Research on the Civil-Military Integration Logistics Support System of Warships

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Abstract. This paper had researched the construction of the Chinese Navy warship logistics support system, on the basis of drawing lessons from foreign military work experience. It had pointed out that, the institution building of Chinese Navy warship civil-military integration logistics support should be carried out from three aspects: establishing whole life-cycle logistics support mechanism, perfecting market competition mechanism, establishing the joint logistics support mechanism. At the same time, it had suggest that we should pay more attention to improving the research and development (R&D) capability, peacetime and wartime transfer capability and quality management capability of civilian enterprises. So it would to improve the quality and efficiency of Chinese Navy civil-military integration logistics support.

1. Introduction
In recent years, the contradiction between warship logistics support demand and Chinese Navy internal logistics support capability is becoming increasingly prominent, with the extensive service of modern naval warships and onerous combat readiness cruise tasks of their implementing. In this condition, the model of independent logistics support in Chinese Navy, which has been implemented for half century, has been difficult to provide fast, accurate and high-quality logistics support services for batch, high-strength and whole life using warships, either could not meet the needs of easy support and well support [1-2]. Therefore, it has great significance to improve the support capability, reduce the support cost and enhance the operational effectiveness of warships by learning from the successful experiences of foreign military, that was reforming the logistic support system and utilizing the advantages of civil industry department including scientific and technological strength, information resources, human resources and logistics network, which could provide logistics support services for Chinese Navy warships.

On the basis of foreign military experiences, this paper had researched on Chinese Navy warship logistics support system construction, and put forward suggestions on institutional-building and capacity-building of the civil-military integration logistics support, which had the great significant for both improving the logistics support capacity and reducing the logistics support cost of warship.

2. The current situation of foreign army civil-military integration logistics support
The concept of civil-military integration logistics support was first proposed by the United States. In 1994, the U.S. Congressional Bureau of Technology Assessment had issued the ‘Potential Assessment
of Civil-Military Integration’, which calls for the combination of defense industry and civil industry, to form a unified national science and technology innovation system [3]. The so-called ‘civil-military integration logistics support’ refers to making full use of professional military and civilian support resources under the unified planning and guidance of the state, for enable the weapon to maintain or restore to a good operational readiness to ensure the military’s requirements [4].

After more than 20 years development, the U.S. had established a relatively perfect civil-military integration defense science, technology and industry system. According to the research report of the U.S. Congress, the civil-military integration logistics support had saved at least 30 billion US dollars annually for the Ministry of Defense, equivalent to more than 20% of the weapon acquisition funds [5].

At present, the U.S. civil-military integration logistics support has following features:

1) Introducing civil technology to supply support. The U.S. military is good at using mature and advanced civilian technology to provide supply support for weapons. Such as the signal processor of F-35 joint fighter had been provided by Mercury Systems Company, and the defense airborne reconnaissance antenna was provided by Harris Company. It had great improved the scientific and technological level of U.S. weapons by utilizing advanced technological method in the civilian field.

2) Introducing commercial company to armament logistics. In the logistics transportation support field, the U.S. Army had introduced Wal-Mart, Actuate Corporation and other civilian retail giants to participate in it actively. By utilizing the visual logistics transportation support resources of professional logistics companies, the spare parts, maintenance tools and other armament materials can be transported to the global battlefields accurately and rapidly, and the benefits of weapon logistics support can be maximized.

3) Introducing design and construction units to provide weapon maintenance support. The U.S. Army had introduced design and construction units to participate in weapon maintenance support actively. For example, in the Iraq war, the maintenance support tasks of U.S. Army's communication system, armed helicopters and ground weapon system were all accomplished by the original design and construction units, as shown in figure 1. It had’t only improved the efficiency of weapon maintenance support, but also reduced the pressure of rush repair by the military internal logistics support force greatly.

![Figure 1. The rush repairment of Tank by U.S. construction units](image)

In order to change the deformity of military development in the former Soviet Union era, Russia had promulgated a series of laws and documents, such as the ‘Law on the Conversion of National Defense Industrial Army to Civil Affairs’, aiming at promoting the level of civil-military integration logistics support, and promoting cooperation between military enterprises and civilian enterprises, military enterprises and foreign enterprises vigorously.

France, Germany, Italy and others were committed to establishing the cooperation framework of EU defense science and technology integration support, for carrying out joint civilian-military technology development, extending from civilian technical cooperation to military technical cooperation.

Japan had adopted the means such as developing civilian military industry and establishing civil-military integration support service company to promote the development of civil-military dual-use
technology and industry, so that to advance the process of civil-military integration support strategy for the Japan Self-Defense Force weapons, as shown in figure 2.

![Figure 2. The maintenance support for Japanese armored vehicle by Mitsubishi Corporation](image)

3. The institution building of Chinese Navy civil-military integration logistics support

3.1. The whole life-cycle logistics support mechanism

Influenced by traditional thinking, the combat and support capabilities of Chinese Navy warships have not developed synchronously at present, relevant support capability can not been formed after the warship service. Therefore, in order to meet the needs of high-strength and whole life-cycle support, it is necessary to establish a whole life-cycle logistics support mechanism for the warships. For the maximization of operational effectiveness and the minimization of logistics support cost, it is necessary to consider the relevant support issues synchronously or even in advance at all stages from project demonstration to warship retirement, and constantly revise the ship maintenance plan, resource allocation plan, retirement disposal plan and so on.

