



# The Effect of Management of Service Strategies on Quality of Public Satisfaction Survey on Nuclear Emergency Response at RSG-GAS Serpong, TRIGA2000 Bandung and Kartini Yogyakarta Research Reactor

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## ABSTRACT

A study has been carried out to contribute to Indonesia's disaster management system for nuclear emergency preparedness and response. This study is very important to improve nuclear emergency preparedness and responses to local authorities who have the potential risk of a nuclear disaster arising from an emergency nuclear research reactor. The difference in reactor power provides an overview of the different potential hazards. This paper analyzes the nuclear emergency response plan of the Indonesian nuclear research reactor. They are RSG-GAS (30 MWth) in Serpong, TRIGA2000 (2 MWth) reactor in Bandung, and Kartini reactor (100 KWth) in Yogyakarta. A good quality management strategy can contribute to people's satisfaction compared to current international standards. This study concludes that the potential danger of the reactor is in line with the power and characteristics of the reactor. Among the three, RSG-GAS has the highest potential hazard with a potential impact of up to 5 km, followed by the TRIGA2000 reactor with a potential impact of up to 1 km, and the least is the Kartini reactor with a potential impact of up to 200 m. The operation concept used in the contingency plan is in line with international standards. This research found that a good service strategy management plan is not equipped with a reference value for every protective action taken will cause community satisfaction will not be of good value. Therefore, reviews and updates are needed to improve the plan. Another challenge found in this study, one of which is the availability of Iodine Thyroid Blocking Agent (KI pills), also needs to be solved so that it is prepared for an effective response.

**Keywords:** Management of Service Strategies, Quality of Public Satisfaction

**JEL Classifications:** L1, Q54

## 1. INTRODUCTION

Public services can be interpreted as providing services (serving) the needs of many people or communities who have an interest in the organization in accordance with the basic rules and procedures that have been determined. As stated earlier that government is essentially a service to the community as revealed by Hertati (2015). Furthermore Hertati (2016) states that the public has an obligation and responsibility to provide good and professional services as well as in general. Syafarudin and Sudiarditha (2018) states that public

services are activities carried out by a person or group of people on the basis of material factors through certain systems, procedures and methods in an effort to meet the interests of others in accordance with their rights. Then Syafarudin and Mulyana (2019) states that the purpose of public services is to prepare those public services that are desired or needed by the public, and how to state correctly to the public about their choices and how to access them that are planned and provided by the government (Flynn et al., 2010).

Hertati (2015) states that emergency response plans must carry out communication and outreach with a good strategy. Furthermore

Hertati (2016) states that community satisfaction is absolutely a factor in increasing business. Partnership ties with communities that are built in peaceful and secure conditions require good quality service from government security forces (Coyne, 1989). Then Hertati (2019) states that without that, no matter how good the quality of security by a good and well-integrated apparatus will only be in vain. Based on Law No. 10 of 1997 concerning nuclear energy, the use of nuclear energy is activity related to nuclear energy which includes research and development, mining, manufacturing, production, transportation, storage, transfer, export, import, use, decommissioning and management of radioactive waste to improve human's welfare (The Republic of Indonesia, 1997), According to Government Regulation No. 33 of 2007 concerning Safety of Ionizing Radiation and Security of Radioactive Sources and Government Regulation No. 29 of 2008 concerning Licensing for the Use of Ionizing Radiation Sources and Nuclear Materials, nuclear energy is any form of energy released from the core transformation process including energy derived from ionizing radiation sources. In the regulations, the use of nuclear energy in Indonesia is grouped into two fields of utilization The Republic of Indonesia (2008) they are: (a) Utilization in the field of Nuclear Materials and Installation, for example: nuclear reactors, facilities used for purification, conversion, enrichment of nuclear materials, nuclear fuel fabrication and/or reprocessing, and facilities used to store spent fuel and nuclear fuel; and (b) Utilization in the field of Radiation and Radioactive Source Facilities, for example: X-ray, teletherapy, brachytherapy, CT scan, PET-scan, nuclear medicine and utilization of radiation sources for industry, such as: irradiators, gamma cameras, gauging, well-logging, and so on.

