# Study on Requirements Analysis Model of the Equipment Support Decision-Making for New Type Operational Forces of Operation-Oriented

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***Abstract*—In view of the all requirements of the new type operational forces equipment support decision - making and analyzing the problems of the nonstandard analysis process, and on the basis of fully considering the decision-making characteristics of new type operational forces equipment support, the requirements analysis model is set up with the proposes to take the operational requirements as the traction and the framework of requirements analysis with supporting tasks as its content, it lays a foundation for realizing the optimization of equipment support decision-making.**

***Index Terms*—new type operational forces; equipment support decision-making; requirements analysis model**

Equipment support decision-making is the key of realizing the reasonable configuration of resources and the effective use of equipment. Operational requirement is the basis of equipment support decision and accomplishing operational purposes is an important standard to test the correctness of the equipment support decision. Accurate positioning of operational requirements can achieve accurate and efficient support in the decision-making process [1]. Therefore, operational requirements plays as a significant tractive action in the decision-making process of equipment support.

New type operational force is the main body of future combat [2]. A large number of high and new technologies have been applied to equipment, resulting in profound changes in the entire war pattern [3]. How to accurately grasp the war situation and make the best decision on equipment support is an important issue in our army's equipment support that urgently needs to be solved. Reasonable demand analysis is the main way to achieve scientific support. By analyzing the equipment support tasks in different stages of combat, this paper draws out the equipment support decision-making needs of new type operational forces and provides the basis for the equipment support decision-making.

## I. Principles of Equipment Support Decision of New Type Operational Forces

New type operational force, with the characteristics of specific periods, high degree of informatization, high content of science and technology, remoteness and precision, is the product of the application of high and new technology in weapons and equipment [4]. To implement equipment support for new type operational forces, we must first clarify the principles that must be followed in equipment support decision-making.

1. Accuracy. In the future high-tech war, the war pace will be very fast, the war intensity will increase and a large number of new type operational forces will be used [5]. Due to the complex characteristics of the new combat force system, the consumption of ammunition and maintenance equipment per unit time is bound to increase sharply. Therefore, it is required to make accurate equipment support decisions.

2. Timeliness. With new type operational forces put into fight, the war is becoming more unexpected, which not only highly requires the timeliness of decision-making, but also the difficulty of the decision increases [6]. Especially in the operational and tactical transformation period, presets situation can change at any time, therefore, the equipment support decision must be conducted decisively, analysis and judgment of the decisions must be rapidly made, and the equipment support must be implemented in time.

3. Pertinence. When formulating a support plan, it is necessary to give full consideration to the factors such as battlefield environment, the object of combat, combat strength, frequency of equipment use and etc., without neglecting the impact of these factors on the new combat force in actual combat so as to make corresponding preparations in advance [7]. Meanwhile, it is necessary to reasonably allocate support team and support materials to adjust equipment support according to the battlefield situation and ensure the full use of equipment in wartime.

## II. Framework for Analysis of Decision-Making Requirements for Equipment Support of New Type Operational Forces

Demand analysis is directly related to personal subjective consciousness, and the real "demand" only exists in the mind of the individual. Any form of "demand" outside the mind is the expression of the "demand" in the mind of the individual, which is only an objective description of the demand.

Equipment support decision-making analysis for operational requirements is based on operational needs

[8]. Through the analysis of information about combat missions, combat purposes and equipment plans, the personnel needed for the equipment support, ammunition, repair, maintenance supplies, distribution and so on are proposed. In this paper, an optimal support program under the premise of guaranteeing new type operational forces to achieve deterrence and combat effectiveness will be established, so that sustained and effective work of new type operational forces can be implemented and at the same time the basis for equipment support decision-making can be provided.

The analysis framework of operational equipment support decision demand is a standardized workflow determined for carrying out the equipment support decision demand analysis. The significance of constructing the framework is to clarify the research process, research content, principles and methods of the demand analysis and the information flow required. See figure 1.

