International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

Sewaco Equipment Commonality Utilization Strategy To Support Kri Operational Readiness In The Refurbishment Program

Dwi Febri Santoso*[1], Edy Iwan Bangun[2], Suprayitno[3], Achmad Faisol[4]

[1234] Naval Operations Strategy Study Program, Naval Staff and Command College

Abstract

This article discusses the utilization of commonality of Sensor, Weapon and Command (Sewaco) equipment in supporting the operational readiness of the Republic of Indonesia Warship (KRI) in the refurbishment program. Refurbishment is necessary to maintain technical condition, update system capabilities, and maintain the relevance of Sewaco technology to operational needs. However, this process can temporarily reduce the readiness of the KRI because the ship must undergo dismantling, installation, integration, testing, and functional testing. This study uses a descriptive qualitative method with a literature study approach through a review of scientific literature, national regulations, maintenance concepts, logistical support, interoperability, and operational readiness. The results of the study indicate that Sewaco commonality can support KRI readiness through maintenance efficiency, accelerated troubleshooting, simplified spare parts management, increased personnel capabilities, and opportunities for temporary redistribution of components between KRIs of the same class. However, its utilization must be carried out in a controlled manner through inventory, technical verification, codification, asset recording, functional testing, and supervision to avoid creating technical, administrative, or operational risks. Thus, Sewaco commonality can be an instrument for managing the operational readiness of KRI in the refurbishment program in a more effective, measurable, and accountable manner in supporting the duties of the Indonesian Navy, especially in maintaining the continuity of operational element readiness.

Keywords:Commonality; Sewaco; Refurbishment; Operational Readiness; KRI

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

INTRODUCTION

As a key component of national defense at sea, the Republic of Indonesia Warship (KRI) is required to possess reliable combat capabilities to support the operational readiness of the Indonesian Navy (TNI AL). KRI readiness is determined not only by the availability of the ship's platform, but also by the readiness of its technical systems, personnel, logistical support, maintenance systems, and Sewaco capabilities, which support detection, identification, command and control, and weapons use (Prayitno, 2022).

The combat capability of a KRI is significantly influenced by the technical condition of its sensor, weapon, and command (Sewaco) equipment. Sewaco equipment is a crucial component of a warship's combat system, playing a key role in sensing, information processing, decision-making, and weapon engagement. Therefore, a decline in the technical condition of Sewaco can directly impact the KRI's combat and operational readiness. The Indonesian Navy (TNI AL) is obligated to ensure operational readiness for KRI, particularly in the technical conditions of Sewaco and Komlek. Therefore, an effective and efficient maintenance and repair strategy is required (Nugroho, Suharjo, Faisol, 2023).

One effort to maintain and improve the technical condition of Sewaco equipment is through a refurbishment program, which involves updating, rejuvenating, replacing, or upgrading equipment that has reached a certain service life. This program aligns with the need for modernization and maintenance of defense equipment to ensure it remains relevant to technological developments and operational demands.

However, the implementation of the refurbishment program also presents challenges to the operational readiness of the Indonesian Navy (KRI) within a certain timeframe. Ships undergoing refurbishment are generally not fully operational, as they require dismantling, component replacement, system integration, testing, calibration, and functional testing. This can lead to a decrease in the availability of KRI components to support operations.

In this context, the commonality of Sewaco equipment becomes crucial. Commonality can be understood as the degree of similarity of equipment, components, procedures, documentation, or systems that enables more effective shared use. In the context of defense standardization, commonality encompasses operational, administrative, logistical, and technical procedures, as well as the use of common, compatible, or interchangeable equipment, components, weapons, or tools (DSCA, 2026).

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

For the Indonesian Navy (TNI AL), the commonality of Sewaco equipment between ships of the same class or type can provide significant benefits. This commonality of equipment can facilitate training and familiarization of operators and technicians, accelerate troubleshooting, simplify spare parts management, increase maintenance efficiency, and open up opportunities for the temporary redistribution of equipment or spare parts from ships undergoing refurbishment to other ships of the same class that are still projected for operation.