Those uses are regulated by the nuclear energy regulatory agency (BAPETEN) at the national level, as well as by the international atomic energy agency (IAEA) at the international level. For the use in nuclear reactors, Indonesia has three nuclear research reactors, namely: (a) Multipurpose reactor - GA. Siwabessy (RSG-GAS) in Serpong with reactor power of 30 MegaWatt thermal (MWth); (b) TRIGA2000 reactor in Bandung with reactor power of 2 MWth; and Kartini Reactor in Yogyakarta with reactor power of 100 KWth. The reactors are used for research and produce radioisotopes. Besides their usefulness, nuclear reactor also has an inherent risk due to its radiation hazard. Therefore, to ensure the safety of the reactor workers and community around, nuclear reactor should be designed, built and operated in accordance with the national regulations as well as international standards relating to the safety and security of nuclear installations. The objective is to prevent the likelihood of nuclear emergency or as part of risk management effort aiming to manage its radiation hazard. The risk management effort, as discussed above, are in line with the disaster management paradigm that has been shifted from a responsive approach to a proactive approach. Quoting the UN-ISDR (2009) terminology, disaster is a serious disruption of the functioning of a community or a society that causes widespread losses of human life, material, economic or environment and beyond the capability of the community to overcome by using their own resources. Whereas according to Law No. 24 of 2007 concerning Disaster Management, disasters are events or series of events that threaten and disrupt the lives and livelihoods of people caused by natural and/or non-natural factors and human

factors resulting in human casualties, environmental damage, property losses, and psychological impact (The Republic of Indonesia, 2007).

According to Maarif (2012) disaster risk involving three factors, namely disaster risk hazard, vulnerability and capacity (Maarif, 2012) By using this approach into risk management at a nuclear reactor: (a) Disaster risk hazard is any incident that might endanger workers and the community around the reactor; (b) Vulnerability is unprepared condition or inability of the reactor operators, the nuclear area manager, local government and the community in responding to nuclear emergency; and (c) Capacity is a condition of readiness/capability of the reactor operator, the nuclear area manager, local government and the community affected in responding to nuclear emergency. An effort to build nuclear emergency preparedness and response capacity is through developing a contingency plan in pre-disaster stage. Nuclear emergency might be prevent, however, it is impossible to eliminate the nuclear emergency risk at a nuclear reactor. Therefore, the capacity to respond to the emergency must be possessed. Thus, stakeholders in Serpong, Bandung and Yogyakarta developed contingency plans to deal with the emergency arising from nuclear research reactor within their region. The Directorate of Preparedness-BNPP first facilitated the development in 2013 when drafting a nuclear contingency plan in Setu, South Tangerang, Banten (RSG-GAS). Then, in 2014, 2015 and 2016, the Directorate of Technical Support and Nuclear Emergency Preparedness, BAPETEN continue the facilitation on developing nuclear contingency plans in Bandung, West Java (TRIGA2000 Reactor), and nuclear contingency plan of the Kartini nuclear reactor, Yogyakarta.

The contingency plans address the response and action plan among reactor emergency response organizations (reactor operators) and emergency service organizations from outside reactor (emergency service organizations at local, provincial and/or national level, such as Fire Brigade, Police and Ambulance). Therefore, this paper aimed to analyze the nuclear emergency response plans from the three nuclear research reactors, namely RSG-GAS in Serpong, TRIGA2000 reactor in Bandung and Kartini reactor in Yogyakarta which are contained in the nuclear contingency plans document. The analysis is important since it is expected to contribute in an effort to enhance the nuclear emergency preparedness and response of the local authorities who have potential risk of nuclear disaster arising from nuclear research reactor emergency. The study used a descriptive, analytical and qualitative method. Primary data was obtained through researchers experience and direct observation in the research reactors operation practices in BATAN and nuclear regulation in BAPETEN, as well as through forums group discussion (FGDs) with respondents from relevant nuclear emergency response institutions. The FGDs were held from 2013 to 2016 within the framework of developing nuclear contingency plans facilitated by BNPP and BAPETEN. The notes and feedback during discussions at the meetings/FGDs are primary data that supports this study. Other secondary data are legislations, international standards, institutional guidance, and other literature that supports the study. The stage of the study is consist of collection of literature and supporting information, analysis, discussion, and preparation of the report.

As a first step, the nuclear contingency plan documents from each research reactor was analyzed to assess the connection between the reactor power and the concept of nuclear emergency response. The study continued with a literature study on applicable international standards to analyze the conformity of the concept of nuclear emergency response used with the concept used in the international standards (IAEA). To complete the study, an analysis of the implementation of nuclear contingency plans in each region was also carried out.

