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THE ROLE OF COMMUNICATION ASPECTS IN THE INTEROPERABILITY OF SECURITY OPERATIONS AT **THE INDONESIAN ARCHIPELAGIC SEA LANES I** Ikhwan Syahtaria¹, Okol Sri Suharyo² ¹Indonesia Defense University, IDU Jakarta Indonesia ²Indonesian Naval Technology College, STTAL Surabaya Indonesia **ABSTRACT** The challenges in communications between the military aircraft and warships, caused by the execution of operations within different periods and at a different area of operations, makes the military aircraft-warship coordination for the search and identification of targets difficult.

The role of interoperability carried out by Military aircraft elements with the Indonesian warship (KRI) **in the Indonesian Archipelagic Sea Lanes I** (ALKI-1) Security operation found several problems that were not in line with the supposed interoperability role. The problem in this research is how the role of Military aircraft interoperability with Indonesian warship (KRI) elements in **the implementation of the Indonesian Archipelagic Sea Lanes I** Security Operations.

The **purpose of this study is to analyze the** extent of the military communication system problems that existed between military aircraft and Indonesian warship (KRI) in **the implementation of the Indonesian Archipelagic Sea Lanes I** Security Operations with Qualitative Descriptive methods by Nvivo software and Borda analysis to find out **the order of priority** criteria.

The **results of the study show that** tight coordination is needed regarding the timing of operations so that the interoperability of the implementing elements can be integrated, coordinated and become a good system so that **The Indonesian Archipelagic Sea Lanes I** (ALKI-1) security operation can be carried out effectively and efficiently.

Keywords: Interoperability, Communications, Security Operations, Indonesian Archipelagic Sea Lanes I (ALKI-1)

INTRODUCTION In accordance with the results of the United Nations Convention Indonesia recognizes as an archipelagic country and with a large enough area, the sea in Indonesia has a very important role for international shipping so that there need to be security controls to maintain the sovereignty of the territorial waters of the Republic of Indonesia by providing 3 shipping lines that can be traversed by ships from other countries to be able to pass through the archipelagic sea lanes (The Right of Archipelagic Sea lanes Passage).

One of the three Indonesian Archipelagic Sea Lanes found in the territory of Indonesia that can be used as international shipping traffic is Indonesian Archipelagic Sea Lanes I (ALKI-1) which consists of the Sunda Strait, Karimata, Natuna, and South China Sea. Determination of Indonesian Archipelagic Sea Lanes in addition to having a positive impact on national development activities for the welfare of the people can also pose a potential threat to Indonesia's national interests.

Potential threats in Indonesian Archipelagic Sea Lane I (ALKI-1) will certainly have an impact on the aquatic environment and surrounding islands. There are still many violations in several regions of the Republic of Indonesia, requiring an active role from all parties. To anticipate all forms of violations and threats above, a more stringent observation and supervision is needed so that overall security for Indonesian jurisdiction is required for all forms of threats.

The Indonesia Armed forces as a means of national defense has an important role in implementing state policies for securing and maintaining national sovereignty and territorial integrity, protecting the honor and safety of the nation. The application of the principle of integrated Armed Forces is the principle of interoperability among all Indonesian armed forces in doctrine, strategy, operations and training, defense equipment and the logistics and communication system.

One form of the implementation of this interoperability is an operation carried out jointly by the Air Force and the Navy in the Indonesian Archipelagic Sea Lanes I (ALKI-1) security Operation. Operations that are based on interoperability between the elements of the perpetrators in their implementation will obtain maximum results where the input data obtained from elements in the field related to the forms of violations that occurred, the location where the violations occurred, and the impact caused by violations This will be directly accepted by the operator and can be used directly as a material consideration for the leadership in making decisions on what steps should be taken related to these violations.

The role of interoperability carried out by elements of military aircraft with Indonesian

warships (KRI) in Operation Security of the Indonesian Archipelago I (ALKI-1) has an important role in determining the speed of action and coordination and special attention should be paid to the leaders of the Indonesian Armed Forces, with the ultimate goal that the role of interoperability between the Military Aircraft and Indonesian warships (KRI) can run well and that security in the Indonesian Archipelago Sea Line could be awake.