Based on this description, this article discusses how the utilization of Sewaco equipment commonality in the refurbishment program can be used to maintain the technical condition of equipment in order to support the operational readiness of KRI. The study focuses on the relationship between commonality, logistical support, maintenance, spare parts management, temporary redistribution mechanisms and KRI operational readiness.

METHOD

This research uses a descriptive qualitative method with a literature review approach. This method was chosen because the study focuses on developing conceptual arguments regarding the use of Sewaco equipment commonality in supporting the operational readiness of KRI during the refurbishment program. This study analytically explains the relationship between commonality, logistical support, maintenance, spare parts management, and KRI operational readiness.

The data used is secondary data obtained from scientific literature, national regulations, defense doctrine, standardization and interoperability references, military operations readiness studies, and the concepts of Logistic Support Analysis and Integrated Logistics Support. National references used include scientific articles on KRI readiness, Sewaco maintenance, TNI AL defense equipment logistics management, defense equipment MRO, and Ministry of Defense regulations on material development, material maintenance, inventory control, and material codification. Meanwhile, international references are used to strengthen the concepts of commonality, interoperability, operational readiness, parts management, and logistics support analysis.

The data analysis technique was carried out in several stages. First, the researcher identified literature related to the commonality, interoperability, operational readiness, refurbishment, maintenance, and logistical support of military equipment. Second, data from various literatures were categorized into main themes, namely Sewaco equipment commonality, warship operational readiness, logistical support, maintenance, spare parts

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

management, and material redistribution mechanisms. Third, the relationships between these themes were interpreted to build conceptual arguments regarding the utilization of Sewaco commonality. Fourth, the analysis results were synthesized into a model of thinking regarding optimizing warship operational readiness based on Sewaco equipment commonality..

RESULTS AND DISCUSSION

Research result

Based on the results of the literature review, equipment commonality is one of the factors supporting the operational effectiveness and efficiency of logistics support in defense systems. Commonality is not only oriented towards the physical similarity of the equipment, but also aimed at increasing compatibility, interchangeability, and interoperability in the areas of operations, administration, logistics, technical, and materiel (DSCA). From a defense perspective, the greater the commonality of systems and components between platforms, the greater the opportunity to simplify logistics support, accelerate maintenance, and increase operational flexibility.

On warships, the commonality of Sewaco equipment has direct implications for operational readiness. If multiple warships within the same class or type share the same Sewaco equipment, maintenance, component replacement, personnel training, troubleshooting, and spare parts support can be carried out more effectively.

The study also shows that operational readiness is not only determined by the existence of a ship platform, but also by the ability of the ship, weapons systems, equipment, personnel, and logistical support to carry out missions according to their designed functions. Operational readiness relates to the ability to organize, train, and equip armed forces to successfully carry out tasks (RAND Corporation). Thus, the operational readiness of the KRI is greatly influenced by material readiness, Sewaco readiness, personnel readiness, logistical support, and maintenance systems. In the context of the Indonesian Navy, KRI readiness is also closely related to logistical support and the availability of spare parts. The implementation of integrated logistical support on KRI is influenced by the inventory system, organization, crew personnel, and budget (Hartanto, 2016).

The literature review also shows that Sewaco equipment refurbishment should be viewed as part of the system lifecycle management. Within the Logistic Support Analysis framework, logistical support is required from the acquisition process through major modifications, operation, maintenance, and even system or equipment disposal (DoD,

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

1984). Therefore, utilizing Sewaco commonality in the refurbishment program needs to be implemented through a measurable, documented, and accountable mechanism (Ministry of Defense, 2014).

The study concluded that Sewaco's equipment commonality has the potential to be an instrument for optimizing the operational readiness of the Indonesian Navy (KRI). This potential emerges through several aspects, including maintenance efficiency, ease of spare parts management, accelerated troubleshooting, improved personnel capabilities, and the opportunity for temporary redistribution of equipment and spare parts between ships of the same class.