The main points discussed in the study are nuclear emergency response plan in the RSG-GAS in Serpong, TRIGA2000 reactor in Bandung and Kartini reactor in Yogyakarta, analysis of the nuclear reactor's emergency response plan, identification of challenges and finally analysis of the implementation of the nuclear contingency plans. 3.1 Nuclear Emergency Response Plan in Setu, Tangerang Selatan (RSG-GAS) RSG-GAS is located in Serpong Nuclear Area, Center for Research in Science and Technology (Puspiptek). Based on its hazards assessment, RSG-GAS is include to level two radiological hazard category. It means that incidents occur in the reactor might increase the radiation dose for community outside the reactor, so emergency response measures will be needed to be taken outside the reactor.

Based on nuclear contingency plan in Setu, South Tangerang City, Banten document (2013) (BNPB, 2013), the worst nuclear scenario accident is triggered by reactor operating system failure due to five nuclear fuel elements melting in the reactor core. The safety systems to stop the reactor operation automatically (system scram) fail, resulting in severe accidents and release of radioactive substances from the reactor core to the chimney then to the environment. Based on analysis of its potential hazard, the release is estimated to reach a 5 km radius from the reactor (in fact, it must be proven by the environmental radiation measurements).

Based on these analysis, the emergency response measure are focussing on: sheltering (stay in a house or a closed building until evacuation time), evacuation, administration of potassium Iodide antidote tablets (KI), decontamination of victims and contaminated equipment, and prohibiting consumption of contaminated water and local food products that are set up to a 5 km radius from the reactor. The most affected aspects are: the population (sheltering or evacuating residents), the land transportation routes (re-routing of transportation routes) and the environment (environmental contamination).

To coordinate the nuclear emergency response measures, emergency response sectors were established, namely the command and control sector, the evacuation sector, the social and logistics sector, the security sector, and the health sector. Since the specific hazard is nuclear radiation, the nuclear sector is also established. The command and control sector consists of decision-making agencies, namely local disaster management agency (BPBD) of South Tangerang, Provincial BPBD of Banten, BATAN and BAPETEN. The main goal of this sector are to establish command posts for the management, command and control, as well as for coordination of nuclear emergencies response measures. Other sectors consist of relevant ministries/

institutions and non-governmental organizations appropriate with the response sectors.

However, there are obstacles that could not be resolved until the completion of the nuclear contingency plan, it was related to the provision of Potassium Iodide (KI) tablets for potentially affected communities. This issue was noted in the nuclear contingency plan that KI tablets will be provided by the Ministry of Health after written justification is available, such as legalization of nuclear contingency plans.

The TRIGA2000 reactor is located in Bandung nuclear area. The TRIGA2000 reactor is include to level two radiological hazard category (BAPETEN, 2010; IAEA, 2015). It means that incidents occur in the reactor might increase the radiation dose for community outside the reactor, so emergency response measures will be needed to be taken outside the reactor. Based on nuclear contingency plan in Bandung, West Java document (2014) (BAPETEN, 2013), the worst nuclear scenario accident is triggered by reactor operating system failure due to the fall of nuclear fuel that has fuel fraction of 40% from a crane to the reactor floor.

It was scanned that at the same time, the reactor ventilation system breaks down which causes the release of radioactive substances from the nuclear fuel cladding to the reactor chimney and then to the environment. Based on analysis of its potential hazards, the event will cause radioactive release as well as radiological impact to the environment within the vicinity of the reactor. The focus of emergency response measures are: sheltering personnel in the BATAN building, evacuating personnel from the BATAN area and administering KI tablets. Other actions taken are recovery of radioactive sources, monitoring of environmental radiation levels, and decontamination of victims and contaminated equipment. The most affected aspects are: the population (sheltering/evacuating the resident), the land transportation routes (re-routing of transportation routes) and the environment (environmental contamination).

To coordinate the nuclear emergency response measures, emergency response sectors were established as discussed in Section 3.1. In this nuclear contingency plan document, the proposed emergency response period is 7 days through a Decree of West Java Governor. The location for evacuation was identified at Sasana Budaya Ganesha located in the north of the Bandung nuclear area. Provision of KI tablets has not come to a solution in the discussion. As a note, in this contingency plan document, the provision of KI tablets will be provided by the Health Office of West Java after written justification is available, such as legalization of nuclear contingency plans. Kartini Reactor is located in Yogyakarta nuclear area. The location of Kartini reactor is close to education, residential and shopping areas along Babarsari street. Based on its hazards assessment, Kartini reactor is include to level three radiological hazard category (BAPETEN, 2016). It means that incidents occur within the reactor are predicted would not potentially increase the radiation doses for communities outside the reactor. However, it might potentially cause an acute radiation effects in confined areas within the reactor.

