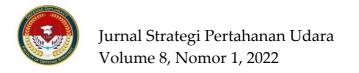# INTEROPERABILITY OF COMMAND TROOPS WITH COMBAT AIRCRAFT AND HELICOPTER PERSONNEL IN SUPPORTING COMBAT *S EARCH AND RESCUE* OPERATIONS

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A b s t r a c t - *The interoperability of the Paskhas (Indonesian Airforce Special Troops) Combat SAR (CSAR) Team with elements of RESCAP and RESCORT combat aircraft and CSAR helicopters is very much needed in the implementation of Combat SAR Operations. However, exercises are rarely carried out with the dynamics of actual and complex Combat SAR operation scenarios, at this time the exercises are only limited to demonstrations of Combat SAR operations. The current problems are the lack of Ground Forward Air Control (GFAC) capability of the Combat SAR (CSAR) team, the lack of training with aircraft elements, special equipment and limited infrastructure, and the absence of software to support the creation of Interoperability of the Paskhas Combat SAR (CSAR) Team with elements of fighter aircraft and helicopters. The purpose of this study was to analyze the existing and ideal conditions of interoperability of the Combat SAR Paskhas team with the crew of RESCAP, RESCORT and CSAR helicopters to support Combat SAR operations and the efforts made to overcome these interoperability constraints. The method used is qualitative. The results of the discussion of this study are that the interoperability of the Paskhas Combat SAR (CSAR) Team with elements of RESCAP fighter aircraft, RESCORT fighter elements, and CSAR helicopter elements is not optimally.*

Keywords: Interoperability, Capability, Paskhas (Indonesian Airforce Special Troops), Combat SAR Operations
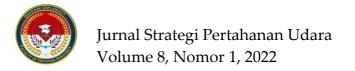
1.   **Introduction**

As listed in the Act Number 34 of 2004 concerning Indonesian National Armed Forces Articles 5 to 7, TNI as tool the defense of the Unitary State Republic of Indonesia, implement policy national defense for enforce state sovereignty , defend territorial integrity , and protect safety nation , run operation military for war (OMP) and operations military besides war (OMSP), as well as follow by active in Duty maintenance regional and international peace . TNI also has Duty for always build ability implemented national defense by Keep going continuously and continuously , with pay attention and consider every threats , distractions , obstacles , and challenges real good _ nor potential . The performance of TNI personnel as component main could seen as indicator from how maintenance National defense is carried out in each dimension , including the Indonesian Air Force (TNI AU).

Based on the decision of the rafters No Kep /545/V/2019 regarding TNI AU Swa . Doctrine Bhuwana Forced , that one _ TNI AU operations which include Special Air Operations (OUK) namely combat SAR operations . In implementation combat SAR operations there is a number of element the air involved in between i.e. Sarpur Team Paskhas is below _ _ the ranks of the Special Forces Corps (Korpaskhas) of the Indonesian Air Force and elements aircraft combat as well as aircraft Indonesian Air Force helicopter . Korpaskhas as one _ command The main TNI Air Force has role strategic in national defense , where have Duty build strength and ability unit Paskhas as troops dimension air for ready operational in doing scramble target and defense object Air Force strategic , defense air , operation special and special dimension air in operation military on policy Commander of the Indonesian Armed Forces (Regulation) Head Air Force Staff Number 11 of 2013, regarding Trees Organization and Procedure Headquarters Command of the Special Forces Corps of the Indonesian Air Force). Sarpur Team Paskhas alone is unit Executor below _ Detachment Dimension Special Forces (Denmatra Paskhas) who carry out tasks search and rescue of survivors in the area operation .
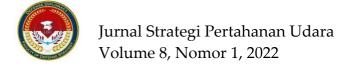
Based on the Commander's Decision Indonesian National Army Number Kep /545/V/2019 May 22, 2019 regarding TNI AU Swa . Doctrine Bhuwana Forced , explained that Combat SAR Operation is operation air involving _ various element air (airplane reconnaissance , plane fighter , aircraft helicopter , plane transport , and troops) aim for To do action rescue valuable personnel , materials, and documents strategic in the area operation . Amount elements involved _ in operation this need something procedure possible implementation _ arrange about technical implementation operation the so that could done by integrated , effective safe and appropriate with applicable regulations . _ Besides Therefore , interoperability is also demanded by each company elements involved _ in Combat SAR operations . That thing in accordance with what was delivered Commander of the Indonesian Armed Forces, Air Marshal Hadi Tjahjanto (2018), that related with strengthening TNI posture to front , one of them is development system -based Tri Matra operation _ technologies that include Network Centric Warfare, C4ISR and Cyber Warfare as well as realize system procurement Alutsista guided by effects based and interoperability. In something mission Sarpur Team operation always connected with element plane , ok aircraft combat or Helicopter . However implementation practice scheduled routine _ still not enough between Sarpur Team with element aircraft fighter and plane helicopter To use increase interoperability third element that .

