
| RESEARCH ARTICLE

Strengthening Military Defense Resources to Non-Military in Facing Nuclear Emergencies to Support National Defense

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| ABSTRACT

Indonesia has the potential for a nuclear emergency, so it is necessary to prepare resources to deal with nuclear emergencies to minimize losses. A nuclear emergency caused by a nuclear reactor accident is a non-military defense sector as the main component supported by other elements of the nation's power. Nuclear Biology and Chemical Company of the Indonesian Armed Forces Army (*Kizinubika*) is another element of the nation's power that provides reinforcement in non-military defense in the face of nuclear emergencies. The purpose of this study is to strengthen the *Kizinubika* resources for the Nuclear Energy Supervisory Agency (*Bapeten*) and the Directorate for the Management of Nuclear Facilities at the National Research and Innovation Agency (*DPFKN-BRIN*) in dealing with nuclear emergencies in order to support national defense. This type of research is qualitative by using literature study, observation, and interview methods. Internal resource criteria are determined based on the Resources Based View (RBV) theory. The results of the study in the form of recommended resources in strengthening the *Kizinubika* against *Bapeten* and *DPFKN-BRIN* in the form of; (1) The use of the *Kizinubika* facility as a joint training facility and infrastructure; (2) The use of special equipment *Kizinubika* in support of nuclear emergency response; (3) *Kizinubika*'s strategic location close to *DPFKN-BRIN* supports speed in emergency response; (4) Use of *Kizinubika*'s Human Resources through joint training in increasing the quantity and quality of training; and (5) *Kizinubika*'s internal organizational relations support the task of dealing with nuclear emergencies.

| KEYWORDS

Nuclear Emergency, RBV, *Kizinubika*, *Bapeten*, *DPFKN-BRIN*

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1. Introduction

The threat of radioactive hazards originating from nuclear has the potential to cause a nuclear emergency in Indonesia. One of the potentials comes from the *DPFKN-BRIN*, which has a nuclear reactor facility with a power of 30 MW and radioactive waste storage throughout Indonesia, which is located in the area of the Center for Science and Technology Research South Tangerang city, Banten province. Indonesia needs to implement the right strategy to prepare a defence system that has reliable capabilities and strengths in dealing with nuclear emergencies. One of the efforts that need to be made is the preparation of defence resources that have capabilities in the field of nuclear emergencies. The resources needed are physical, human resources, organizational resources.

Indonesia's defense system is a universal defense system. In the universal defense system, efforts to implement national defense are carried out by involving and integrating all components of the nation, including military, non-military and other components of the nation, so as to produce a strong national defence. The synergy between military defense and non-military defense to work together in dealing with various forms of threats, both military, non-military, and hybrid threats, is the key to success in national defense.

State defense places the military element in facing threats with a military dimension and places non-military elements in the face of threats with a non-military dimension. In military defense, the Indonesian national army has a unit in charge of nuclear emergencies, namely the Indonesian National Army's Army Nuclear Biological and Chemical Engineering Company. In non-military defense, the ability to deal with nuclear emergencies is owned by the Nuclear Energy Supervisory Agency (*Bapeten*) and the Directorate for Management of Nuclear Energy Facilities at the National Research and Innovation Agency (DPFKN BRIN). The synergy between military and non-military defense is needed to create a state defense that is more prepared to face the threat of a nuclear emergency. In the face of general-level nuclear emergencies, defence resources are not owned by state institutions in charge of nuclear, but resources are spread across various ministries and state institutions. This condition is addressed by involving the active role of all stakeholders according to their duties and functions with the concept of synergy in order to achieve common goals.

2. Literature Review

2.1. Management

Management is the science of managing well-owned resources in order to achieve organizational goals. According to Terry (1958) in the book *Principles of Management* (Sukarna, 2011) states that "management is the accomplishing of a predetermined objective through the efforts of other people". Management is the achievement of the goals that have been set through or together with the efforts of others. In a smaller scope, management has a branch of science in the form of defense management. Defense management is a discipline that deals with the success or failure of a country to manage its national resources to serve as a national power, using managerial methods, from planning to winning wars. (Supriyatno & Ali, 2019). Countries that can properly manage defense resources will be able to maintain the existence of that country—another branch of management science in strategic management. Strategic management is the art and knowledge of formulating, implementing, and evaluating cross-sectoral decisions so that the organization can achieve its goals. (David, 2012). The formulation of strategic management refers to the realization of the chosen strategy to achieve the objectives faced with the existing conditions and situations. In this study, the application of strategic management to planning produces the chosen strategy in dealing with existing problems. The selected strategy was derived based on an analysis of internal and external factors that affect the synergy in the utilization of the resources of the Indonesian Army Nuclear Biology Chemical Engineering Company with *Bapeten* and the Directorate of Management of the BRIN Nuclear Facility.