Based on the Kartini Reactor Contingency Plan document (2016) (BAPETEN, 2013), the worst nuclear scenario accident is triggered by external events that is the failure of the reactor security system due to insider's role causing sabotage and bombing in the reactor core. The bombing causes all the fuel to break so that the radioactive substance release from the reactor to the reactor chimney and then to the environment. In contrast to the two previous nuclear research reactors, RSG-GAS and TRIGA2000, which has potential hazard to the community outside the reactor, the worst accident in the Kartini reactor is predicted not to cause potential impacts to the community.

However, to increase alertness and preparedness since the surrounding reactor has been dense by settlements, hotels and shops, and also it was an agreement of all contingency plan drafting team, it was agreed that the nuclear emergency will have potential impact up to a 200 m radius from the reactor. The most potential affected area is predicted up to a 100 m radius from the reactor (in fact, it must be proven by the environmental radiation measurements). The emergency response measures taken are: sheltering personnel of the Yogyakarta nuclear area in the BATAN building, evacuating personnel from the Yogyakarta nuclear area, and administering KI tablets. Another action taken are recovery the reactor to return it to normal operating conditions, environmental radiation monitoring, and decontaminating victims and contaminated equipment. The most affected aspects are: population (sheltering residents around the reactor), land transportation routes (re-routing transportation routes) and the environment (environmental contamination).

The emergency response measures at Kartini reactor focusing on coordination of the aid arrangements from local emergency service organizations outside the reactor (such as fire fighter, ambulance, local Police and BPBD) to the reactor emergency response organizations. The purpose of this arrangement is to maintain the safety of the emergency response workers coming outside to the reactor who are generally "lay" with radiation hazards and radiation protection measures that must be taken to minimize the radiation dose received due to exposure to radiation and/or radioactive contamination. To coordinate the nuclear emergency response measures, emergency response sectors were established as discussed in Section 3.1. In this nuclear contingency plan document, the proposed emergency response period is 7 days through a Decree of Sleman Regent. The location for evacuation is at the UPN Babarsari which is located in the south of the Yogyakarta nuclear area. Sections 3.1-3.3 describe briefly the emergency response plan in each research reactor that is contained in the nuclear contingency plan.

More comprehensive discussion on the affected aspects, affected areas, estimated number of victims, activities carried out by each emergency response sector, as well as the needs of each emergency response sector can be seen in the nuclear contingency plan documents (BAPETEN, 2013). From the discussions in Sections 3.1 to 3.3, the researcher made the analysis as follows: (a) Based on the hazards assessment, the disaster risk hazard from the three reactors is different. The disaster risk hazard for nuclear reactor is in line with the magnitude of the reactor power. That is, a reactor

with a greater power has a greater disaster risk hazard than the smaller power reactor. There is an international consensus that nuclear reactor with a power equal to or >2 MWth has a potential hazard, in case of nuclear emergency, to increase radiation doses for people outside the reactor (IAEA, 2007) (b) The reactor location is also affects the disaster risk hazard.

Reactor located close to settlements and people activities have a greater disaster risk hazard if compared than reactor located in a remote area; and (c) The disaster risk hazard from the three nuclear research reactors from the largest to the smallest one. The reactor Safety Analysis Report contains probabilistic safety analysis and an explanation of each potential accident risk and its mitigation procedures by using reactor safety features/systems (The Republic of Indonesia, 2006) it is expected that accidents occur in the reactor will not affect community outside the reactor. Thus, because mostly potential accidents risk have been identified and can be handled by the reactor safety features/systems. One application of the reactor safety system is a defense in depth system. The defense in depth system is a barrier system to prevent the release of radioactive substances from the reactor core to the environment. This starts from preventing accidents (prevention), controlling and protecting the reactor in the event of an accident (protection) and last is minimizing the impact of an accident IAEA, 1996).