Combat SAR Operation involve a number of element that is element combat , element helicopter , element spy , element transport and elements Easter . So that personnel combat SAR team Paskhas must capable realize interoperability with elements that . so that could realize interoperability with crewman aircraft fighter and crew CSAR helicopter in something combat SAR team Paskhas must there is GFAC qualified personnel to be able control aircraft rescue escort combat and CSAR helicopters while carrying out *close air support* in combat SAR operations . But currently inside _ _ _ combat SAR organization Paskhas in accordance Regulation

Head Air Force Staff Number 15 of 2013 Dated June 25 , 2013 About Trees Organization and Procedure Detachment Matra 1 and 2 Paskhas , that no there is GFAC qualified personnel .

Interoperability is a concept that recognizes importance how do people do profession in something system so that explain related activities _ with work (Greenbaum and Kyng , 1991; Button and Harper, 1996). Interoperability can also be interpreted as equipment procedures , doctrine and training , and capabilities person , organization , and equipment for operate together by effective (Session, 1993). Someone who works in something field special must could describe profession this to others, because every the place work is unique so that required interoperability in see organization military and describe something area or operating mandalas (Suchman , 1995). Interoperability Structural and Semantics Among objects learning and resources power more on the internet pointing to direction semantic web technologies in general and ontologies in particular as provider solution . Difference structure and diversity semantics Among ontology need solved for produce Shared ontology that facilitates ability learning object for used back . (Junaedi , 2016). According to Robkin (in Hidayat , 2017) Interoperability in the military world related with C4ISR (Command, Control , Communications, Computers, Intelligence, Surveillance, Reconnaisance) or in term Indonesian military is K4IPP (Command , Control , Communication , Computer , Intelligence , Observation , Reconnaissance) in which interoperability is booster ability main (key enabler) implementation operation effective , collaborative , and multi -organizational military or unit in whole spectrum operation . In Minister of Defense Regulation Republic of Indonesia Number 8 of 2016 concerning Implementation of Special Telecommunications within the Ministry of Defense and the Indonesian National Armed Forces Article 1 paragraph (7) states " Command , Control , Communication , Computer , Intelligence , Reconnaissance and Observation hereinafter called K4IPP is something system that integrates and synergizes elements Command , Control , Communication , Computerization , Information , Observation and Reconnaissance To use increase
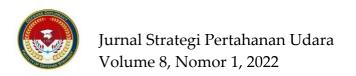
quality command and control leader Defense / TNI to elements executor nor system weapon by fast and precise in skeleton interest Duty national defense ". Communication is incident conveying human ideas . From understanding this could concluded that communication is a delivery process messages that can be in the form of message information , ideas, emotions , skills and so on through symbol or symbol that can be cause effect in the form of Act behavior done _ with certain media (Effendy, 2005).

2.   Literature Review

2.1   Theory Interoperability

Interoperability is a concept that recognizes importance how do people do profession in something system so that explain related activities _ with work (Greenbaum and Kyng , 1991, p.26; Button and Harper, 1992, p.34). Interoperability can also be interpreted as equipment procedures , doctrine and training , and capabilities person , organization , and equipment for operate together by effective (Session, 1993, p.3). Someone who works in something field special must could describe profession this to others, because every the place work is unique so that required interoperability in see organization military and describe something area or operating mandalas (Suchman , 1995, p.60). Interoperability Structural and Semantics Among objects learning and resources power more on the internet pointing to direction semantic web technologies in general and ontologies in particular as provider solution . Difference structure and semantic diversity between ontology need solved for produce Shared ontology that facilitates ability learning object for reused . (Junaedi , 2016, p.3).