This paper has many works of literature to support the research, such as literature with title *Achieving Data Interoperability of Communication Interfaces for Combat System Engineering* (Seo, Park, & Lee, 2017), *Interoperability of Information systems Managed and Used by the Local Health Departments* (Shah & Gulzar, 2016), *Building an inter-organizational communication network and challenges for preserving interoperability* (Bueger, 2008), *A Solution for Interoperability in Crisis Management* (Pérez, Zambrano, Esteve, & Palau, 2017), *Open Standards And Open Source: Enabling Interoperability* (Almeida & Oliveira, 2011), *Interoperability: Stop Blaming the Radio* (Timmons, 2007), *The Internet Of Things: New Interoperability, Management And Security Challenges* (Elkhodr & Shahrestani, 2016).

This research is organized as follows, chapter 1 introduction, chapter 2 shows material and methods, chapter 3 shows the results of data and discussion, chapter 4 conclusion.

2. MATERIAL AND METHODS

2.1. The Concept of Interoperability. Interoperability according to Sterling D. Session and Carl Jones can be said as a combination of equipment, procedures, doctrine, and training, or as the ability of individuals, organizations, and equipment to carry out joint operations to be effective.

It is also explained in the Merriam-Webster Dictionary that the meaning of the word interoperability is the ability of a system to become a weapon system so that it can be integrated and work with parts of another system. Kenneth Gause also explained Interoperability as a condition where the achievement of an electronic communication system among fellow users, marked by the information that can be shared and run well.

According to researchers, Interoperability is a condition where several elements of both equipment and humans with all the things they have become one in a system and are well connected to receive mutual information that is interacted in two directions (Kofuji, 2019). In an Operation, this allows forces, units or systems to operate together which requires them to share common doctrines and procedures, infrastructure, bases with each other, and to be able to communicate with each other (Alcaraz, 2016).

2.2. The Military Communication Theory.

Military communication is the definition of a transmission medium that connects military

components in a battle or war. Communication technology infrastructures such as telegraph, post, train, satellite, mass media, as well as concepts in that field are created not to create peace. If in the history communication was born to be a warrior, why then do we come to believe that communication is a neutral matter in itself a question.

Even in Indonesia lately, communication, schools are praised as the most popular schools. / Figure 1. The Communication Model There has been a refinement from the face of communication war, through changes in communication technology, changes in concepts, and even changes in the way humans think about communication itself.

When communication is understood as a sign of progress and part of the culture, communication no longer appears as an instrument of war. According to the Researcher, Communication is the involvement of the whole person, way of speaking, attitude, behavior, and everything that radiates a person in conveying a message that is done directly or using a media so that there are an understanding and a reciprocal or two-way relationship between actors (Jary, 1998).

2.3. Theory of Integration. The term integration is often used to indicate the process of combining two or several different objects into a whole. Integration is also defined as a set of logic and procedures to improve system performance, cost and time efficiency, design, installation, operation, the configuration of one or several existing systems. Integration starts from the economic aspect then spreads to social, cultural, political integration and defense and security.

Integration can last a long time due to perceptions, views, and feelings of a mutual need for one another so that all members will maintain the integration process. From some of the definitions of integration, the researcher concludes that to be able to carry out system integration in an organization, a sequence of steps, processes, and strategies based on the goals or objectives of system integration is needed.

Integration can be said as an effort to combine two or more existing systems (Eveland & Cooper, 2013). 2.4. Theory of System. The system is generally defined as a complex whole, which is composed of several components that are connected to each other, which makes it easy in the course of one or several processes.

Related to the system in the field of data or information exchange, it will talk about three main things, namely software, hardware, and the ability of the human brain. These three aspects will be interconnected with a collection of procedures in shaping the system and then carrying out its functionality. System theory according to Easton is a model that explains the particular relationship between each system as a unit that could

be in the form of society, trade unions, government organizations. System According to system researchers is a relationship that arises as a result of an activity or certain circumstances.

The system can also be called causality because there are causal relationships that arise and influence one another in their interactions (Chikere & C, 2015). 2.5. Theory of Coordination Coordination is a collaborative effort between agencies, agencies, units in carrying out certain tasks in such a way that it is complimentary, mutual assistance and complimentary.