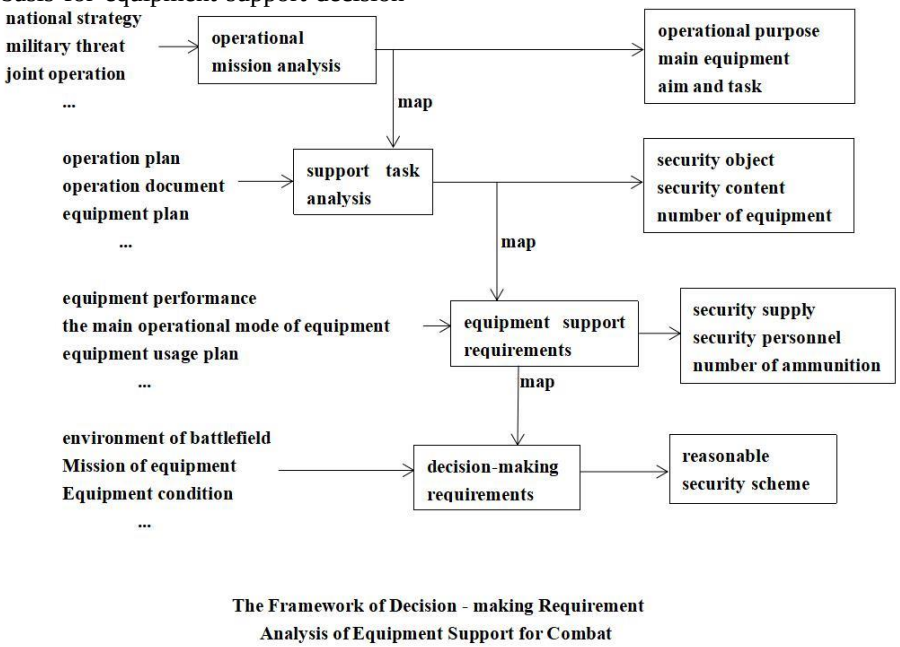


Figure1. Analysis framework of operational equipment support decision requirements.

Operational task analysis, which mainly includes pre-war research and judgment, operational process analysis, operational information flow analysis, operational activities and other contents, is the primary link of equipment support decision demand analysis for combat and the main basis for demand acquisition.

Support task analysis is the key to the analysis from the equipment support task domain to the target domain. Through the analysis of operational tasks, operational documents, equipment programs and other information, the object, content and quantity of equipment support are defined to further obtain the requirements of equipment support.

Equipment support demand analysis and equipment support decision demand analysis are the keys to the effective use of equipment [9]. By analyzing the state of equipment, environment and other information, the demand under the corresponding state is analyzed, so as to achieve the optimal equipment support scheme and achieve the purpose of rational decision-making.

## III. Decision-Making Demand Analysis Model for Equipment Support of New Type Operational Forces in Wartime

New type operational forces are the main strike forces in future wars and how to implement accurate support is the key to winning wars [10]. Therefore, a reasonable demand analysis model must be established on the premise of fully analyzing the tasks performed by the new type operational forces and the combat technical performance of equipment. Therefore, it is necessary to correctly understand the superior's operational intention and requirements for equipment support so as to have a definite object in view; there is a need to define the main operational direction and equipment, advance their deployment and give priority to their distribution, and to accurately grasp the situation of the battlefield, predict the possible situation and accurately grasp the equipment support personnel, support equipment and the corresponding marshalling configuration. On the basis of comprehensive consideration of all kinds of situations, a new type operational force equipment support decision demand analysis model is established as shown in figure 2.