Elements and levels interoperability Becomes important in study this because could used as indicator for measure implementation interoperability Among four the unit under study . Distribution a number of element could view and share problem by more arranged . Then despite study tend see how operation executed which
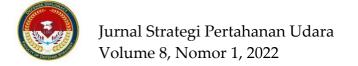
signifies more to level tactical and technological , however the review could starting from _ level strategic and operational .

2.2 Draft Command , Control , Communication , Computer , Intelligence , Reconnaissance and Observation (K4IPP)

In Minister of Defense regulations Republic of Indonesia Number 8 of 2016 concerning Implementation of Special Telecommunications within the Ministry of Defense and the Indonesian National Armed Forces Article 1 paragraph (7) states " Command , Control , Communication , Computer , Intelligence , Reconnaissance and Observation hereinafter called K4IPP is something system that integrates and synergizes elements Command , Control , Communication , Computerization , Information , Observation and Reconnaissance To use increase quality command and control leader Defense / TNI to elements executor nor system weapon by fast and precise in skeleton interest Duty national defense ". In military there is superiors and subordinates , superiors entitled and responsible answer give command and control how far is the command the implemented . along running time , organization more spacious , personnel more many so communication is addition element next . Likewise after _ communication is a computer as technology in support command and control (kodal) . _

2.3 Theory Competence , Communication , Organization and Cooperation _

Scale (in Sutrisno , 2015, p.202) delivered that competence by literally means skills , abilities , and authority . Competence can also be interpreted as something ability for doing or To do something profession or tasks based on knowledge , skills , behavior , and experience for To do something profession or role certain by effective (Wirawan , 2015 and Wibowo, 2014). Competence , according to Prihadi (2004) is also close relation and influence the position occupied someone (roles and responsibilities) answer), correlated with job performance _ it , and can be measured with accepted standards _ as well as could upgraded through training and development . Competence work from aspect formal education , it seems no too
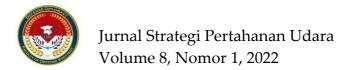
important in push enhancement performance apparatus , while aspect education and training as well experience work enough big hold role important in push enhancement performance employee . (Sumendap , 2015, p.9).

Communication word or communication in language England originated from language Latin communis which means " *same* ", *communico* , *communication, or communicare which means " to make " same " (to make common).* Term first (communist) is most frequent terms as origin the suggestion of the word communication , which is root from other similar Latin words . Communication recommend that something mind , a meaning , or something message embraced by the same (Mulyana , 2005, p.4). Communication is incident conveying human ideas . From understanding this could concluded that communication is a delivery process messages that can be in the form of message information , ideas, emotions , skills and so on through symbol or symbol that can be cause effect in the form of Act behavior done _ with mediamedia certain (Effendy, 2005, p.6).

According to West, Borrill , and Unsworth (1998, pp.1-48), organizations must have three thing . First , work from each element , or even in the smallest scope , that is individual , must no alone , no independent , and must each other coordinated . Second , every member must have specific and specific roles . _ Third , must have destination with those who want achieved . Work same is something the form of social processes in which there is activity specific shown _ for reach destination together with each other help and mutual understand each activity (Abdulsyani , 1994, p.156). Work same arise when people realize that they have the same interests and at the same time have enough knowledge and control to self alone for Fulfill common interests and organization _ is important facts _ in work equally useful (Cooley, in Soekanto , 2012, p.66). Work same in the military world possible occur if there is two one strength _ with other have similarity in problem

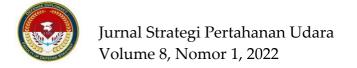security .

2.4   Theory Training and Development

Use term training and development _ _ _ _ put forward by experts , namely Dale Yoder (in Mangkunegara , 2017, p.43) uses term training for employee executors and supervisors . Whereas term development addressed for employee level management . The terms put forward by Yoder are rank and file training, supervisor training, and *management development.* linked with this post that theory the relevant used in the implementation program coaching and training team Sarpur that becomes object from study this , where are the officers in the unit the could categorized as as supervisor training (Dansat) and management training (Pasiops and Pasipers).

of several introduction theory used _ above , the *grand theory* used is draft Interoperability where interoperability will be Becomes point reject study in thesis this . Then as knife analysis and theory supporter from draft interoperability used _ is draft ability *(ability)* means capacity a individual for To do variety Duty in something work (Robbins and Judge, 2009, p.57). Competence Becomes very basic supplies in operate activity man specifically in a assignment . Work same and communication too _ support implementation interoperability . Knowledge that is Information that has been processed and organized for get accumulated understanding , learning and experience _ so that can applied to in profession employee that alone . Skills (*skills)* is ability employee for complete profession with effective and efficient by technique implementation work certain related _ with Duty individual in something organization . Training and development be one _ method for increase capacity individual soldiers involved _ in

interoperability operation .