Meanwhile, coordination is the arrangement of relations between joint efforts to obtain unity of action in the pursuit of shared goals as well. The definition of coordination according to Handoko is considered as a process of integrating goals and activities in separate units (Departments or Functional Areas) of an organization to achieve organizational goals efficiently.

Coordination is a process that regulates so that the division of work of various people or groups can be arranged into an integrated roundness in the most efficient way possible. From some of the above understanding, researchers can conclude that the notion of coordination is a collaborative effort between separate units or units of an organization to create unity in achieving common goals.

The combined conclusion of the notion of coordination is the effort of collaboration to unite activities so that harmony is achieved in the implementation of tasks or work to achieve common goals efficiently (Weigand, 2003). 2.6. Theory of Security A security expert, Barry Buzan, said that the concept of security can only be understood by integrating the level of analysis and the security dimension. Buzan divided the analysis into individual, national and international levels both regional security and the broader system.

While the security dimension consists of military, political, societal, economic and environmental security. The basic concept of security, according to Rooper is related to a person's ability to avoid danger, which is determined by the knowledge and awareness and motivation of that person to take preventative measures.

There are three important factors related to security, namely: the level of knowledge and awareness of the individual, the physical and mental ability to make prevention efforts, as well as the physical environment which is harmful or potentially dangerous. According to researchers, the conception of security comes from security theories that focus on maximizing protection measures undertaken by military and non-military

bodies to ensure the survival of a community's life.

This is in line with the understanding that to obtain security, it is necessary to act/ activity which is to secure something important. So from this terminology, the definition of security was born (Arhin, 2018). 2.7. Borda Analysis. The Borda Method proposed by its inventor Jean Charles de Borda in the 18th century is one of the methods used to determine the best alternative of the selected alternatives. Each alternative decision-maker will be judged by its weight based on its ranking. The biggest weight is the best alternative for decision-makers.

The basic idea in the Borda Method is to give weight to each of the first ranking criteria, second rank, and so on. The Borda Method is one method that can be used to accommodate the ranking of decision-makers who use weights at each ranking position generated by decision-makers (Korhonen, Moskowitz, & Wallenius, 1992). 2.8. Nvivo Software NVivo is a software program used for qualitative and mixed-methods research.

Specifically, it is used for the analysis of the unstructured text, audio, video, and image data, including (but not limited to) interviews, focus groups, surveys, social media, and journal articles. It is produced by QSR International. As of July 2014, it is available for both Windows and Macintosh operating systems. Nvivo can analyze and organize unstructured text, audio, video, or image data, playback ability for audio and video files, so that interviews can easily be transcribed in NVivo. Ability to capture social media data from Facebook, Twitter, and LinkedIn using the NCapture browser plug-in.

Import notes and captures from Evernote - great for field research. Import citations from EndNote, Mendeley, Zotero, or other bibliographic management software - great for literature reviews. 2.9. Joint Communication System. The doctrine of the joint communication system comes from the doctrine of the American armed forces wherein this Doctrine describes the communication used in joint operations, among others, as follows: a). The Role of the communications System, b). Command and Control, c). Communication System Function, d).

Principles of Communication Systems (Park, 2015). 2.10. Research Methodology To solve problems in the observed research, steps are needed and determined to describe the approach and model of the problem. The steps taken are: (1) Identification of the communication aspects in the Interoperability of Security Operations, (2) Study Literature, (3) Data Collection, and Expert Brainstorming, (4) Data Processing, and Nvivo Software (5) Data Analysis, and Borda Methods (6) Interpretative of Conclusion.

Target: The purpose of this research is to analyze the extent of the military

communication system problems that existed between military aircraft and Indonesian warship (KRI) in **the implementation of the Indonesian Archipelagic Sea Lanes I** (ALKI-1) Security Operations. Steps: The step of this research is step 1 to identify problems by looking at internal and external factors, step 2 conducting the analysis, step 3 analyzing system, step 4 giving suggestions for improvement and conclusions. 3.

RESULT AND DISCUSSION One of the criteria in Interoperability is communication which becomes the basis for the success of operations so that the steps taken are to determine the sub-criteria in the communication criteria, among others, the language of communication, distance, and equipment. Then in the next step, we determine which criteria are the first, second and third priority.