DISCUSSION

1. *Commonality* Sewaco Equipment as a Supporting Factor for Warship Readiness

Sewaco equipment commonality can be understood as the similarity or uniformity of systems, components, software, maintenance procedures, technical documentation, and spare parts requirements on warships within the same class. In the defense context, commonality is closely related to compatibility, interchangeability, and interoperability. Standardization in the defense sector aims to achieve a level of commonality that allows units to act more effectively, efficiently, and support each other in operations (DSCA).

From an operational perspective, Sewaco's commonality provides several important benefits for the KRI. First, it simplifies the maintenance process because technicians encounter relatively similar systems, components, procedures, and technical documentation. Second, it accelerates troubleshooting because repair experience on one ship can be applied to other ships using similar systems. Third, it supports the efficiency of operator and technician training because operating procedures, simulations, and maintenance can be standardized. Fourth, it simplifies spare parts management because the types of spare parts required are more standardized.

These benefits align with the concept of parts management in defense systems. Good component management can improve availability, reliability, commonality, interchangeability, ease of maintenance, and reduce costs and the risk of obsolescence (Defense Logistics Agency, 2015).

Thus, Sewaco's equipment commonality holds strategic value because it can translate technical similarities into operational advantages. Equipment commonality not only reduces logistical complexity but also provides flexibility in managing ship readiness. The higher the level of commonality between ships of the same class, the greater the

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Indonesian Navy's opportunity to build a more efficient inter-ship logistics and maintenance support system.

2. Refurbishment and Challenges to Warship Operational Readiness

Refurbishment of Sewaco equipment is crucial to maintaining the technological relevance and combat capability of the Indonesian Navy (KRI). If Sewaco equipment experiences technical deterioration, limited spare parts, obsolescence, or is no longer capable of meeting modern operational requirements, the KRI's combat readiness will be directly impacted. The refurbishment program is essentially part of the maintenance, rejuvenation, and system enhancement activities so that the ship can continue to perform operational functions according to task requirements.

Challenges arise because refurbishment impacts not only technical aspects but also the availability of the KRI to support operations. A ship undergoing refurbishment requires time for dismantling, installation, integration, testing, calibration, and system function testing. During this process, the KRI's operational readiness status may decline. Therefore, refurbishment must be managed not only as an individual ship technical activity but also as part of the overall readiness management of a KRI class.

It is in this context that commonality becomes crucial. If ships of the same class share similar Sewaco equipment, certain spare parts or equipment temporarily unused on the ship undergoing refurbishment can be considered to support the readiness of other ships of the same class that have not yet undergone refurbishment but are projected to operate. In this way, refurbishment is not only seen as an individual ship modernization, but also as part of the operational readiness management within a single ship class.

However, the use of components from a KRI undergoing refurbishment must be done carefully. The transferred components must be registered, have valid technical status, conform to the configuration, not disrupt the refurbishment completion schedule, and must obtain authorization from the appropriate technical and logistics elements.

3. Utilization of Sewaco Spare Parts and Equipment through a Temporary Redistribution Mechanism

The use of Sewaco spare parts or equipment from KRI (Indonesian Navy) undergoing refurbishment can be done through a temporary redistribution mechanism. This mechanism aims to optimize component availability so that ships still required to carry out operations can maintain the readiness of Sewaco equipment. From an operational readiness perspective, spare parts management is part of the effort to equip

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

and maintain the ship's capability to carry out its duties. Positioning organization, training, and equipment of forces as critical elements in building operational readiness (RAND Corporation).

A temporary redistribution mechanism can begin with an inventory of the commonality of Sewaco equipment across several KRIs within a single class. This inventory includes equipment type, serial number, system configuration, technical status, service life, compatibility, documentation, and spare parts availability. Control of national defense material inventory emphasizes the importance of providing inventory data and information to support the planning, procurement, distribution, maintenance, and control of defense material (Ministry of Defense, 2014).