3.   Method Study

Study this will use method qualitative with as tool operationalization from framework think that has discussed before . Sekaran and Bougie (2013), mention that study with method qualitative could help for think by systematic about aspects in
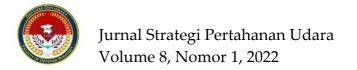
situation certain , give ideas for investigation more continue , and help simplify discussion about characteristics people , events , or the situation that became focus research . Temporary for design , refers to the problem interoperability cross working unit _ same in To do combat SAR operations , there is a gap between normative ideal conditions with what is happening in the field , so that more appropriate use design qualitative verification .

4.   Results and Discussion

The Air Force Special Forces Corps (abbreviated as Korpaskhasau, Paskhas or other designations are Orange Beret troops) is a special force owned by the Air Force, Paskhas is a ground combat unit capable of three dimensions, namely, land, sea and air. Every Paskhas soldier is required to have at least a para-command qualification (Parako) to be able to carry out his duties professionally, then add the ability of the air dimension according to his specialization.

Korpaskhas is tasked with fostering the strength and capability of the Paskhas unit as an air force force to be operationally ready to carry out the seizure of targets and defense of the Air Force's strategic objects, air defense, special operations and special air units in military operations at the discretion of the TNI Commander. Korpaskhas, which is one of the forces of the Indonesian Air Force, has the task of, among others, fostering the ability of units in the ranks, especially in supporting the implementation of air operations. In carrying out its duties, Paskhas has functions that are supported by several capabilities, including the air force capability applied by the Paskhas Matra Detachment.

4.1   Interoperability between the Paskhas Sarpur Team and Combat Aircraft and Helicopter Crews in Support of Combat SAR Operations has not been achieved
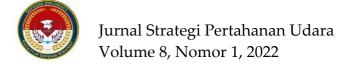
Human Resources (HR) has an important role where HR is the object and subject of the interoperability itself, Then the second is the ability of the Paskhas Sarpur Team Equipment, in addition to HR another important element in an interoperability is the support in the form of equipment, where the capabilities of HR will be tested by the condition of the equipment, the capabilities of HR will certainly be meaningless if the equipment they have does not function or has problems and may not have been equipped with such equipment, then the third, Combat SAR Operation Software.

The Paskhas Combat SAR Team in carrying out their duties, both in operations and training, a soldier who is included in the Indonesian Air Force's Paskhas Sarpur Team must have above average abilities, so it can be assumed that the human resources that are part of the Sarpur Team are qualified human resources. In its implementation, the Sarpur Team will use infiltration and covert insertion methods through various media, both land, sea and air depending on the situation and conditions of the target. High Altitude Low Opening (HALO), High Altitude High Opening (HAHO), Rappeling, Fastrope, Free Jump, diving, sea and land infiltration have become mandatory food for the Paskhas Sarpur Team. However, interoperability is not optimal in terms of human resources and equipment capabilities.

4.2   The Interoperability of the Paskhas Sarpur Team and Combat Aircraft and Helicopter Crews in Supporting Combat SAR Operations is Not Optimal

Interoperability has not been optimally established, namely only through radio verbal communication and limited equipment, but in the future there are still many things that can be developed both in terms of data communication and tactics that will be done. The role of the Paskhas Sarpur Team is very important because it is one of the parts that determines success in search and rescue in the operation mandala and is always in one package with the movement of the helicopter.

Interoperability is still very lacking especially in the context of threats that must direct Rocket and doorgun shots, this can be seen from the exercises that are very rarely carried out, this role not all members of the Paskhas Sarpur Team have implemented and know these tactics.
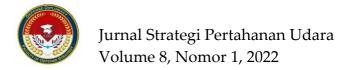
Real steps that can be taken are with measurable exercises, this has been the first time with an outside trainer who has combat experience, but it's a shame that the scheduled training has never been carried out until now. One of the ways to optimize existing equipment is by reviewing how to communicate with the equipment so that they have a common perception.

