

Discussion on Management Strategy of Large Precision Equipment in Colleges and University

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Abstract

Colleges and universities are the main positions for personnel training and scientific research, and large precision equipment is the necessary condition for training high-quality personnel and achieving significant scientific research results. In recent years, along with the country enlarging to the technical innovation support, the scientific research project is becoming more and more, along with purchasing the big fine equipment also gradually to increase, but the university big fine equipment management universal existence management system is not perfect, the opening use factor is low. There is still a lot of room for improvement in the use of efficiency. This paper focuses on the current situation and existing problems of the large precision equipment in Southwest Petroleum University, and puts forward how to improve the management system and working mechanism to improve the use efficiency of the large precision equipment, only in this way can we provide more support for scientific research.

Keywords

Large Precision Equipment, Management System, Equipment Open Sharing

1. Introduction

Colleges and universities are the main positions for personnel training and scientific research, and large-scale instruments and equipment are the necessary conditions for training high-quality personnel, achieving significant scientific research results, promoting scientific and technological development and innovation, as well as an important symbol of the strength and scientific research level of colleges and universities.

In recent years, with the continuous investment of the state in scientific research projects, the continuous increase of large-scale instruments has played a vital role

in personnel training and major scientific research achievements (Ministry of Education, 2012). At present, the management of large-scale precision equipment in many colleges and universities is chaotic, the open utilization rate is low, and the use efficiency of large-scale instruments and equipment has not been brought into full play (Yin & Liu, 2008). Therefore, how to manage and use large-scale precision equipment well and improve the intact rate? Giving full play to its role and improving the efficiency of its use are an important issue for school leaders at all levels, professional and technical personnel, and managers.

2. Current Situation and Existing Problems of Large and Fine Equipment in Southwest Petroleum University

Southwest Petroleum University (SWPU), founded in 1958, is the second undergraduate petroleum university in China. It is a teaching and research university jointly established by the central and local governments and mainly managed by the People's Government of Sichuan Province. After more than 60 years of construction and development, the school has now become a multi-disciplinary university with petroleum and natural gas and its supporting disciplines as its characteristics and advantages, with engineering as its main subject, and coordinated development of science, engineering, management, economics, literature, law and education. In recent years, with the construction of double first-class disciplines, and the continuous investment of special funds such as national key laboratories and Zhongdi co-construction, the fixed assets of the school have been increasing. The resource conditions of scientific instruments and equipment have been greatly improved. Up to now, the use area of various laboratories in the university has reached more than 90,000 square meters, and there are 36,101 pieces of teaching and scientific research instruments and equipment, with a total value of 735 million yuan, including 251 pieces of large precision equipment with a value of more than 400,000 yuan, with a value of about 276 million yuan. These instruments and equipment have laid a foundation for the school's personnel training, professional construction and discipline development, and provided hardware guarantee. However, at present, the use efficiency of this large precision equipment is still low. Among them, there are 68 sets of large precision equipment with less than 400 hours of actual use per year, and some of them are only open to the interior of the department. There is a serious shortage of equipment maintenance funds, with an average annual cost of about 3 million yuan, resulting in some large precision equipment can not be effectively repaired and maintained for a long time; The full-time laboratory equipment management personnel are not enough, the total number of the school is less than 30, and the use of environmental conditions is poor.

3. Strengthen Management and Strictly Enforce Various Management Measures

With the characteristics of advanced technology, high efficiency and high value,

large and fine equipment occupies a very high position and a considerable proportion in the instrument and equipment, and plays a very obvious role. Stricter and more scientific management methods and use measures should be formulated from all aspects. It can implement a “one-stop” management system from the principal in charge, the competent department, the department, the center, the laboratory to the management and use personnel. Strengthen the macro-management of the layout, funds and use efficiency of the school’s large and fine equipment. For this purpose, the university has also specially formulated the Measures for the Management of Large-scale Precision Instruments and Equipment of Southwest Petroleum University, which has strict regulations on the application for purchase, unpacking and acceptance, installation and commissioning, management and use, maintenance and improvement, application for scrapping and other links of large-scale precision equipment, and has played a greater role in ensuring the normal operation and use of large-scale precision equipment and giving full play to its benefits.

3.1. Strict Application and Purchase Procedures and Approval Procedures

To apply for the purchase of large and fine equipment, a feasibility demonstration report must be submitted, and the necessity of purchase and the use efficiency should be demonstrated by budget. At the same time, the grade, model, specification and technical indicators should be reasonable, neither too high nor too low, otherwise it will cause waste of funds. The purchase demand can be put forward by the experimental center of the department, and the products of different models from domestic and foreign manufacturers can be fully investigated, and their advantages and disadvantages can be pointed out in different categories. After the expert demonstration in the department, the necessity of investment can be demonstrated at the university level. At the same time, “three implementations” should be carried out, namely, the implementation of purchase funds, management personnel and supporting conditions. When the above conditions are fulfilled, fill in the “Southwest Petroleum University Large-scale Precision Instrument and Equipment Purchase Investment Demonstration Form”, which shall be signed and approved by the person in charge of the unit and the fund management department, reviewed and approved by the Laboratory and Equipment Management Department, and submitted to the competent school leaders for approval. In the past four years, Southwest Petroleum University has organized 12 expert demonstration meetings, involving 36 sets of equipment and more than 76 million yuan of funds. See **Table 1** for details.

3.2. Strict Acceptance of Warehousing and Requisition Procedures

After the arrival of the large and fine equipment, a special acceptance team (5 - 7 persons) composed of the applicant, the laboratory equipment management office,

Table 1. Number of equipment demonstration meetings and investment.