In addition to inventory, material codification is also crucial for ensuring the legal and standardized identity of components. Codification is a crucial instrument in organizing material data, including defense equipment and spare parts. With proper codification, components are assessed not only based on form or function, but also based on technical identity, inventory number, material status, and suitability for use.

The next stage is mapping the refurbished ships, those not yet refurbished, and those with operational priorities. This mapping allows for the determination of which spare parts or equipment are suitable for temporary use to support the operational readiness of other ships in the same class. Following this, technical verification of the material to be transferred is conducted, including component suitability, configuration suitability, inter-system compatibility, risks to the recipient system, and the impact on the donor ship's refurbishment schedule.

Once declared suitable, components can be installed on the receiving vessel, followed by functional testing, administrative record keeping, and readiness monitoring. This process is crucial to ensure that the use of commonality does not create uncertainty regarding the asset status, operational safety, and reliability of Sewaco equipment. Conceptually, the commonality utilization process can be described as follows:

Sewaco commonality inventory → identification of refurbishment vessels and priority operation vessels → verification of component suitability → temporary redistribution → installation and functional testing → readiness monitoring → return or replacement of components.

Through this mechanism, Sewaco's commonality can be transformed into an instrument to reduce downtime. A KRI experiencing Sewaco equipment failure does not have to wait for new spare parts if compatible components are available from a similar KRI that is not currently projected for operations. However, this mechanism must remain

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

within the framework of technical, logistical, administrative, and operational oversight. Spare parts availability contributes to KRI readiness, making spare parts management a critical factor in maintaining operational readiness (Wibowo, 2025).

4. Technical, Administrative and Operational Risks

While commonality has its benefits, some risks still need to be considered. The first risk is technical, particularly when seemingly identical equipment and parts actually differ in configuration, software version, interface, or integration specifications. In the Sewaco system, even small differences in system configuration can impact the integration of sensors, command and control systems, weapons control, and data communications. Therefore, component installation cannot be based solely on similarity in form or function; it must undergo technical verification, integration testing, and functional testing.

The second risk is administrative and asset accountability. Every transfer of equipment or spare parts between KRI (Indonesian Navy) vessels must be clearly recorded to avoid discrepancies in asset data and unclear material status. This aligns with the principles of national defense material inventory control, which emphasize the importance of inventory data and information to support material distribution, maintenance, supervision, and control (Ministry of Defense, 2014).

The third risk is the risk to the completion target of the donor KRI refurbishment program. If component utilization is not properly planned, the refurbishment completion could be disrupted. Therefore, temporary redistribution must consider the work schedule, reintegration needs, the availability of replacement components, and unit readiness priorities.

The fourth risk is operational and safety risk. Sewaco equipment and spare parts installed on recipient vessels must be able to perform safely and reliably under operating conditions. Therefore, installation must undergo functional testing and validation by authorized technical personnel. Without such mechanisms, the use of commonality could actually reduce system reliability and pose a risk to operational safety.

Considering these risks, Sewaco's use of commonality must be managed with caution. Commonality does not mean all components are freely interchangeable. Commonity must be demonstrated through technical data, configuration conformity, suitability status, material codification, asset records, and valid authorization.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

International Journal of Economics, Business and Innovation Research
https://e-journal.citakonsultindo.or.id/index.php/IJEBIR
E-ISSN : 2964-0865
IJEBIR

CONCLUSION

The conclusion of this study shows that the commonality of Sensor, Weapon and Command (Sewaco) equipment has a strategic role in supporting the operational readiness of the Republic of Indonesia Warships (KRI) in the refurbishment program. The similarity of systems, components, technical documentation, maintenance procedures, and spare parts between KRIs of the same class can improve maintenance efficiency, accelerate troubleshooting, simplify logistics management, and increase the effectiveness of personnel training. In addition, commonality opens up opportunities for the temporary redistribution of spare parts and equipment from KRIs undergoing refurbishment to other KRIs prioritized for operations, so that operational downtime can be reduced. However, the utilization of commonality must be implemented in a measured manner through inventory, technical verification, material codification, asset recording, functional testing, and strict supervision to avoid creating technical, administrative, or operational risks that can affect the safety and reliability of the Sewaco system.