In the implementation of Combat SAR exercises, there are still many limitations in the dynamics of the exercises that occur. There is a need for more complex dynamics that need to be trained by fighter aircraft and Paskhas personnel in dealing with possible enemy threats that have more modern defense equipment capabilities at this time. Regarding communication, so far what can be done with ground troops is only through voice communication. There is no means of data communication between ground troops and fighter crews, and Sukhoi fighter aircraft do not yet have equipment for identifying ground targets in the form of a targeting pod.

4.3 Efforts Made to Overcome Interoperability Constraints Between the Paskhas Sarpur Team and Combat Aircraft and Helicopter Crews in Support of Combat SAR Operations

In overcoming obstacles, there are several efforts that have been made, namely:

a. Carry out training in accordance with the existing syllabus.

b. Hold discussions with other combat units that have more complete literature for the development of training patterns and techniques in carrying out these operations.

c. Make changes or additions to software at the unit level to develop training patterns that have been obtained.

d. Submit to the top command the hardware requirements needed to support the implementation of training missions or operations.

Improving the quality and quantity of training is needed to improve the capabilities of all parties involved. Because as is known, the implementation of the Rescap mission does not only involve Paskhas and Combat Aircraft but also involves other units, for example ISR, AOC and others.

So far, RESCAP exercises have been trained at the time of unit training activities at the Airbase level or at the Koopsau level or during the implementation of MOT. Thus, the number of exercises carried out is still very limited. A continuous and programmed training is needed to improve the capabilities of all parties. At this time, Item Development from Diskomlek is developing a Data Link system with the name CTDLS. Where this system has been applied to Boeing Intai aircraft and will be developed in the future for the creation of tactical data communication on all TNI defense equipment (Land, Sea and Air). This is also in line with the concept of Network Centric Warfare which is being developed by the Indonesian Air Force.
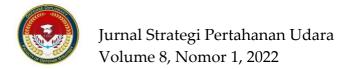
Interoperability has not been achieved optimally because communication is only in the form of verbal via radio and limited equipment so that currently there is no data communication capable of achieving interoperability. The Paskhas Sarpur Team and Sukhoi Combat Aircraft Elements have not been able to communicate data in Real Time which can support the creation of Interoperability in Combat SAR operations.

The current condition is that the Paskhas Sarpur Team has not been able to communicate digital data with elements of fighter aircraft, so interoperability will not be achieved. Interoperability capabilities have not reached the standards required to support Combat SAR Operations, including aspects of Interoperability capabilities with elements of RESCAP, RESCORT, HELI CSAR.

The ability or competence of the Paskhas Sarpur Team in supporting the Sarpur Operations has not been optimal, which has resulted in not achieving interoperability of the Paskhas Sarpur Team with elements of RESCAP, RESCORT and HELI CSAR. This element involves four units, namely Air Squadron 11 Sukhoi fighter aircraft as RESCAP (Rescue Combat Air Patrol) aircraft, Air Squadron 21 Super Tucano EMB-314 fighter aircraft as RESCORT (Rescue Escort) aircraft, Air Squadron 8 CSAR Helicopters and Denmatra 2 Paskhas as the Paskhas Sarpur Team connected with doctrine and the theory that interoperability between RESCAP fighter elements, RESCORT fighter elements, CSAR helicopter elements and the Sarpur Team has not been achieved. Interoperability between the Paskhas Sarpur Team and RESCAP aircraft elements in supporting Combat SAR operations has not been optimal because so far all that can be done with ground troops is only through voice communication. It does not yet have a means of data communication between ground troops and fighter aircraft.

Limited medical capabilities/TCCC (*Tactical Combat Casualty Care)*, *Water Rescue*, *Urban Rescue*, *Vehicle Rescue* and *Extrication* due to limitations in training and development of these capabilities which ultimately affects interoperability between the Paskhas Sarpur Team and elements of RESCAP aircraft, RESCORT aircraft and HELI CSAR aircraft are not optimal. With the limited equipment conditions, the interoperability will not be optimal. The limited condition also exists in the limited software currently available, namely there is no Technical Instructions for Combat SAR Operations based on the 2019 Swa Bhuwana Paksa Doctrine so that interoperability has not been achieved because there is no conformity to procedures, organizations and methods in the implementation of Combat SAR operations.