Year	Number of annual demonstration meetings	Number of sets	Amount of funds (ten thousand yuan)
2018	3	12	1300
2019	4	10	2400
2020	3	8	2500
2021	2	6	1400

the equipment user and relevant experts shall be established to formulate the acceptance plan and various acceptance preparations. First, check the outer packing, register one by one according to the packing list, and verify in turn according to the contract list; after installation, test according to the technical indicators, compare the acceptance team with the technical indicators agreed in the contract one by one, and fill in the “Southwest University Acceptance Registration Form” when all meet the contract requirements. After the acceptance is qualified, the experiment and equipment management department shall give the number and establish the account card. Relevant data and acceptance records shall be submitted to the Experiment and Equipment Department for filing, equipment data files shall be established, and the qualified equipment shall be handed over to the equipment manager. If it is not qualified, relevant procedures such as claim and return of goods shall be handled in time.

3.3. Strict Use and Maintenance Management

Establish and improve the management mechanism of laboratory scientific research equipment, and strengthen the management and system of large-scale instruments and equipment. To formulate the Benefit Assessment System for the Use and Management of Large-scale Instruments and Equipment of Southwest Petroleum University, the Management System for the Opening and Sharing of Large-scale Instruments and Equipment of Southwest Petroleum University, the Operation, Maintenance and Repair System for Large-scale Instruments and Equipment of Southwestern Petroleum University, and the Post Responsibility System for Large-scale Instruments and Equipment of Southwestern Petroleum University. “Southwest Petroleum University Large-scale Instrument and Equipment Use Archives Management System” and other systems, multi-link control, and continuously improve the efficiency of equipment use. Large and fine equipment can be managed by special personnel and stored at fixed points. The management personnel should have considerable professional knowledge and skills, and be responsible for the registration of use, fault inspection, cause analysis and treatment. Each set of large precision equipment is also equipped with a special use register and fault register, which record the date of use, the unit and purpose of the user, as well as the time and cause of the fault, report regularly, conduct strict quantitative assessment, implement responsibilities, and have

evidence to check.

3.4. Strict Downshift and Scrapping Management

Due to the decline of technical indicators and performance, and the long use time, large and fine equipment is not suitable for the management of designated personnel of large and fine equipment, the user unit may apply and fill in the "Application Form for Downgrading large and fine Equipment of Southwest Petroleum University", which shall be filled in by the management personnel, confirmed by the person in charge of the laboratory and department, and confirmed by the person in charge. After the laboratory and equipment management office organizes relevant experts to appraise and report to the principal in charge for approval, the management of large precision equipment may not be carried out. For those who meet the scrapping conditions, they can apply for scrapping and fill in the scrapping application form. The application for scrapping shall be submitted to the Laboratory and Equipment Division of the University for review after the reasons are explained by the management and use personnel and approved by the technical personnel and responsible persons of the laboratory and department. After no objection is found in the review, the application can be scrapped with the signature of the leader in charge of the University.

3.5. Other Improvement Measures

The reason why many colleges and universities have confused equipment management, low use effect and insufficient equipment maintenance fee is that besides strengthening management and strengthening system construction, we can also start with innovating working mechanism and system.

1) Strengthen ideological education and vocational education, implement the post responsibility system, reward and punish clearly, put an end to man-made accidents, prevent damage, make good use of limited funds, and invest in a planned, step-by-step and focused manner.

2) Strengthen internal cooperation and external service (Wang & Hua, 2011), establish regional large precision equipment cooperation and sharing network, share resources, and make full use of existing equipment. To strictly control the large and precise equipment of larger systems and avoid repeated purchases, the units with existing equipment should strengthen communication with brother units, put some basic profiles and functional parameters of instruments on the network, and improve the sharing rate of equipment (Chen, Wen, & Zhou, 2010).

3) The implementation of paid services. Schools can extract a certain proportion of funds according to scientific research projects or the need to purchase new equipment, and establish a large fine equipment maintenance fund for the maintenance of large fine equipment to ensure the integrity and normal use of existing equipment (Liang, Yang, & Wu, 2012). In terms of the proportion of fees, the implementation of in-school and out-of-school is different. For some

young teachers with few scientific research projects, after verification by the relevant departments of the school, free services can be implemented.

4) Strict assessment. Units and individuals with good management and high efficiency in use shall be rewarded. For individuals, it can be used as a condition for performance evaluation and promotion. For units, it can be used as a basis for school investment to allocate equipment fees and maintenance fees. It can strengthen the assessment from the aspects of daily management of equipment assets (including: equipment accounts, equipment inventory, equipment scrap and disposal), idle equipment management, operation and maintenance of equipment information system, charge management, equipment maintenance and repair.

4. Conclusion

Although in recent years, with the rapid growth of scientific research funds, the school's large precision equipment has increased rapidly, but there are still some problems in the management of large precision equipment, only from the aspects of management system and working mechanism, make each management link standardized, in order to manage the large precision equipment well, in order to maximize the benefits of the big precision equipment

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

- Chen, J. D., Wen, G. H., & Zhou, H. T. (2010). System Construction and Practice of Valuable Instrument and Equipment Sharing Mechanism. *Experimental Technology and Management*, 27, 32-35.
- Liang, G. H., Yang, S. G., & Wu, X. F. (2012). Establishment and Development of Laboratory Open Fund of Tsinghua University. *Experimental Technology and Management*, 29, 188-193.
- Ministry of Education (2012). *Statistical Bulletin on the Development of National Education in 2011*. http://www.gov.cn/gzdt/2012-08/30/content_2213875.htm
- Wang, Y., & Hua, X. (2011). Policy Recommendations to Promote the Management and Sharing of Scientific Instruments in China. *China Science and Technology Forum*, 11, 29-33.
- Yin, L. P., & Liu, Y. H. (2008). Problems and Countermeasures in the Management of Large-Scale Instruments. *Metrology and Testing Technology*, 1, 63-64.