This study still has limitations because it uses a desk study approach and therefore is not supported by empirical field data, quantitative measurements of operational readiness levels, or direct evaluation of the implementation of Sewaco component redistribution on KRI. Therefore, further research is recommended to use mixed methods or field case studies to measure the effectiveness of commonality in improving operational readiness, logistics cost efficiency, and speed of ship readiness recovery. Future research can also develop a commonality management model based on digital inventory and integrated logistics support to support real-time decision-making. Practically, the results of this study can provide input for the Indonesian Navy in developing Sewaco standardization policies, spare parts management, and more integrated refurbishment planning to maintain the continuity of KRI operational readiness.

REFERENCES

Defense Logistics Agency, 2015. Parts Management Guide. Fort Belvoir: Defense Logistics Agency.

Defense Security Cooperation Agency, 2026. Standardization. Security Assistance Management Manual. Washington, DC: Defense Security Cooperation Agency.

Hartanto, YA, 2016. Logistics Management in Improving the Combat Readiness of Indonesian Navy Defense Equipment. Journal of Defense & National Defense, 6 (1), 225–244. Bogor: Republic of Indonesia Defense University.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.

Herdianto, Y., Kurniawan, EA and Harahap, IR, 2025. Selection of Kri Koarmada II Based on Technical Readiness and Sewaco in the Context of Joint Maritime Operations. Jiip: Scientific Journal of Educational Sciences, 8 (12), 13395–13404. Dompu: Stkip Yapis Dompu.

Ministry of Defense of the Republic of Indonesia, 2014. Regulation of the Minister of Defense Number 4 of 2014 Concerning the Main Points of Implementing the Codification of Materials in the National Stock Number System within the Ministry of Defense and the Indonesian National Armed Forces. Jakarta: Ministry of Defense of the Republic of Indonesia.

Ministry of Defense of the Republic of Indonesia, 2014. Regulation of the Minister of Defense Number 12 of 2014 Concerning the Principles of National Defense Material Development within the Ministry of Defense and the Indonesian National Armed Forces. Jakarta: Ministry of Defense of the Republic of Indonesia.

Ministry of Defense of the Republic of Indonesia, 2014. Regulation of the Minister of Defense Number 66 of 2014 Concerning the Implementation of Material Maintenance Guidance within the Ministry of Defense and the Indonesian National Armed Forces. Jakarta: Ministry of Defense of the Republic of Indonesia.

Ministry of Defense of the Republic of Indonesia, 2014. Regulation of the Minister of Defense Number 77 of 2014 Concerning Control of State Defense Material Inventory within the Ministry of Defense and the Indonesian National Armed Forces. Jakarta: Ministry of Defense of the Republic of Indonesia.

North Atlantic Treaty Organization, 2022. Standardization. Brussels: North Atlantic Treaty Organization.

Prayitno, ME, Sudiarso, A. and Sianturi, D., 2022. Improving the Readiness of the Republic of Indonesia Warship (Kri) of the Jakarta Military Sea Crossing Unit to Support Military Sea Transportation. Journal of Defense & National Defense, 12 (1), 1–15. Bogor: Republic of Indonesia Defense University.

Rand Corporation, 2026. Operational Readiness. Santa Monica: Rand Corporation.

United States Department Of Defense, 1984. Mil-Std-1388-1a: Logistic Support Analysis. Washington, DC: Department Of Defense.

Wibowo, N., Lestiani, M., Maniah, M. And Waskito, S., 2025. Contribution Of Naval Competence And Spare Parts To Kri Readiness. Proceedings Of The 8th International Conference On Business, Economics, Social Sciences, And Humanities—Economics, Business And Management Track, 169–182. Cham: Springer.

Copyright at authors some right reserved this work is licensed under a Creative Commons Attribution-ShareAlike 4.0 International License.