However, even though nuclear reactor has been designed safely as a technological basis, the probability of accidents that have not been identified by reactor safety features/systems is still remains. Therefore, the capability to deal with the worst-case scenario of a nuclear reactor accident must be possessed. There are two types of accidents in nuclear reactors, namely: (a) Design basic accident (DBA) is a type of accident that has been identified and anticipated by the safety system. The reactor safety system is expected to work to handle DBA accident types; and (b) beyond design base accident (BDBA) is the worst type of accident that might cause release of radioactive substances to the environment outside reactor. The reactor safety system is not expected to work to handle BDBA accident types. The three nuclear contingency plans for research reactors use BDBA as the basis for determining events and developing scenarios.

BDBA has also become an agreement of the drafting team that develop the nuclear contingency plans. All three nuclear contingency plans also have not discussed the recommended dosage of KI tablets to the public. WHO (1999) provides recommendations for KI tablet dosages as described in Table 1. Of the three nuclear contingency plans above, two plan have been tested in nuclear emergency response exercises. The Kartini reactor contingency plan has been tested in 2016 through facilitation of the

**Table 1: Nilai Cronbach's alpha**

Variable	Koefisien Cronbach's alpha	Criteria	Description
Management of service strategies	0,821	0,8	Reliable
Quality of public satisfaction	0,863	0,8	Reliable

Source: Primary data processed 2019

BPBD D.I Yogyakarta, BPBD Sleman and BATAN Yogyakarta. The RSG-GAS contingency plan has been tested in 2016 through facilitation of BAPETEN, BATAN and BPBD South Tangerang (BAPETEN, 2016) From evaluation of the nuclear emergency response exercises, feedbacks were obtained for the improvement and updating of the nuclear contingency plans. However, up to present review has never been done. This challenge needs to be coordinated among the relevant agencies in order to achieve an effective and efficient nuclear emergency response objectives. Another challenge is related to the provision of KI tablets for potentially affected communities. The reactor operator provides KI tablets only for personnel inside the reactor area and emergency response workers coming from outside reactor to provide assistance in the mitigation measures. In the nuclear contingency plans, the provision of KI tablets for communities within potentially affected radius were proposed through the Ministry of Health or the Health Office. However, written justification is needed in the procurement, such as the legalization of nuclear contingency plans. Thus, an active role is needed from all relevant stakeholders, especially the local governments that have potential hazard of a nuclear disaster to legalize the nuclear contingency plans that have been developed. Sheltering all personnel in the reactor area (this should include guests/visitors) and communities within a potentially affected radius.

Sheltering is taken by closing the ventilation of the house/building to minimize radioactive dust entering the room. Sheltering is carried out in a limited time, which is until there is an evacuation decision if the emergency lasts long enough. Sheltering is not effective for more than 1 day (IAEA, 2013) (a) Evacuate all personnel in the reactor area (this should include guests/visitors) and communities within a potentially affected radius. Evacuation is carried out based on priority, that is areas with higher radiation risk hazards take precedence over evacuation to areas that are less of radiation risk hazard. Evacuation should also consider vulnerable groups and hospitalized patients. Evacuation must use a closed vehicle to minimize radioactive dust contamination.

The evacuation routes and evacuation locations must be in the opposite direction of the wind. Procedures for minimizing radioactive dust contamination are applied during evacuation, for example by using masks and clothing that covers the entire body. (b) For the Kartini reactor, evacuation measures are only carried out for personnel inside the nuclear area. For people potentially affected around the reactor, sheltering measures are implemented.

This action is in accordance with the explanation in section 3.3 that is based on analysis its potential hazards will not potentially cause radiation hazard to community outside the nuclear area. Sheltering actions carried out to provide safety to the community. Taking consideration that around the Kartini reactor have been densely populated by settlements, hotels and shops. However, if the emergency lasts long enough, then according to the IAEA EPR-NPP Public Protective Actions (2013) it is not effective to carry out sheltering for more than 1 day, then the decision makers may considered the evacuation; (c) Administering KI tablets as soon as possible to all personnel in the reactor area and communities within the potentially affected radius. Administering KI is carried out to

prevent the radiation doses caused by internal exposure due to inhalation of radioactive iodine. There is a difference in the timing of administering KI tablet among the three contingency plans:

According to WHO (1999) and IAEA (2005) the effectiveness of KI tablets decreases along with the delay in administration after the release of radioactive substances (IAEA, 2013; WHO, 1999) The effectiveness of KI tablets decreased by 20% if KI tablets were given 4 h after radioactive release and decreased by 50% if given 6 h after radioactive release (WHO, 1999, "Guidelines for Iodine Prophylaxis Following Nuclear Accidents" page 19-20); and Prohibiting consumption of contaminated local food and water. For Kartini reactor contingency plan this action is not carried out, as the reason described in section 3.3. However, environmental radiation monitoring activity is still carried out during nuclear emergency response period.

