New Changes in Quality Management System Requirements and Suggestions for Organizational Implementation of New Standards

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Abstract. Requirements for Quality Management System (QMS) is not only a quality management standard that must be implemented by equipment contractors, but also an important basis for establishing quality management system and carrying out quality management system certification for organizations undertaking argumentation, development, production, testing, maintenance and service tasks of military equipment and ancillary products. For organizations, the key is to use standards to establish a quality management system that conforms to their own reality, to understand standards and to "localize" the requirements of standards. Through the interpretation of the new contents and changes in the 2017 edition of Quality Management System Requirements, this paper puts forward specific suggestions for the organization and implementation of the new standards, with a view to providing a reference for equipment contractors.

1. Introduction
In order to ensure the quality of components, in the early 1990s, China formulated a series of standards for components, such as the early "seven specialties" (specialist, special plane, special material, special batch, special inspection, special technology, special card or special line). With the improvement of production level, the army's requirement for product quality is getting higher and higher, and the requirement of "seven specialties" is gradually overturning to the national military standard for components. Relevant enterprises must also pass the certification of the national military standard according to the requirement. In 1996, three series of standards of Quality System were issued. In 2001, the standards of Quality Management System Requirements were revised and perfected. In 2009, the standards of Quality Management System Requirements were revised again. The latest version of Quality Management System Requirements was released in May 2017 and formally implemented in July 2017. Enterprise product quality is the most important content of enterprise core competitiveness, and the application of "Quality Management System Requirements" standard can effectively improve the product quality of equipment contracting units. Making full use of the principle of focusing on customers in the standards to meet the current and future needs of customers, and even exceeding the expectations of customers to complete product production, can improve customer satisfaction, make products better adapt to the market, enhance the competitiveness of enterprises in the market, so as to achieve sustainable benefits of enterprises [1]. At the same time, the stringent requirements of the new version of the standard in product sales also provide better suggestions for the follow-up production and service of products.
2. Major changes in the 2017 edition of standards

The standard of Quality Management System Requirements of 2017 edition adds special requirements of equipment quality management system on the basis of the original edition. The body part includes two aspects: GB/T19001-2016 and special parts of equipment quality management. Compared with the old version of the standard, the new version mainly improves in the following aspects.

2.1. Updated Terminology

Compared with the 2009 edition, the number of terms in the 2017 edition has increased significantly, from 84 terms in 10 categories to 138 terms in 13 categories [2]. In addition, some terminology definitions are more standardized and accurate. For example, "product" is extended to "product and service", which adds the content of product tracking and service to users besides the quality of the product itself. Modify "working environment" to "process operation environment", which covers a wider range and is more profound and accurate. Modifying "purchasing products" to "products and services provided from outside" can better reflect the internal and external relationship of the organization and the meaning of the product. At the same time, the new standard realizes the transformation from "form" to "content", reduces redundancy requirements, and is more realistic [3].

2.2. Streamlined Terminology

The eight quality management principles of the original standard are simplified into seven, and the principle of "systematic management method" is decomposed and integrated with other principles. At the same time, some principles have been given new content. For example, the new version changes "full participation" to "full participation", Simplify "continuous improvement" into "improvement". Changing "mutually beneficial relationship with suppliers" to "relationship management" incorporates some of the previous "systematic approach to management"[4]. It is worth noting that seemingly reducing or simplifying the requirements, but in fact reducing or simplifying the "formal" requirements, emphasizing that the organization should implement effective management according to its own actual situation, avoid or reduce the previous rigid terms, identify and determine the needs and requirements for processes, responsibilities, resources, documents and records from its own point of view[5].

2.3. More Strict Control Over Risk

In the original standard, risk awareness or risk thinking has not been explicitly proposed, but reflected in planning and evaluation. In the new standard, each chapter clearly requires measures to deal with risks and opportunities. The new standards put forward new requirements in risk assessment, identification, analysis, evaluation and response, which have a strong role in promoting the effectiveness of quality management system. In addition, the new standards also require organizations to pay attention not only to themselves, but also to the satisfaction of stakeholders, and have the response measures to find opportunities from the organizational development environment, in order to enhance the value of quality management system [6]. It is mentioned in the new standard that the process management method and its application should be strengthened, the requirement of risk management and control should be raised, and the organizational environment management should be increased so as to make the PDCA process in the quality management system compatible with risk identification, risk control, risk management and environmental management, so as to give full play to the advantages of system management and improve the effectiveness and efficiency of organization operation.

2.4. More Standard for the Retention of Written Information

Four aspects of the first part and two aspects of the second part of the body of the new standard clearly put forward the written information that should be maintained, including various documents, procedures, quality manuals and so on. At the same time, the new standards also put forward relevant requirements for written management information. The new standard reduces the mandatory requirements for document details, quantity and presentation, and no longer requires organizations to develop six categories of documents, such as quality manuals [7]. At the same time, the contents of "documents"
and "procedural documents" in the old standard are replaced by "written information" and "records" are also evolved into "retained written information". Maintaining and retaining all kinds of written information provides a strong basis for the quality management process, thus improving the effectiveness of the quality management system.