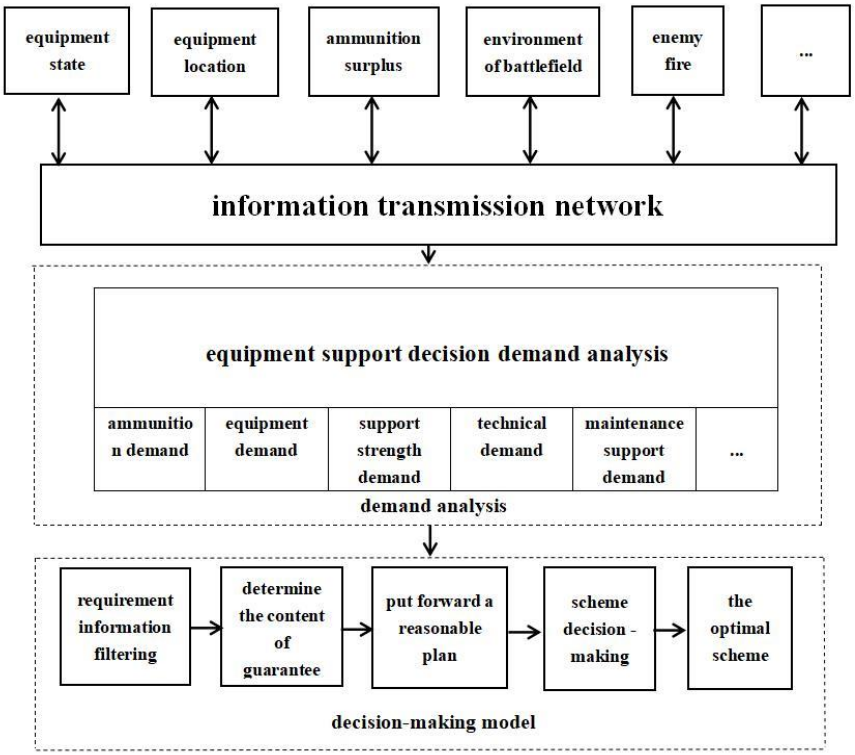


Figure 2. Decision-making demand analysis model of new type operational force equipment support.

In the figure above, in order to fully grasp the requirements of equipment support decision-making, it is necessary to obtain enough information. The information required refers to that about the reflection of the characteristics, state and changes of things in the battlefield generated in the process of combat and it includes all kinds of data that may affect the equipment operation as time changes in the process of combat. In the process of demand analysis, operational information must be taken into account, including battlefield environment, enemy fire, equipment status, equipment position, ammunition surplus and so on.

On the basis of all kinds of acquired information, the content needed for the equipment support is analyzed and the demand information of equipment support decision-making is defined. According to the information, on the basis of the comprehensive collection of combat department (sub) team positioning, equipment technical status, ammunition and equipment consumption and support department (sub) team positioning, state of safeguard power, the ammunition and equipment stock and more information, equipment support command authority puts forward a reasonable equipment support scheme, it provides support and basis for decision-making, realizes the optimal decision and ensures the maximum efficiency of equipment.

## IV. Case Analysis

To verify decision-making demand analysis model for equipment support of new type operational forces mentioned above, a certain type of reconnaissance UAV is taken as an example and it is supposed that it is carrying out reconnaissance missions, and due to the fact that the enemy radar discovers it and conducts intensive air fire. In order to ensure the UAV to continue to complete the task and not destroyed, the state will be analyzed comprehensively, and the support requirements will be determined to achieve the optimal decision. See figure 3.