The determination of the order of these criteria is intended to obtain the results of the choices of experts on various matters closely related to communication. Existing criteria and greatly affect the establishment of good communication are: a. The Language of Communication The language of communication is very important in the success of communication.

In **the absence of a standard language** that has been agreed between the various parties used in the communication system **in the Indonesian Archipelagic Sea Lanes I** (ALKI-1) Security Operations, it caused the communication failure. Agreed language issues are also not regulated in the Operational Plan. So each element uses its language partially and causes incomprehension with other elements. b.

Distance The purpose of distance here is how far is the position between the warship and fighter in conducting operations, in this sense, of course, it is that the farther the position between the elements, the greater the failure in communication. Likewise, for the opposite, the closer the elements that communicate, the smaller the communication failure will be.

The problem of distance in communication is of course also greatly influenced by the **specifications of the equipment** used in the implementation of communication between elements. c. Equipment The equipment referred to in the success of communication here is the **technical specifications of the equipment** used between the elements. This determines because if the **technical specifications of the equipment** used are good and following the specified standards, the greater the possibility of communication can be intertwined and vice versa if the **specifications of the equipment** used do not meet the standards, it will be the cause of the failure of communication between elements. Table 1.

Expert Choice Brainstorming in Criteria / Based on the results of a questionnaire of four experts who are competent in the knowledge of the success of communication with operations found that: a). Expert 1 considers that the language problem is first, while the equipment is second, and the distance is last. b). Expert 2 considers that the language problem is in the first rank while distance is in the second rank and equipment is in the last rank. c).

expert 3 considers that language problems are in the first place while equipment is ranked second and last, is distance. d). Expert 4 considers that the problem of equipment in the first rank, then the problem of distance in the second rank and the last rank is the problem of the language used. The next stage is weighting and the results of weighting are following the following Table 2: Table 2.

Rank and Weight of Variable by Borda Analysis / / Figure 3: Weight Diagram of Variable (1.Language, 2. Distance, 3. Equipment) Based on the results of priority weighting processing according to the data above, the language problem is ranked first with a weight value of 0.5 while the communication equipment problem is ranked second with a weight value of 0.33 and in the last rank is the problem of distance with a total weight value of 0.17.

Based on communication theory and the Joint Communication System it is clearly illustrated that the problems that occur in the role of aircraft interoperability in the security operations of The Indonesian Archipelagic Sea Lanes I, especially communication problems are caused by the absence of reciprocal or two-way relationships between actors in the field due to the great distance between the elements of the aircraft with the Indonesian warship (KRI) element.

Based on brainstorming with expert and data processing with Nvivo software, the results are obtained to overcome these problems, several strategies can be done, including: 1). Carry out operations together and planned carefully to minimize some of the errors that might occur by increasing coordination between elements. 2). Comply with the technical specifications of the equipment used in the operating element so that it will be known with certainty the communication net will be effective at certain distances and conditions that will make communication well established. 3).

The implementation of the rules for involving the military aircraft element in the Indonesian Archipelagic Sea Lanes I Security operation was as a reconnaissance element to support the implementation of the Indonesian warship (KRI) element as an action in the sea of the Indonesian Archipelagic Sea Lanes I region. 4). Command and Control must be established in two directions between the controlling element and the

implementing element in deciding on the implementation of the Indonesian Archipelagic Sea Lanes I (ALKI-1) Security Operations. 4.

CONCLUSION Communication is one element of interoperability and will be very complex when used in a joint operation involving 2 or 3 forces. The occurrence of a communication process, in theory, does depend on the frequency used in the operation, but it turns out in the field it is difficult to implement. Communication equipment used by military aircraft and Warship elements even though the procurement process is not concurrent is no longer a significant problem.

However, the considerable distance between the elements of the aircraft and warship at the time of the operation caused the communication could not be established properly so that interoperability was less than the maximum. ACKNOWLEDGEMENT The authors greatly acknowledge the support from Indonesia Naval Command and Staff College, Naval Operation Strategy Study Program, Seskoal Jakarta for providing necessary resources to carry out this research work.

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