2.5. More Stringent Requirements for Leadership Management
According to the new standard, the top management should be responsible for the final products and services, and the responsibility can be traced back to life. Top management should be able to obtain timely information on product quality issues, including the final product flow direction, actual application results and so on. The new standard requires top managers to be responsible for the effectiveness of the quality management system, and emphasizes the allocation of power and responsibility through "ensuring the independence of internal quality department authority", "ensuring the integration of the quality management system into the business process of the organization" and "ensuring that customers have timely access to information on the quality of products and services". The new standard clearly points out that top managers are the top administrative leaders of the organization, and top managers should be able to authorize and provide resources within the organization [8]. The top managers of the organization are directly responsible for the effective operation of the management system of the organization.

2.6. Higher Requirements for General Quality Characteristics
The performance of any equipment product includes quality and function characteristics. General quality characteristics include reliability, maintainability, supportability, safety, testability and environmental adaptability of equipment. Operational requirements and operational applications determine the importance of general quality characteristics. If a component fails, it needs to be able to locate the fault quickly, which requires that the equipment has good testability, and at the same time, after the fault is detected, spare parts can be replenished in time, which requires the security of the equipment. In the standard, the contractor should select and set up the content of general quality characteristic evaluation according to the task of evaluation and the level of product composition to ensure that the general quality characteristic of product meets the target requirement [9].

2.7. More Emphasis on Technical State Management
Technical status refers to the functional and physical characteristics of products. It is expressed by baseline. Organizing products and services must meet the required technical status [10]. Technology status management is a management activity in order to ensure that the technology status of the product meets the baseline requirements and meet customer needs in the whole life cycle of the product. Technical status management is also a management activity to ensure that the physical status of the whole product life cycle is consistent with the implementation documents of the product technical status[11]. Documents issued by the State Council and relevant departments regard technology status management as a means of quality management, and clearly require contracting units to establish and improve technology status management system in accordance with the "Quality Management System Requirements" standard, and strictly control the update and change of technology status [12]. The new standard requires that technical status items and baselines be established according to specific products and services, and management plans are drawn up according to technical status management requirements. The technical status of products and services is identified, controlled and audited.

3. Suggestions on Implementing New Standards of Quality Management System

3.1. Strengthening the Basis of Organization Quality Management System Certification

3.1.1. The emphasis and promotion of military industry leadership is the key to the construction and smooth implementation of the quality management system.
80% of the effectiveness of quality management is reflected in the leadership and management, and 20% depends on the executive level. Only when senior leaders fully realize the importance of quality management system in organizational quality management, attach great importance to it ideologically and implement it in action, can the quality management system play an effective role. Top managers control the direction of the enterprise and are the commander-in-chief of all activities. Therefore, only when top managers attach great importance to and lead effectively, and create a good atmosphere for the participation of all, can the edition change be successful. In the process of edition change, under the unified leadership of the top management, carefully plan and organize, clearly define responsibilities, provide resources, put forward requirements and ensure implementation.

3.1.2. The perfection and feasibility of the operation system of the quality management system is an important guarantee for the effective operation of the quality management system.

With the attention of the leadership, it is necessary to establish a quality management system operation system in line with the actual situation of the organization. Organizations can decompose the objectives and requirements of the quality management system layer by layer, establish a monitoring and evaluation mechanism, implement the goal responsibility system, and encourage employees to participate in the operation of the quality management system. Replacement of quality management system is a good opportunity to improve quality management system. In addition to ensuring that the quality management system after replacing meets the new standards and special requirements of aerospace, we should pay attention to comprehensively and systematically analyzing and summarizing the current situation of aerospace quality management system and the physical quality of products, finding out the risks and weak links in system and technology, and aiming at them.

3.1.3. Full participation and continuous training are the key to ensure the effective operation of the quality management system.

Effective operation of quality management system is not only for leaders to realize the importance of implementing standards, but also for all employees to participate in the operation of quality management system. Therefore, continuous training should be given to all employees so that they are clear about their roles and responsibilities in the quality system. Quality management emphasizes training. Only through continuous training to improve the quality and ability of leaders and employees, can we ensure the conscious participation of leaders at all levels and all employees. Therefore, in the process of edition change, the training of new standards should be placed at the top of all work, and under the leadership of management, personnel training of managers at all levels, technical backbone, dispatching system and other different levels should be carried out.

