

Standardized methods for quality control of metrological testing processes

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Abstract: With the rapid development of science and technology, the application of standardized detection methods in various industries is more and more common and perfect, including the comprehensive application of industry and machinery, especially in the research of some large-scale production equipment, which has achieved ideal development results. Measurement and testing are related to the safety of equipment parts, and technological development is related to national economic development, which needs to be widely concerned and valued by relevant staff.

1. Introduction

Traditional industrial production and management means have been difficult to meet the needs of modern development, a large number of new equipment to replace traditional machinery continues to be introduced, greatly improve the quality and speed of China's industrial project development. Relevant staff need to fully understand, the basic concept and application measures of relevant measurement and testing technology, clarify its specific application path, and constantly draw from practice to adjust and optimize the application of technology program, so as to help China's industrial development to make a positive contribution.

2. The Connotation of Measurement and Testing

The rapidity, accuracy and comprehensiveness of measurement and testing technology are important factors related to the actual quality and application effect of the tested products, packaged machinery and equipment, etc., and are related to the safety performance, comprehensive quality and market competitiveness of the products, so it is necessary to receive extensive attention and attention from relevant staff. In addition, in the long-term process of modern industry and modern science and technology development, a large number of high-quality testing concepts, testing technology and testing equipment have been created, laying a solid material foundation for meeting the requirements of industrial design, production and development. The testing content in the project is particularly complex and detailed, not only including the evaluation of the overall safety performance and stability performance, but also contains a lot of details to check, such as the accurate measurement of the size of each component of the machine, the measurement and testing not only ensures the safety and

stability of the relevant tested products, but also provides a practical material data support for promoting the transformation of related fields.

3. The Specific Application of Measurement and Testing

3.1 Packaging Inspection

The packaging and inspection of products often require particularly meticulous and flexible work handling to avoid unnecessary work errors, which will affect the safety, stability and market competitiveness of the product as a whole. It can be seen that the product packaging field of related enterprises often has a series of continuous, systematic and large-scale re-inspection and measurement procedures and mechanical equipment, including real-time monitoring of printing quality, and accurate identification of strings and barcodes on product packaging ^[1]. Compared with the previous manual information retrieval, observation, verification and induction technology machines, the national standard significantly improves the timeliness, accuracy and systematization of information identification, screening and processing, which is crucial for greatly improving production efficiency and production quality.

3.2 Product Quality Inspection

Whether the products produced meet the specified design standards and systems, whether they have strong stability and systematic, and whether they meet the requirements of various design rules are the main factors affecting product quality and market competitiveness. It can further improve the work efficiency of the entire production line, and with the application of related technologies in practice more in-depth and systematic, detection technology has also played an important role in more fields.

With the further development of science and technology, detection technology application in related industrial production systems will become more and more in-depth and perfect, and it can be applied more flexibly in practice, and play a positive application value in a limited time. For example, the flexible application of relevant technical standards can accurately observe, measure and verify the geometric parameters and unknown parameters of various parts and products to be tested, and decompose the core technology of product production into specific organizational components, which plays a vital positive role in improving technical defects, improving product performance and adjusting industrial institutions.

4. The Problems of Standardized Methods in the Application of Measurement and Testing

4.1 Hardware Factors

The realization of measurement and detection technology cannot rely on the support of fixed, systematic and sensitive hardware, which requires that the system hardware can have a good application environment and good performance stability, and the lack of any hardware factors will greatly limit the timeliness and accuracy of detection. Specifically, in addition to the environmental stability of the relevant inspection equipment system, it also depends on standard light sources, lens angles of optical systems, static frame grabbers, and self-designed non-working structures ^[2]. In short, improving the stability, clarity, accuracy and flexibility of equipment should be one of the main goals of future related mechanical equipment upgrades.

4.2 Software Factors

In addition to the constraints of hard conditions, the sensitivity of the relevant detection equipment depends on the software system for the timeliness, comprehensiveness and accuracy of image content acquisition. Combined with a large number of references and relevant practical experience, it can be recognized that most of the current testing equipment, there are still certain misunderstandings in the perfection and accuracy of the software, which is particularly detrimental to the further promotion and application of related technologies and the systematic improvement of related product performance, so it is still necessary to complete further discussion and adjustment and optimization in practice.

5. The Application of Standardized Methods in Measurement and Testing

5.1 Standardization of Sending and Receiving Processes

Inspection work design a lot of content, such as in the document, testing standards need inspectors patient and meticulous to ensure detailed investigation, to ensure that there are no problems, in the inspection of the equipment, need to check electrical appliances, lines, parts and even each screw, etc., the specific situation and operation status and other contents to check, these contents must be written on the list and require the relevant person in charge to sign 1. After each inspection, there should be a corresponding inspection report, and once any quality problems occur in the follow-up, the person should be traced. Use some multimedia equipment and Internet technology for data interception and photo preservation, inspectors should carry out multiple training assessments, otherwise cancel their inspection work qualifications, do a good job in data recording and the company's internal management, and record data in detail ^[3].