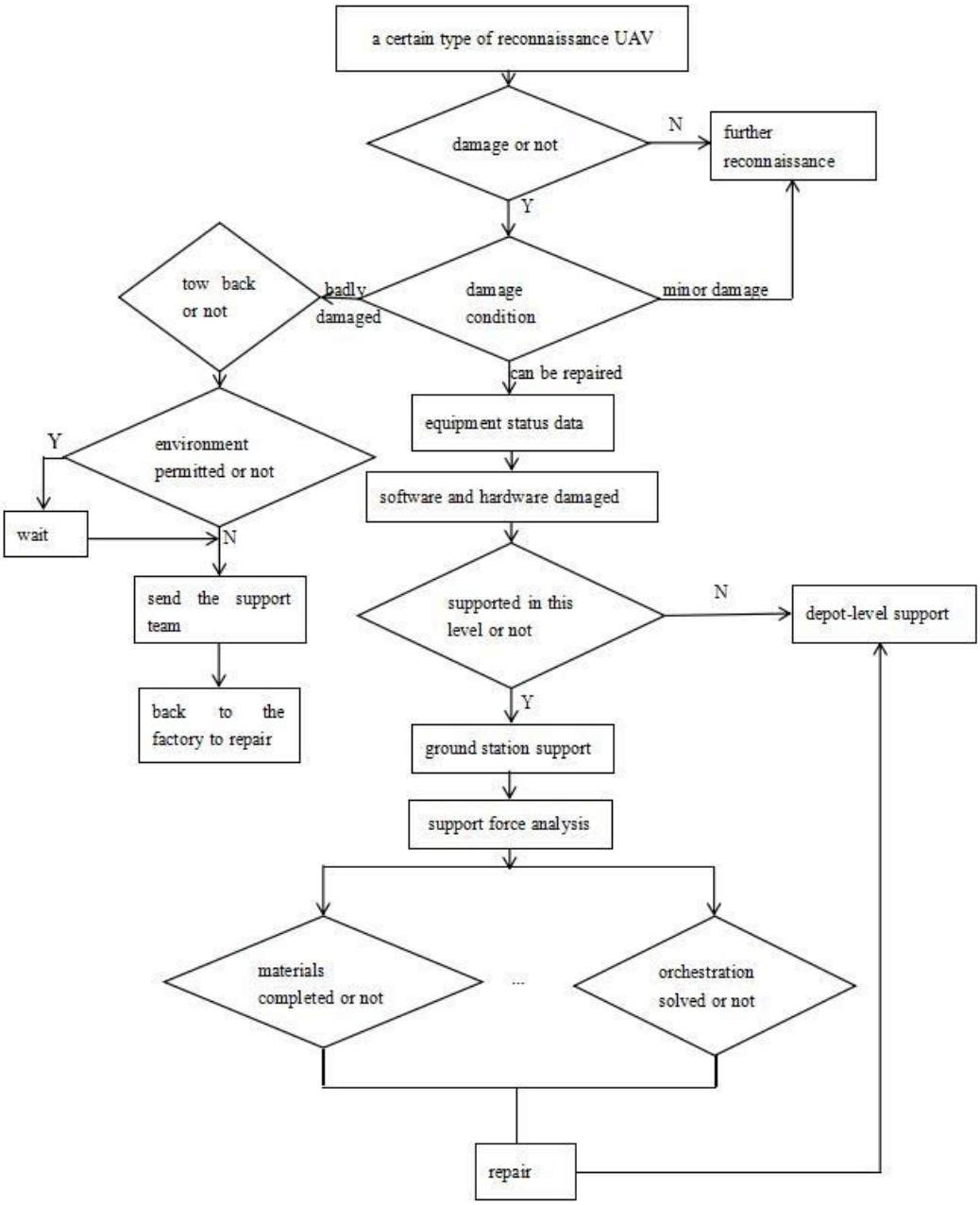


Figure 3. Decision-making Flow Chart of Wartime Equipment Support for a Reconnaissance UAV.

As it is shown from the figure, when analyzing the requirements of UAV equipment support decision, it is necessary to fully consider the battlefield environmental conditions, equipment status and other information and decide whether to tow back or send the support team, and to determine the required materials, the number of technical personnel and the technical force according to the damage situation.

## V. The Conclusion

The new operational force equipment support decision demand model proposed in this paper is based on the combat demand. On the basis of various factors, combined with the status information of equipment, the equipment support tasks are clarified, the requirements of equipment support are analyzed, and the decision-making basis for the equipment support decision is provided. Due to the variety of new type operational forces, the difference of performance and characteristics of equipment and the fact that the requirements of different equipment varies, there should be further study in this aspect.

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