If the monitoring results show contamination exceeding the permission limit, then the decision makers may consider prohibition consumption of contaminated local food and water. The concept of emergency response measures described above are in line with the requirement of urgent protective actions in the nuclear emergency (IAEA No. GSR part 7, 2015: Requirement 9). However, the reference value indicating when those sheltering, evacuation, administering KI tablets and prohibiting the consumption of local food and water have not been discussed. The IAEA standard provides recommendation that protective measures are carried out in accordance with the results of environmental radiation monitoring (IAEA, 2012) they are: (a) Evacuation, sheltering and administration of KI tablets are carried out if the environmental radiation dose rate exceeds the value of 1000 microSievert/hour; and (b) Prohibition of consumption of local food and water is carried out if the environmental radiation dose rate exceeds the value of 1 microSievert/h.

## 2. METHODOLOGY

### 2.1. Service Strategy Management

One element that determines the success of a business is the quality of service. Services, according to Stanton (2001. p. 220) are activities that can be defined separately which in essence is not palpable, fulfilling needs, and is not bound by the sale of other products or services. Whereas according to Syafarudin and Sudiarditha (2018) service is any action or activity that can be offered by one party to another party which is basically intangible and does not result in any ownership. Winder (1996) found good service research could be related or not linked to a physical product. Service is the behavior of producers in order to meet the needs and desires of consumers for the achievement of satisfaction with consumers. Such behavior can occur at the time, before, or after the transaction (Griffin, 2002).

Furthermore, service quality according to Hertati (2015) is the context, community perceptions, and needs, and desires of the community. Quality depends on the wants and needs of customers. Gultinan (1997) states that quality is a subjective assessment of society Quality can be defined if it is not associated with

a particular context, certain attributes, and characteristics of something. Thus the quality is very dependent on something. Gultinan (2002) states that the quality of service can be known by comparing consumers' perceptions of the actual service they receive with the services they expect for the service attributes of a company.

Hallowell (1996) states that the services received and felt are as expected, the quality of service is perceived to be good, and if it exceeds expectations, then it is very good, while if otherwise the quality is perceived poor. UNIDO (2006) research results found that service strategy is an integral part of business strategy which gives direction to all management functions of a business organization. The results of Goteborg's research (2007) found that the objective of a marketing strategy is that program implementation in achieving organizational goals can be done actively, consciously, and rationally, about the achievement of a business product achieving its objectives in an increasingly turbulent business environment. Syafarudin and Mulyana (2019) states that then the characteristics of service strategy management are as follows (Kumar, 2002):

1. Providing directions in achieving goals  
As already mentioned in the above organizational management understanding that the manager's role is to direct all parties in this case the company's resources to carry out activities that lead to the company's goals. A clear direction of activities must be the basis for controlling and evaluating success (Archer and Wesolowsky, 1996).
2. Safeguarding the interests of various parties  
Managers in developing strategies by meeting the needs of each party such as suppliers, employees, shareholders, banks and the wider community. These components play a role in the success or failure of policies made (Bowen, 2001).
3. Anticipate Every Change Evenly  
The existence of strategic management enables executives to anticipate changes and prepare guidelines for control. The aim is to broaden the perspective of thinking (Bastos and Gallego, 2008).
4. Relating to Effectiveness and Efficiency  
The strategy manager is responsible not only for concentrating ability over the interests of efficiency but also having serious attention to resources to work hard by doing work effectively (Brady and Cronin, 2001).

## 2.2. Quality of Community Satisfaction

Hanno and Christian (2009) states that the goal of every business is to create customer satisfaction, with which benefits such as; public relations become harmonious, provide a good basis for services that are comfortable and safe so as to encourage the creation of satisfaction loyalty, word of mouth recommendations which of course are good for security, reputation is good, and of course the performance of the security forces is rising as well (Ortengren and Hogberg, 2010). Furthermore Kruse, (2010) states that on the contrary, if community satisfaction is neglected, it will obviously have a negative impact on the performance of the government security apparatus. Society in this case prefers intelligent State apparatus and world security hereafter. Community satisfaction is a concept that is well known and widely used in various community studies.