5.2 Standardization of Verification and Calibration Processes

Strict selection of equipment, to purchase from some well-known big brands, the selection of well-known, good quality equipment can ensure quality. After purchasing the equipment, you should first check whether the equipment is accurate, and test it in all aspects, well-known manufacturers will conduct quality inspection of the equipment before leaving the factory, durability, corrosion resistance are guaranteed, but there may be a slight error, is within the scope of the state. Enterprises should be handed over to the relevant audit departments for sampling and testing after the production of equipment, and only after meeting the standards can they enter the market, and regularly record and track the equipment to ensure normal use.

Inspectors should regularly supervise and accurately record every data and detailed information, so that subsequent problems can be solved in time and the probability of accidents can be reduced. During the inspection process, eliminate any illegal management behavior, refine the inspection standards in accordance with relevant rules and regulations, and use corresponding work standards to restrict the behavior of inspectors. Relevant staff should improve their professional skills, continue to accumulate experience, in the equipment testing process requirements can be strictly in accordance with the standardized process operation, only the staff with a sense of responsibility, can ensure that the testing process does not appear error ². The corresponding units should regularly hold training meetings and exchange meetings, require measurement and testing personnel to conduct in-depth exchanges, learn advanced technology, and understand the importance of ensuring quality in the process of measurement and testing equipment. Enterprises should improve the enthusiasm of staff through various incentive and punishment measures, regularly check the familiarity of various regulations, and try to reflect unqualified equipment to the manufacturer. Do a good job in the

verification of equipment, find problems and deal with them as soon as possible, minimize losses, and cannot be used as long as they are unqualified in the verification process.

5.3 Standardization of Certificate Reporting

The standardized measurement and testing management work is carried out smoothly, and it is necessary to regularly screen and sort out the documents, such as checking whether the content meets the format, whether the relevant information is correct, and understanding the correction date of some documents. Innovate the document management system, the process is complex and cumbersome, there will be contradictions between various departments, in the face of this problem, we must put forward more feasible plans, do a good job in the interaction and communication between management departments, and further implement the specific responsibilities of managers.

Standardized management involves a variety of forms of record content, so it is necessary to clarify the future management direction and development goals through long-term planning, ensure that different types of documents can be fully utilized. Document collection and classification can be better archived using intelligent technology.

The classification and sorting of certificate report management process is the most important part, the use of information technology, such as various office software and cloud computing and other processing methods, document management as the key content, improve its application efficiency. The standardized management of certificate reports is a complex process, which requires the immediate instructions of superior leaders, managers to learn new technologies and concepts, close cooperation between departments, and unified documents to be archived to the management department. Therefore, management needs to be regularly optimized, unnecessary workflows and working mechanisms simplified, so as to reduce the pressure on staff in the management of documents and files³.

6. The Significance of the Application of Standardized Methods in Measurement and Testing

6.1 Improve Accuracy

The application of standardized measurement and testing can quickly analyze and integrate information, analyze abnormal content, and adjust subsequent detection schemes. It is even possible to adjust the management mode of equipment and machinery to achieve module management, for example, in CNC machining to improve the accuracy of data machine tool operation. At present, engineering applications are mainly based on automatic control systems, and highly intelligent methods greatly reduce human errors.

6.2 Reduce Energy Consumption

The traditional metrological inspection process consumes a lot of cost time, and the accuracy of some equipment cannot be guaranteed, which will lead to reduced equipment life if operated under overload. Reasonable adjustment of the operating state of mechanical equipment is conducive to the improvement of economic benefits and the quality of mechanical products, standardized measurement and testing use monitoring methods to analyze the energy consumption of equipment, and formulate the most reasonable application measures to minimize energy consumption. Under the control of standardized measurement and testing, the energy consumption of system operation is improved, and the control equipment system can establish a complete automatic control management system.

6.3 Overall Supervision

The project needs to use a large number of equipment at the same time, the normal operation of the monitoring equipment can understand its status, and the monitoring system has an automatic troubleshooting function. The internal structure of the equipment is very complex, some parts, electronic components failure maintenance is very troublesome, need to have professional operators for systematic inspection, consuming a long time. Standardized measurement and detection of fault sensors and diagnosis system can timely judge the performance and adjust and optimize, such as some auto parts manufacturers application of standardized measurement and detection system, through electronic monitoring and automatic alarm function to evaluate automotive components, obtain relevant data and big data network comparison, so as to ensure the safety of the automobile production process, standardized measurement and detection system can monitor the operation status of the equipment in real time, and adjust the deviation data parameters.

6.4 Improve Detection Efficiency

In the event of any problems in the conveying process, the operator only needs to manually stop and then restore the settings to ensure that the equipment runs automatically. China's current machinery and equipment are basically separated from the traditional operation mode, and fully automated and semi-automated management is the future development direction. Since the application of standardized measurement and testing in mechanical engineering, the probability of major mechanical production accidents in China every year has been greatly reduced.

7. Conclusions

In summary, the introduction and wide application of new concepts, new ideas and new technologies play a vital and positive role in fundamentally improving the innovation of measurement and testing in China, promoting the quality and efficiency of related industrial production in China, and promoting the long-term sustainable development of China's industrial economy. Whether it is in the upgrading of relevant detection technology, or the improvement of related testing content and standards, it is necessary to do more systematic research, practice, reflection and summary, so as to lay a solid foundation for further optimizing the application of related technologies and provide a steady stream of development impetus for economic development.

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