Efforts are being made to create high interoperability between elements of fighter aircraft and the Paskhas Sarpur Team, it is necessary to carry out training in stages, stages and continuously so as to create a common vision and the same way of fighting, proposing the equipment needed in the implementation of the SARPUR mission, for example data links between troops. ground by plane, anti-jamming

communication equipment, conducting exercises and Subject Matter Expert Exchange (SMEE) with the military of other countries who have experience in carrying out Combat Search and Rescue and the need for more complex dynamics that need to be trained by fighter aircraft and Paskhas personnel in dealing with the possibility of the threat of enemies who have more modern defense equipment capabilities at this time. Increased training by going directly to the field in the form of simulation of Combat SAR operations between the Paskhas Combat SAR Team and the Sukhoi RESCAP Combat Aircraft Crew in real terms with more complex training dynamics and approaching the actual Combat SAR operations supported by data link and anti-jamming communication equipment.

Carry out exercises in accordance with the existing syllabus of proficiency, hold discussions with other combat units that have more complete literature for the development of training patterns and techniques in carrying out these operations, make changes or additions to software at the unit level to develop training patterns that have been obtained and submit to the municipality the hardware requirements needed to support the execution of the training mission or operation. Efforts have been made in relation to training, courses and optimizing existing equipment, however, training involving trainers from abroad who are experienced in Combat SAR operations is the first time. In order to create interoperability, there is a need for a special program for Combat Search and Rescue Operations training with increased training intensity so that they can operate together effectively.
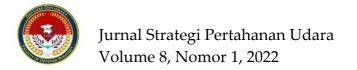
5. Conclusion

From the results obtained in this study, several conclusions can be summarized.

a. Interoperability between elements of RESCAP fighter aircraft, elements of RESCORT fighter aircraft, CSAR helicopter elements and the Paskhas Sarpur Team has not been achieved. To achieve this interoperability, it is

necessary to achieve an ideal condition between the Sarpur Paskhas Team and the Combat Aircraft and Helicopter Crews, namely having communication equipment with the Data Link system so that data communication is created for all defense equipment.

b. Interoperability between elements of RESCAP fighter aircraft, elements of RESCORT fighter aircraft, elements of CSAR helicopters and the Sarpur Paskhas Team is not yet optimal, such as communication only via radio and limited equipment, does not yet have a means of real time Data Link communication between ground troops and aircraft elements. There is no clear organizational structure in the implementation of the RESCAP mission, and there is no complete hardware to support the RESCAP mission for both fighter aircraft and Paskhas personnel. The intensity of Combat SAR training between Paskhas Combat SAR Teams, Combat Aircraft Crews and Helicopters is still lacking. There is no Technical Instructions for Combat SAR Operations based on the 2019 Swa Bhuwana Paksa Doctrine, the HR factor where personnel with very limited GFAC capabilities, lack of references, inadequate equipment and infrastructure and not fully supported.

c. Efforts made to overcome interoperability constraints include optimizing training in accordance with the syllabus of proficiency with joint training with the Air Squadron, holding discussions with other combat units that have more complete literature for the development of training patterns and techniques in carrying out these operations.

To improve interoperability between the Paskhas Sarpur Team and elements of RESCAP fighter aircraft, elements of RESCORT fighter aircraft, elements of CSAR helicopters in Combat SAR operations, are as follows:

a. Improving the quality and quantity of training is needed to realize the interoperability of all the elements involved.

b. Improve the components of education, equipment and infrastructure that are compatible among the elements involved in Combat SAR operations, so that interoperability can be realized during Combat SAR Operations.

c. Improving the quality of education in Specialized SAR Combat, both in terms of material and students so that it can produce quality Paskhas Combat SAR personnel such as the USAF Pararescue "PJ" standard.

d. Completing the facilities and infrastructure as well as equipment for the personnel of the Paskhas Combat SAR Team that are compatible with the main defense equipment for the RESCAP fighter aircraft element, the RESCORT fighter aircraft element, the CSAR helicopter element, the AEW&C aircraft element, the UAV/UCAV aircraft element, the transport aircraft element and the tanker aircraft element so as to realize interoperability in the implementation of Combat SAR operations.

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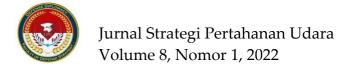
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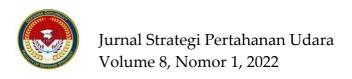
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