2.2 Resources Based View (RBV) Analysis

RBV analysis is a classic approach in strategic management related to competency and resource issues. RBV analysis is used to determine the internal factors that affect the organization. Barney (1991) states that the success of an organization is determined by internal resources, which are grouped into 3 categories: (1) Physical resources include all the physical technology used in a firm. This includes a firm's plant and equipment, its geographic location, and its access to raw materials; (2) Human resources include the training, experience, judgment, intelligence, relationships, and insight of individual managers and workers in a firm; and (3) Organizational resources include a firm's formal reporting structure; its formal and informal planning, controlling, and coordinating systems; its culture and reputation; and informal relations among groups within a firm and between a firm and those in its environment.

The resource theory proposed by Barney (1991) becomes the basis for determining the criteria for the resources available in the Indonesian Army Nuclear Biology Chemical Engineering Company. However, not all of the sub-criteria that exist in the existing criteria are used as the basis in this study. The sub-criteria that the researchers chose in this study were as follows: (1) Physical resources consist of: facilities, equipment, and location; (2) In human resources in the form of training; dan (3) On organizational resources in the form of cooperative relationships between groups in units.

3. Methodology

This study used qualitative research methods. Qualitative research emphasizes the form of understanding that is comprehensive and cannot be separated so that qualitative researchers will not determine their research only based on research variables, but the overall social situation under study, which includes aspects of places, actors, and activities that interact synergistically (Sugiono, 2013). The researcher uses qualitative research methods because the aim of the researcher is to analyze the facts in a precise and structured manner.

3.1 Data Collection Techniques

This study's data collection techniques were carried out through interviews, observations, literature studies, and questionnaires. The interview is an event or a process of interaction between the interviewer and the source of information or the interviewee (interviewee) through direct communication about an object under study and has been previously designed. (Sugiono, 2013). Observation is "systematic observation and recording of the elements that appear in a phenomenon on the object of research" (Widoyoko, 2014). Literature studies are carried out by searching for data and information indirectly through various reliable data

sources so that it will provide a clearer picture of how the topic was discussed and understood by previous authors or researchers. (Semiawan, 2010). This assessment is based on the subjectivity of resource persons who are competent in their field.

3.2 Data Analysis Techniques

Criteria Internal factors are determined based on the RBV theory. The use of RBV theory includes resources in the fields of physical resources, human resources, and organizational resources. Based on the resource criteria that have been determined based on the RBV theory, then the data is analyzed in depth based on the sources of existing theories and regulations.

4. Results and Discussion

4.1 Kizinubika Facility Resources

Kizinubika has adequate facilities to support preparedness. The existing facilities are housing facilities, offices and training facilities which have a base area of 10 hectares. *Kizinubika* is a knighthood where offices and housing become one area that provides housing facilities for its members. The facilities owned by *Kizinubika* consist of:

- a. Office facilities in the form of the Company Commander's office.
- b. Warehousing facilities include maintenance warehouses, ammunition depots, weapons warehouses, and alsus warehouses.
- c. Public facilities include meeting buildings, prayer rooms, polyclinics, cooperatives, complex roads, waterways, razor wire fences, water installations, electrical installations, generator houses, and water pump houses.
- d. The training facilities include the field, classrooms and simulation rooms.
- e. Sports facilities include a volleyball court and a futsal court.
- f. Maintenance facilities include garage, vehicle wash, workshop,
- g. Special facilities include nuclear laboratories, biological laboratories, chemical laboratories, disposal rooms, and decontamination stations.
- h. Housing facilities include barracks and soldier housing.