3.2. Continuous Quality Improvement Based on New Standards

3.2.1. Implementing quality management system improvement based on organizational objectives.

Organizational management by objectives is a scientific management method for an organization to mobilize the enthusiasm of employees, achieve self-control through the implementation of individual and group objective responsibility and achieve individual achievement in the process of management centered on quality. One is to set scientifically measurable personal goals to optimize the overall objectives. The second is to adjust the unreasonable part of the target in time in the process of practice and work, that is, to constantly improve the target. Thirdly, we should timely eliminate the completed goals, constantly improve the difficulty of achieving the goals, and stimulate the enthusiasm of employees.

3.2.2. Continuous improvement of quality management system related system documents.

System document is a prescriptive document of organization quality management and an important basis for implementing standards. A set of system documents suitable for oneself is an important guide for organizational quality management. Therefore, in the process of implementing quality management
according to the new standards, system documents, including quality manuals, procedure documents, etc., should be formulated in close connection with the actual situation of the organization's size and personnel quality, and these documents are not invariable after formulation. In the process of implementation, timely updating and improvement should be carried out according to feedback in order to achieve the purpose of continuously improving quality standards.

3.2.3. Create an atmosphere of continuous improvement in management.
In order to ensure the sufficiency, suitability and validity of the quality management system, the management review method is used to evaluate the quality management system according to the time interval planned by the senior managers of the organization. Management review is a continuous quality improvement activity which is participated and sponsored by senior managers of the organization. The participation of senior managers has a strong incentive and demonstration role for the continuous improvement work. In the process of management review, senior managers should find opportunities for continuous improvement of quality according to the relevant procedures and contents stipulated in the new standards, and extend the opportunities to every employee in every position to form an atmosphere of continuous improvement within the organization. At the same time, the staff who deviate from the direction of continuous improvement should be properly pressured to improve the participation of the whole staff in the continuous improvement of quality.

3.3. Achieving Quality Management System Replacement Certification as soon as possible with reference to the new standards
The new edition of "Quality Management System Requirements" standard has been issued. Units that have passed the old edition certification in the past should pass the new edition certification as soon as possible within the three-year transition period, train personnel with the new standard, and formulate and revise the quality management system documents.

3.3.1. Fully understand the important role of quality management system certification.
As an important certification system, quality management system certification has not been fully understood by many people about the specific certification process and role of the system. And there are not a few senior managers who do not know enough about the certification of quality management system. In order to implement the new standard in management, the top managers of the organization should improve their understanding of the quality management system, improve the cognitive level of all employees by organizing the participation of all staff members, make full use of human resources and other resources in the management process, strictly implement the new standard in actual management activities, strictly implement the new standard in management activities, grasp the implementation process and results in real time, and determine and evaluate the risks and risks therein. Opportunities, and through appropriate measures to improve the organization's standardization and standardization level.

3.3.2. Continuously improve the level of organization and management.
Quality management system certification is a complex process. Organizations must improve the management model, implement modern management, and provide guarantee for better implementation of quality management system certification in management. Different organizations should correspond to different certification standards. They should constantly improve their management system. They should monitor possible loopholes in the production process and take timely measures to improve them. In the production process, we should give full play to the role of internal auditors to ensure the quality of products and services. In the process of product sales and after-sales, organizations need to improve their awareness of active service and improve product performance through product tracking and research and service feedback. More investment should also be made in scientific research to ensure the scientific and technological content of products. Secondly, we should introduce professional management talents with relevant experience, strengthen the training of quality management system for
organizational staff, train local talents, strengthen communication with other organizations, and learn from successful experience.

3.3.3. **Strengthen the internal control of the organization.**

Organizing internal control plays an important role in quality management system certification and effective operation. Effective internal control can improve the quality of products and services, enhance brand competitiveness, reduce operational risks, and provide a strong guarantee for the long-term and stable development of the organization. According to the principles of independence, checks and balances, rationality and soundness, the internal control of the organization is supervised from the aspects of organization, production activities and risk control, so as to provide favorable environmental conditions for the certification and operation of the quality management system.

4. **SUMMARIES**

The 2017 edition of Quality Management System Requirements puts forward higher requirements for the organization's quality management system. This paper summarizes the main changes of the new standard from seven aspects. These changes and adjustments make the standards more in line with the current market environment and quality management development requirements, and more conducive to the use of standards by relevant parties, especially equipment manufacturers. The new standards can enable organizations to implement systematic management in combination with the actual application process and methods, thus improving the quality management level of the organization, enhancing the overall risk prevention and control ability of the organization, enhancing the effectiveness of the quality management system audit and certification, and ultimately promoting the benefit of customers and relevant parties. In the new standard, risk priority is determined by risk ranking, so as to take preventive measures and emergency strategies to prevent risks and ensure product quality. In short, the new standard adopts a process-oriented approach, combines PDCA cycle control theory and risk management thinking, which enables organizations to continuously enhance quality management quality to meet customer needs in the process of establishing quality management system and implementing quality management using standards, and ultimately achieve the goal of benefiting all parties.

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