Karatepe and Ekiz, (2004) states that inequality will cause a mismatch, that is, a positive mismatch increases or maintains community satisfaction and discrepancies create dissatisfaction. Based on organizational behavior, expectations, and performance mismatches felt by the community that positive and negative matches have different effects on community satisfaction. Hertati (2016) states that discrepancies have a greater effect on public dissatisfaction with security apparatus than on conformity at the micro level. To make it easier to recognize people's satisfaction, measures such as expectations, the community are very satisfied, expectations, people are satisfied, hopes are disappointed. Bowen, (2001) states that the characteristics of community satisfaction The following is Sivadass (2000):

1. Service procedures, i.e. ease of the stages of service provided to the community in terms of simplicity of service flow (Butscher, 1999)
2. Terms of service, i.e. technical and administrative requirements needed to obtain services according to the type of service (Ball et al., 2004)
3. Clarity of service personnel, i.e. the existence and certainty of officers who provide services (name, position and authority and responsibilities)
4. Discipline of service officers, i.e. the seriousness of the officers in providing services especially to the consistency of work time in accordance with applicable regulations (Calif., 1987)
5. Responsibilities of service personnel, i.e. clarity of authority and responsibility of officers in the administration and completion of services (Beverly, 2002).

## 2.3. Effect of Management of Service Strategies on Quality of Public Satisfaction

Hertati (2015) states that the implementation of public services by government officials to the public is closely related to efforts to create community satisfaction as service recipients. Kumar and Shah (2004) states that the implications of the function of the state apparatus as public servants. Therefore, the position of the government apparatus in public services (public services) is very strategic because it will determine the extent to which the government is able to provide the best service to the community, which will thus determine the extent to which the state has carried out its role properly in accordance with its founding objectives. The opinion above is in accordance with the explanation of Liu-Thompkins et al. (2010) stating the response and expectations of the customer community to the services they receive, both in the form of goods and services will create satisfaction in themselves. Maarif (2012) is in line with the objectives of public services in general, namely preparing public services that are desired or needed by the public, and how to state correctly to the public about their choices and how to access them planned and provided by the government to create satisfaction for the public. Performance is a measure of an organization's success in achieving its mission (Williamson, 1975).

Mittal et al. (1999) states that performance is a combination of ability, effort and opportunity that can be assessed from the work that is obtained over a certain period of time and includes elements such as the quantity of results, the quality of results, the presence and ability to work together. Performance is carrying out an activity

and perfecting it according to its responsibilities with expected results. strategy is a large-scale, future-oriented plan to interact with the competitive environment to achieve company goals. Nadiri et al. (2005) states that the strategy reflects the company’s awareness of how, when and where it has to compete against who and for what purpose. In line with Nadiri et al. (2008) also said that strategy is the main pattern of action chosen to realize the vision of the organization, through mission.

Research Oliver (1999) states that the services of each act or action that can be offered by one party to another party which is basically intangible (not physical form) and does not produce ownership of something. Research Parasuraman et al. (1985) found that all forms of goods can be offered from one party to another party. Penelitian Pitta et al. (2006) is basically all economic activities whose results are not products in physical form or construction, which are generally consumed at the same time the same when generated and given added value (for example comfort, entertainment, pleasure, or health) or the solution of problems faced by consumers. Satisfaction According to Oliver et al. (2002) satisfaction is the level of one’s feelings after comparing performance or results felt with his hopes. Satisfaction is a feeling of pleasure or disappointment someone who appears after comparing between perceptions of the performance or results of a product and expectations (Kumar, 2003). So the level of customer or consumer satisfaction is a function of the difference between perceived performance and expectations. If performance is below expectations, then the community will be disappointed. But if the performance is in line with expectations, the community will be satisfied. Satisfied service Silvestro and Low (2006).

### 3. MEASUREMENT MODEL

Based on the framework developed in this study, for the purpose of testing the hypothesis is made the structure of the analysis of the overall research variable which is a combination of the measurement model and structural model that describes the causality relationship between exogenous variables and endogenous variables. Hair Jr. et al. (2014). states that to build an indicator precisely the formative combination of indicators. If it is reflective and if a combination. Indicators represent consequences that reflect or cause constructs. if there are consequences and if formative causes. If the assessment of changes in nature, all items will change in the same way (assuming they are both coded), if it is reflective and if not formative.