The facilities owned by *Kizinubika* can be used as facilities and infrastructure for joint training with *Bapeten* and DPFKN BRIN. The use of the *Kizinubika* facility has been carried out with *Kizinubika* in 2006 and 2017. The *Kizinubika* facility has a specificity when compared to military facilities in general in the form of a simulation room. The simulation room is used as a perception room that resembles the actual conditions in the event of an emergency. Through this room, trainees can feel a simulated nubika attack in a controlled state. *Kizinubika's* facilities are complete in the form of facilities and infrastructure that support office tasks, training, and housing. In general, the facilities owned by *Kizinubika* can support the unit's operational readiness.

4.2 Kizinubika Equipment Resources

Kizinubika has quite adequate equipment in terms of quantity and quality. Existing equipment can be used to support Nubika personnel in carrying out nuclear emergency response tasks. Materials prepared for nuclear emergencies are shown in table 4.1. In addition to materials prepared in preparedness, *Kizinubika* also has special materials prepared in the event of an escalation of nuclear emergencies.

Table 4.1 Nuclear Preparedness Materials *Kizinubika*

No	Equipment Name	Amount	Unit	Description
1.	Protective clothing	31	pair	Ready
2.	Protective mask	31	unit	Ready
3.	Gloves	31	pair	Ready
4.	Shoe protector	31	pair	Ready
5.	Decotruck + Equipment	1	unit	Ready
6.	Deco Jeep + Equipment	1	unit	Ready
7.	RDS Decontamination Material	2	galon	Ready
8.	Stretcher	2	buah	Ready
9.	Breathing Apparatus	2	pair	Ready
10.	CBRN Investigation special vehicle + Equipment	1	unit	Ready
11	Nuclear disposal device	1	unit	Ready
12	Long clamping pliers	1	unit	Ready
13	Personnel vehicle	1	unit	Ready
14	Identifinder Nuklida	2	unit	Ready

15	Personal Dosimeter	31	unit	Ready
16	Handy Talky (HT)	5	unit	Ready

Source: *Kizinubika*, 2021

The *Kizinubika* equipment was used in joint training activities in dealing with nuclear emergencies organized by *Bapeten* and DPFKN BRIN. The nubika equipment used includes analysis and news center equipment, detection equipment, decontamination equipment, and protection equipment. The analysis and news center equipment is in the form of an investigation car equipped with meteorological equipment and computer equipment used to make predictions of the spread. Detection equipment is used to detect the presence of radioactive activity. Decontamination equipment in the form of decon cars can be used to decontaminate humans and equipment that has the potential for nuclear contamination, including emergency personnel. Protective equipment, protective clothing, protective shoes, gloves, and breathing apparatus are used to protect personnel and victims.

The equipment owned by *Kizinubika* is special equipment in the emergency sector, complete with sufficient numbers to support *Kizinubika's* personnel in carrying out the task of dealing with nuclear emergencies. The condition of operational readiness of nubika's equipment is currently 70%. The equipment owned by *Kizinubika* is quite complete when compared to the equipment of the *Bapeten* Emergency Response Unit, which has been stipulated in the Regulation of the Head of the Nuclear Energy Supervisory Agency Number 1 of 2015 concerning Management of the Emergency Response of the Nuclear Energy Supervisory Agency article 15 in the form of 1) Communication equipment; 2) Environmental radioactivity monitoring equipment, data processing and transmitting systems; 3) Radiation detection equipment; 4) Radioactive source identification equipment; 5) Nuclear Security detection equipment; 6) General safety equipment and materials and personnel radiation protection; 7) Equipment and decontamination materials; and 8) Supporting equipment.

Nubika equipment is special equipment needed in dealing with nuclear emergencies. The need for *Kizinubika* equipment has been written down in the Contingency Planning document in the face of the Setu Nuclear Emergency Threat, South Tangerang City, Banten Province. Equipment needs have been determined in the form of anti-radiation equipment, radiation measuring equipment, decontamination equipment. Anti-radiation equipment to protect the body from radiation exposure, this tool consists of protective clothing, gloves, protective shoes, masks, and breathing apparatus. The measuring instrument is used in the measurement of radiation and influencing factors in the contaminated environment. This tool consists of a set of special investigation vehicles, personal dosimeter equipment, Nuclide Identifier. The decontamination equipment used is a Decotruck and DecojEEP Vehicle.

