, it is necessary to fully manage and make good use of the equipment files, and completely record the calibration, maintenance and verification of each instrument and equipment, especially the failure and maintenance information of the instrument and equipment; By establishing and improving instrument and equipment files, the laboratory can provide detailed technical data such as the operation, maintenance, troubleshooting, damage and causes of instruments and equipment to ensure that the data of laboratory instruments and equipment can be traced; And through detailed technical data, targeted organization to carry out technical training, so that detection personnel understand the equipment operation and past history, to avoid similar failures again, or when similar failures occur, can provide effective technical reference; Good use of the technical archives of instruments and equipment can provide technical data for evaluating the conditions of instruments and equipment and making effective improvement plans, so as to ensure the completeness rate of instruments and equipment and improve the use efficiency [3].

#### **3.2 Installation and acceptance**

After the arrival of measuring instruments, the laboratory should organize relevant technical personnel and equipment management personnel to unpack and accept them together. For large and valuable instruments and equipment, suppliers should be informed to participate in the acceptance and check the completeness and integrity of instruments, accessories and materials according to the equipment supply contract or packing list. If any problem is found in the unpacking inspection, the supplier shall be informed to solve it immediately. If no error is found after unpacking, technical personnel, custodians of instruments and equipment and suppliers shall be organized for installation and commissioning according to the contract requirements [1]; Before installation, ensure that environmental factors such as temperature, humidity, vibration and battery interference at the installation site meet the requirements for instrument operation and use; During installation, collect and save installation process records and related documents in time; After the installation is completed, the laboratory shall check and accept the measuring instruments, focusing on confirming that the functions, operation technical indicators, safety performance and reliability of the instruments conform to the contract. For large precision instruments, the third party can be accepted if necessary; After all indicators are accepted, fill in the acceptance report.

#### **3.3 Pay attention to the purchase of instruments and equipment**

The purchase of instruments and equipment involves the development of purchase plan, feasibility demonstration, bidding, etc.; From the technical point of view, the laboratory should clarify the function and operation index of the instrument before purchasing, and require the instrument supplier to provide the corresponding documents. Including functional indicators, operating indicators, environmental impact indicators, noise, electrical system and control functions, safety protection indicators, key parts of the material, and equipment and related public facilities interface relationship, structure and appearance, computer system, laboratory environment and other indicators; After confirming that the instrument supplier can meet the needs of laboratory procurement equipment, the corresponding procurement will be carried out; Because the laboratory has different scientific research or experiment needs, so the customization of instruments and equipment is gradually popular; To customize non-standard customized instruments to meet specific functions from suppliers. On the basis of checking the routine functions and operation indicators of instruments, focus on confirming whether the functions and operation indicators of customized parts meet the intended purposes; When the laboratory has the ability to make homemade equipment according to its own needs, the laboratory should refer to similar instrument standards, verify the quality requirements, technical requirements and applicability requirements of the equipment according to the function and operation indicators of the instrument [2].

### 3.4 Improve the use efficiency of equipment

Colleges and universities should scientifically arrange the allocation of laboratory resources, rationally plan the purchase of laboratory instruments and equipment, and report the purchase plan of laboratory instruments and equipment management and department to the university. The instrument and equipment department of the university shall, according to the development status of the university, the actual demand of teaching and scientific research, financial status and other factors, After a comprehensive analysis and discussion on the overall distribution, demand, sharing and use benefits of instruments and equipment with relevant experts inside and outside the university, the decision on whether to initiate project procurement will be made. The purchased instruments and equipment should be shared, and the instrument sharing platform should be established. After completing the warehousing procedures in accordance with the relevant regulations of state-owned assets management, the list of relevant instruments and equipment and related parameter functions should be added to the instrument sharing platform at the same time to implement the sharing of instruments and equipment in the whole school, so as to ensure that the purchased instruments and equipment can be fully utilized and to eliminate the problems of vacant and idle instruments and equipment. Avoid the phenomenon of special management after the purchase of instruments, resulting in unnecessary waste of resources [3].

### 3.5 Enhance the awareness of quality management of experimental instruments

Laboratory managers and operators should constantly summarize, and regularly participate in technical training, improve the level of inspection, and constantly improve themselves; At the same time, every member of the laboratory should have a high sense of responsibility. In the quality management work, they should devote themselves wholeheartedly to the problems and management of experimental equipment as an important work. Only by fundamentally strengthening our awareness of quality management can we ensure that product inspection can be completed accurately and smoothly, so as to ensure that products meet the requirements and ensure the accuracy and reliability of inspection [1].

### 3.6 Strengthen personnel training

Personnel's comprehensive quality and technical ability directly determine the use and management of instruments and equipment as well as the accuracy of test data. The key is to improve the comprehensive quality, cultivate the sense of responsibility and improve the effectiveness of technical training. Laboratory operators must go through strict training, pass the examination and take up the post with certificates [2]. Instruments and equipment, especially large instruments and precision instruments, should be used, managed and maintained by special personnel. The personnel must master the manual and various technical information and data content brought with the instruments, and must operate the instruments and equipment in strict accordance with the laboratory specifications to prevent the failure of the instruments due to misoperation.

### 3.7 Strengthen the construction of experimental teachers

In the annual recruitment of teachers, select a number of excellent experimental teachers, enrich the schools to go; Strengthen the participation of experimental teachers in all kinds of national, provincial and state training activities, and do school-based training after teachers return to school; Education authorities hold more activities such as high-quality experimental course evaluation competition and demonstration experimental operation evaluation competition to enrich teachers' theoretical knowledge and cultivate their hands-on ability [3].

## 4. CONCLUSION

In the process of university laboratory equipment management, it is necessary to reasonably purchase and share instruments and equipment according to the principle of economy and practicality, form corresponding management contents according to the daily equipment management needs, build scientific laboratory equipment management system, enhance the professional level of personnel, and truly improve the quality of university laboratory equipment management. It provides strong guarantee for teachers and students to carry out teaching and scientific research smoothly, and promotes the improvement of teaching quality and scientific research level.

## REFERENCES

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