The better the quality of the management accounting system the better the quality of management accounting information. In measuring reliability in SEM, a composite reliability measure (measure of composite reliability) and variance extracted measure will be used (size of extract variant). The construct reliability is calculated as follows:

$$CR = \frac{(\sum std.loading)^2}{(\sum std.loading)^2 + \sum e_j}$$

Where *std. loading* (standardized loadings) can be obtained directly from the LISREL-8.7 and *e<sub>j</sub>* program output is a measurement error for each indicator or variable observed. Extract variants reflect the total number of variants in the indicators (observed variables) explained by latent variables. Size of extract variant (extracted variant) can be calculated as follows):

$$Variance\ extracted = \frac{\sum std.loading^2}{\sum std.loading^2 + \sum e_j}$$

Hypothesis:

H <sub>0</sub> : γ1.1, ≤ 0:	There is no The Effect of Management of Service Strategies on Quality of Public Satisfaction
H <sub>1</sub> : γ1.1 > 0:	Available The Effect of Management of Service Strategies on Quality of Public Satisfaction

### 4. TEST RELIABILITY

Testing the reliability of research instruments carried out internally. According to Hair Jr. et al. (2014).reliability tests were conducted to determine whether the measuring instruments that had been designed in the form of a questionnaire were reliable. Instruments that are reliable or reliable, will produce reliable data too. Reliability testing was carried out using Cronbach’s Alpha which measures consistency between items in the questionnaire. The general criteria used are: an instrument that is reliable internally if the Cronbach’s Alpha coefficient is >0.60 Hair Jr. et al. (2014). Reliability testing is done using SPSS software ver. 20 for Window. The following is a summary of the calculation results for testing the validity of the research instruments for each variable.

From Table 1, it appears that each measurement instrument is reliable because the Cronbach’s Alpha coefficient of each variable is >0.60, indicating that the three variables can be relied upon to be used as a data collection tool.

Based on information obtained from Table 2, the interpretation of the results of the evaluation of structural equation models is standardized after all models have been tested and the model is fit with the data. The magnitude of the effect of the variable The effect of management of service strategies on quality of public satisfaction is 0.52, which can be interpreted every decrease in management of service strategies 1 standard deviation resulting in a decrease in average service strategies on quality of public satisfaction by 0.52 standard deviations with the assumption other variables are constant. The observation unit in this study was the nuclear emergency response at RSG-GAS Serpong, TRIGA2000 Bandung, and Kartini Yogyakarta Research Reacto. This research uses primary data, while the data collection method used is a questionnaire. Validity test is done which is used

**Table 2: Parameter model structural**

Consequence	Mediator	Cause	Standard estimate	Estimated	Default error	Value-z	P value	R <sup>2</sup>
QPS	-	MSS	0,52	0,460	0,50	2,81	0,045	Sig

Source: Primary data processed 2019

to determine the eligibility of items in the questionnaire to determine the variables and the reliability test to measure the reliability of the object being measured. Data analysis was performed by descriptive and verification analysis. Descriptive analysis is carried out with balanced categorization using inter quartile ranges (Cooper and Schindler, 2014). Verification Analysis used to test the hypothesis in this study is to use structural equation modeling (SEM) or variance based components known as partial least square (PLS).

## 5. CONCLUSIONS

Service quality is a determining factor in shaping community satisfaction. This gives meaning to the community protectors in this case the security forces should pay attention to the quality of services provided to the community, because community satisfaction can be formed by the good level of quality of the services they provide. Not only security or guarantee aspects, but aspects that need to be improved such as Tangible, Reliability, Responsiveness, and Emphaty. Three nuclear research reactors in Indonesia have different hazard risks. Disaster risk hazards according to reactor power and reactor characteristics. From the analysis conducted, the greatest risk of disaster risk from the smallest are: RSG-GAS in Serpong with potential impacts up to a radius of 5 km, TRIGA2000 reactor in Bandung with potential impacts up to a radius of 1 km, and Kartini reactors in Yogyakarta with potential impacts up to 200 m radius. Three nuclear research reactors have the same concept of nuclear emergency response, namely: Protection, evacuation, provision of KI tablets and prohibiting the consumption of contaminated local food and water. Unresolved issues in the nuclear contingency plan and challenges that exist, such as the problem of providing KI tablets to potentially affected communities, need to be coordinated and find joint solutions among relevant institutions to achieve effective and efficient nuclear. emergency response objectives.

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