4.3 Kizinubika Location Resources

Kizinubika is a unit located on Jl. Cigra, Cogreg, Parung District, Bogor Regency, West Java Province. Nubika's base is at 6° 25' 45" south latitude and 106° 41' 50" east longitude (Google Earth, 2019). The location of the *Kizinubika* base has a distance of 11.8 km to DPFKN BRIN, which is connected by road access that supports personnel and material mobility. Travel time from *Kizinubika* base to DPFKN BRIN is approximately 35 minutes (between 20 minutes to 50 minutes) is shown in Figure 4.1.

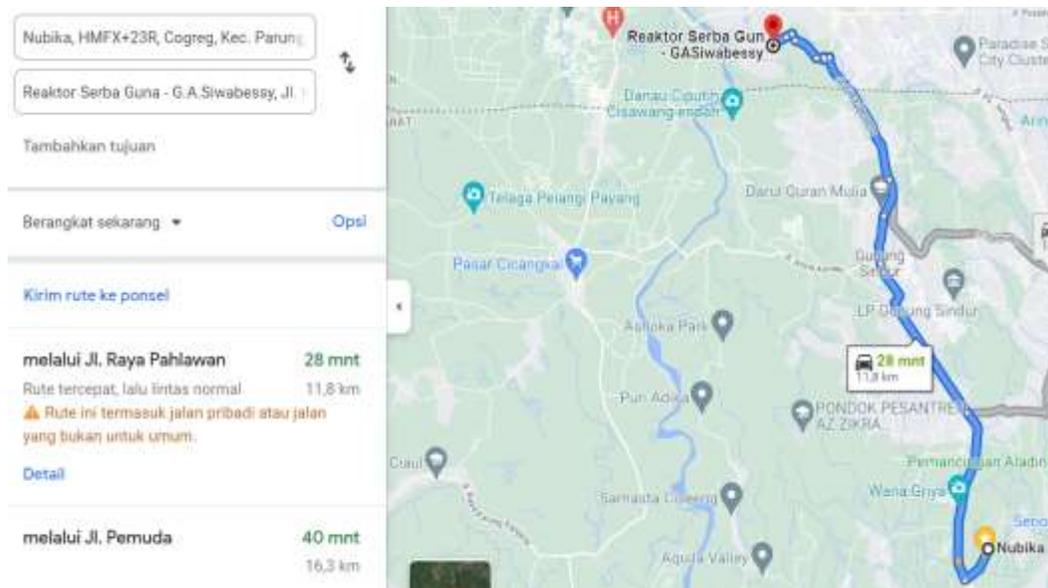


Figure 4.1 Distance from *Kizinubika* to DPFKN BRIN
Source: Google Maps, 2019

The strategic location of the *Kizinubika* base is close to the *DPFKN-BRIN* with a distance of 11.8 km with a travel time of approximately 35 minutes, allowing for fast movement with easy access to the location. Access is wide enough for large vehicles to go to the highway. The current road access is quite good and can be passed by vehicles owned by *Kizinubika*. Access roads that are traversed by *Kizinubika* from the base to the *DPFKN-BRIN* facilities in the form of Cigra Street, Cogreg Street, Pahlawan highway, Serpong highway, and Puspipetek Street. At certain times, the passed road has increased use due to educational facilities such as SDN Cogeg 2 on Jalan Pahlawan, SMK Bistek Cibinong on Pahlawan highway, and Prumpung Market between Pahlawan highway and Pembangunan highway. However, using the siren owned by the nubika vehicle can be overcome. The location of *Kizinubika*, which is close to the *DPFKN-BRIN*, provides support from *Bapeten* and *DPFKN-BRIN* to *Kizinubika* as a priority unit in the event of a nuclear emergency.

4.4 *Kizinubika* Training Resources

Kizinubika has trained human resource capabilities. This ability is acquired through well-programmed practice. Training is carried out every year from individual training to the unit level. Individual-level training is in the form of general basic individual training, military physical readiness test, general individual skill test, individual team training, team position skill test, platoon position individual training, platoon position individual skill test, company position individual training, and individual position skill test company. Exercises closely related to nuclear emergency response capabilities organized by *Kizinubika* in 2021 are shown in the table. 4.2