Hence, in order to maintain the industrial departments to provide whole life-cycle support services, the civil industrial departments should be actively involved in all the stages of warship development as an important part of the civil-military integration logistics support. And the civil industrial departments should be used to design the use and maintenance support plans in line with national conditions, and the plans should be constantly revised with the construction, service and retirement of warships.

3.2. The market competition mechanism

In recent years, the PLA has gradually adopted the centralized procurement and competitive procurement mechanism in the weapons procurement [6], and formed a relatively perfect market economy competitive procurement mechanism, which has made a significant improvement in the development level and procurement cost of weapons. Therefore, the competitive bidding mode should also be introduced in the process of civil-military integration logistics support of warships, for perfecting the market competition mechanism. Neither threshold nor wide absorption should be set, but quality and procedure should be guaranteed.

Especially, the network information platform such as Chinese Army Weapons Procurement Information Network, which has been popularized in recent years, should be used widely and actively. It is for releasing the requirement information of weapon’s logistics support activity, inviting the civil departments participate in weapons logistics support services extensive. Encouraging the benign market competition among different service providers and mobilizing the enthusiasm of local enterprises and civilian enterprises to participate in the weapons logistics support, that could not only prevent the market monopoly, but also could improve the support service quality continuously.

3.3. The joint logistics support mechanism

With the Liaoning and the Chinese first domestic aircraft carrier in service continuous and establishment of the Strategic Support Forces, it has become an important future development
direction of establishing carrier formation group, air-sea cooperative operation group and forming systematic combat capability. As a result, the multi-service integrated joint logistics support has become a hot topic in the reform of Chinese army's logistics support institutional in recent years, and a joint logistics support force of PLA had been established specially. Therefore, the civil-military integration logistics support of Chinese Navy warships can not be separated from the macro-structure of the overall support mechanism reform. Exploring the multi-service joint logistics support mode based on the future war scenarios such as aircraft carrier formation operations, integrated air-sea operations and so on, and building a multi-service civil-military integrated joint logistics support framework, which could realize the civil-military integrated joint logistics support for the sea, air, sky and shore. These has provide a fast and accurate integrated support service for the multi-service joint operations under the condition of informationization, and is an important supporting force for the national strategy of Chinese Navy.

4. The capability building of Chinese Navy civil-military integration logistics support

4.1. Research and development (R&D) capability of civilian enterprises

Today, the more and more local enterprises and civilian enterprises are willing to participate in the warships logistics support, which has a positive significance for improving the logistics support efficiency and reducing the whole life-cycle support cost. Yet, owing to the characteristics of small scale, lack of accumulation and pursuit of profits, either local enterprises or civilian enterprises have limited investment in the research of new materials, new technologies and new processes, and even more difficult to sustain basic research. They are difficult to meet the logistics support development trend of informationization, intellectualization and integration, which will inevitably restrict the development of warships logistics support. Therefore, more policy support should be given to local enterprises and civilian enterprises, and the incubation platform of new technology should be provided to improve their independent research and development (R&D) capabilities. In this way, it will promote the renewal of logistic support technology for Chinese Navy, and realize the Complementing each other and advancing side by side of military and civil technology development.

4.2. Peacetime and wartime transfer capability of civilian enterprises

Recent decades, logistic support tasks of Chinese Navy had been carried out in a relaxed and peaceful environment, especially in the industrial department and civilian enterprises, which had not experienced the test of real war. It is still unknown whether they can cope with the future high-intensity and information-based maritime war. In order to form the civil-military integrated logistics support capability to meet future maritime war, it is necessary to plan ahead and pay attention to improving the peacetime and wartime transfer capability of civilian enterprises. For example, the ‘Logistics Militia Supplementary Program’ military exercises held by the U.S. Army in 1999, had organized thousands of weapon support provider to participate in the live exercises,
which had enabled the civilian enterprises to gain valuable battlefield experience for making up many loopholes in the wartime support services. Hence, the Chinese Navy should learn from this mode of introducing civilian enterprises to participate in military exercises, so as to accumulate wartime logistics support experience and exercise the psychology in front of the battlefield, so that the peacetime and wartime transfer capability of civilian enterprises could be formed rapidly.

4.3 Quality management capability of civilian enterprises

As the purpose of civil-military integration logistics support is to provide efficient and high-quality logistics support services for weapon. Hence, it is necessary to improve the quality management capability of civilian enterprises. On one side, we can draw lessons from the experience of weapon’s logistics support quality management of U.S. Army, and develop a quality management system based on ISO-9000 series and GJB9001 series under the leadership of Chinese Navy. The local enterprises and civilian enterprises, which had participated in logistic support, should be included in the unified quality management system, so as to facilitate quality supervision and control.

On the other side, the choice of logistics support service providers should be strictly. The comprehensive consideration should be taking out from technical strength, business scope, holding background, past performance and other aspects, so as to improve the warship logistics support service quality from the source, and avoiding workshop-style individual enterprises mixed up among them. Addition, the third-party supervision mechanism could be introduced in logistics support according to the design and development experience of warships. The original warship development units, military internal support departments, China Classification Society (CCS) and other professional supervision organizations could be invited to participate in the whole process quality management of warship logistics support services, for improving the support quality continuously.

5. Conclusion

The civil-military integration logistics support of Chinese Navy should actively draw lessons from foreign successful experience, and build up the institution from aspects of establishing whole life-cycle support mechanism, improving market competition mechanism and establishing the joint logistics support mechanism. And then carry out the capacity building from improving R&D capability, peacetime and wartime transfer capability, quality management capability and so on, so that for improving the quality and efficiency of logistics support for Chinese Navy warships.

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