Table 4.2 Exercises and Tests in 2021

No	Exercise Type	Amount of Perpetrator	Amount of organizer	Total number
1	CBN protection tactical training	30	20	50
2	CBN investigative tactical training	12	20	32
3	CBN decontamination tactical training	48	20	68
4	Squad level combat readiness test	60	0	60
5	CBN Platoon tactical training	68	0	68
6	CBN Platoon combat ready test	68	0	68
7	CBN News and analysis center technical training	48	20	68
8	CBN detection/identification tactical training	48	20	68
9	CBN disposal technical training	48	20	68
10	CBN emergency training	34	20	54
11	CBN company technical training	69	0	69
12	CBN company tactical training	69	0	69
13	CBN company combat ready test	69	0	69

Source: *Kizinubika*, 2021

The *Kizinubika* unit has trained human resources because it has carried out training according to the task with a solid training intensity every year. Exercises are held according to the schedule and training program created. Training is carried out from the individual level to the unit level in order to maintain and improve the technical and tactical capabilities of personnel and unit organizations in carrying out their duties. The exercises carried out in maintaining and improving technical capabilities are in the form of technical training for the center for analysis and reporting, disposal exercises, and technical training for the nubika company. Exercises used to maintain and improve capabilities in organizational units faced with actual (tactical) fields include protection, investigation, decontamination, detection/identification, emergency, training and testing at the team, platoon, and company level.

Strengthening the *Kizinubika* training for *Bapeten* and BRIN's DPFKN is in order to improve the quality and quantity of joint exercises in increasing readiness to face nuclear emergencies. *Kizinubika* conducted joint exercises with *Bapeten* and BRIN's DPFKN. Exercises are carried out to maintain and improve each other's capabilities in dealing with nuclear emergencies. The joint exercise aims to test each of the SOPs that are owned to create harmonious coordination. This alignment is important in order to create a conducive coordination path. In addition, the exercise is also to measure the resources owned by each agency so that resource mapping can be carried out in the face of a nuclear emergency.

Bapeten as the organizer of nuclear emergency training activities at the national level, organizes activities every 4 years. In addition to the supervisory function, *Bapeten* also acts as an Emergency Response Unit in the event of an emergency caused by a special event. BRIN's DPFKN carries out nuclear emergency preparedness and response training activities in accordance with the mandate of Government Regulation Number 54 of 2012 concerning Security and Safety of Nuclear Installations and Regulation of the Head of the Nuclear Energy Supervisory Agency Number 1 of 2010 concerning Preparedness and Countermeasures for Nuclear

Emergencies. Based on this regulation, BRIN's DPFKN is required to conduct nuclear emergency preparedness and response exercises at the facility level at least once a year, at the regional level once in 2 years, and at the national level once in 4 years.

4.5 Kizinubika's Internal Organizational Cooperation Resources

Based on the results of observations and interviews from resource persons, information was obtained that the organizations in *Kizinubika* worked well together in supporting the unit's tasks. Organizations that are on duty outside the unit will be assisted by other organizations in the unit. Each unit helps each other and works well together. In addition to conducive internal organizational factors, it is also supported by the *Kizinubika* organizational regulations, which regulate the coordination line according to the command line. Good internal cooperation within the *Kizinubika* organization is very instrumental in the success of the task. The organization of the nubika company assignment in the first stage consisted of 1 platoon consisting of 31 personnel from the formed organization. The organization formed is personnel who are prepared in contingency alert. The task force from *Kizinubika* in the assigned area will also be reorganized within the task force in accordance with the demands of the task.

5. Conclusion

Based on the results of the discussion of the research data, it can be concluded that the strengthening of defense resources by *Kizinubika* to *Bapeten* and DPFKN BRIN can be done through:

1. Use of the *Kizinubika* Facility as a means and infrastructure for joint training.
2. Use of *Kizinubika*'s special equipment to support nuclear emergency response.
3. *Kizinubika*'s strategic location close to DPFKN-BRIN supports speed in emergency response.
4. Use of *Kizinubika*'s Human Resources through joint training in order to increase the quantity and quality of training in maintaining and enhancing capabilities in dealing with nuclear emergencies.
5. Good internal organizational relations of *Kizinubika* in supporting the task of dealing with nuclear emergencies.

6. Recommendation

It is necessary to research factors in resources that have not been discussed in this study in accordance with the theory proposed by Barney (1991). On physical resources in the form of technology. In human resources in the form of schools, experiences, assessments, relationships between individuals, and insights. In the field of organization in the form of planning, cooperation with external organizations, information systems, and control systems.

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