

Analysis of the Preparedness of Aircraft Rescue and Fire Fighting Officers in Overcoming Accidents and Fires at Adi Soemarmo Boyolali Airport

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Abstract

Every airport must have an Aircraft Rescue And Fire Fighting Unit (ARFF) or flight accident assistance and fire fighting. In supporting flight safety, the level of preparedness of the ARFF Unit must be high or required to always be on alert for incidents or incidents in the airport area so that the level of accidents, security and fires at the airport will be lower. The aim of this research is. to find out the preparedness of ARFF officers in the event of an accident and fire incident at Adi Soemarmo Boyolali airport and to find out the obstacles faced by Aircraft Rescue And Fighting (ARFF) Unit Officers in the event of an accident and fire at Adi Soemarmo Boyolali International Airport. This study used qualitative research methods. The research was carried out from 1 October 2022 to 30 November 2022 and continued with observation activities from 1 March 2023 to 7 March 2023 at the ARFF Unit at Adi Soemarmo Boyolali International Airport. Data collection techniques in this study used observation, interview, and documentation techniques and data analysis techniques used data reduction techniques, data presentation, and drawing conclusions. The results of the study show that the level of preparedness of the ARFF Unit at Adi Soemarmo Boyolali International Airport is increasing and continues to increase.

Keywords: Preparedness, ARFF, Adi Soemarmo Boyolali International Airport



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INTRODUCTION

Indonesia is a developing country in the world whose territory more or less consists of islands separated by waters and seas, so that air is the right mode of transportation to move from an area to a destination. airlines around the world. Adi Soemarmo International Airport is an airport located in Boyolali Regency, Central Java, Indonesia. The airport is located about 14 km north of Surakarta City, Boyolali. Based on the results of the theory and observations, Aviation safety is a key system that needs more attention from the government as a regulator and facilitator, airport managers as infrastructure providers, as well as by airlines as operators. These three systems determine the quality and quantity of the air transportation system, including flight safety. Aviation safety is a condition of fulfilling safety requirements in the utilization of airspace, aircraft, airports, air transportation, flight navigation, as well as other supporting facilities and public facilities (UU PN No. 1 of 2009).

In aviation in Indonesia, there was an accident involving the derailment of the Lion Air JT 892 from Makassar to Gorontalo on April 29 2022 at Jalaludin Airport in Gorontalo. Aircraft Rescue and Fire Fighting (ARFF) Soekarno-Hatta Airport Main Branch Office, PT Angkasa Pura II (Persero) assisted in the evacuation process as revealed by Erwin Revianto Senior Manager Of Branch Communication and Legal Soekarno-Hatta International Airport, PT Angkasa Pura II (Persero). Soekarno-Hatta Airport ARFF personnel come equipped with salvage equipment capable of moving aircraft to a safe location from the aircraft maneuvering area. Sending 12 personnel with adequate salvage equipment to maximize the evacuation of the fuselage at

Djalaludin Airport, Gorontalo. Arrival of ARFF Soekarno-Hatta Airport personnel, Every airport, especially in the Aircraft Rescue And Fire Fighting (ARFF) unit, is required to carry out preparedness activities if an accident might occur and response time, which is the reaction time for ARFF vehicles and personnel in carrying out rescue and extinguishing activities that have been standardized by ICAO. To always be physically ready, ARFF personnel always hold regular exercise so that the bodies of Aircraft Rescue And Fire Fighting (ARFF) personnel are ready and primed. Aircraft Rescue And Fire Fighting (ARFF) has three main tasks, namely the first is operations to carry out rescue in accidents and extinguishing fires, the second is maintenance which aims to prepare the ARFF operating vehicle so that it is always available when needed for operations,

Standard ARFF service requirements for airports in Indonesia serving international civil flights or domestic flights with a certain level of flight operations, must comply with the provisions in Chapter 9 Annex 14 of the Chicago conference and airport technical standards stipulated by the Directorate General of Civil Aviation. For airports serving domestic flights, the standard ARFF service requirements that apply are those determined by the Directorate General of Civil Aviation and published in the Aeronautical Information Procedure (AIP) with a level of service (Annex to the Minister of Transportation, 2009). Based on the above background,

Theoretical Basis Analysis

According to Harahap in (Azwar, 2019) The definition of analysis is breaking or breaking down a unit into the smallest units. From the opinion above it can be concluded that analysis is an activity of thinking to describe or solve a problem from the unit to the smallest unit.

Preparedness

Preparedness according to Law No. 24 2007, Article 1 Paragraph 7 is a series of activities carried out to anticipate disasters through organizing and through appropriate and efficient steps. Preparedness is an action taken in anticipation of a disaster to ensure that the actions taken can be carried out properly and effectively during and after a disaster occurs. According to BPBD (Regional Disaster Management Agency) it is stated that the stage of preparedness is carried out before a disaster will occur. At this stage nature shows signs or signals that a disaster will soon occur. So at this stage, all elements, especially the community, need to be prepared and always on standby to face the disaster.

Definition and Main Duties of the ARFF Unit

According to KP 14 of 2015, Aircraft Rescue And Fire Fighting (ARFF) is a unit part of handling emergencies at airports and ARFF personnel are personnel responsible for operating and carrying out maintenance / maintenance of ARFF vehicles as well as carrying out emergency response at airports and surrounding. ARFF (Aircraft Rescue And Fire Fighting) is a work unit that must exist at an airport. ARFF has three main tasks, namely operation, maintenance and training. The training aims to maintain the quality of ARFF personnel in dealing with unexpected events that we do not expect. Maintenance aims to prepare the ARFF operating vehicle so that it is always available when needed for operations,

Aviation Accident

Based on International Investigation Standards Annex 13-Aircraft Accident and Incident Investigation, tenth Edition-July 2010, incorporating Amendment 14 and supplement, Law

Number: 1 of 2009 concerning Aviation and Government Regulation of the Republic of Indonesia number 62 of 2013, regarding Transportation Accident Investigation, Article 9 states that an Aircraft Accident may consist of: An aircraft that crashes during takeoff, takeoff, or during flight. Collisions between aircraft or between aircraft and facilities at the airport. Aircraft that is lost or cannot be found. Aircraft experiencing a Serious Incident. An accident. By looking at the definition of accident and incident described above, then it can be concluded with the aim of facilitating the understanding of the two terms mentioned above. The conclusion is as follows: Accidents and incidents are unwanted or unplanned events. Accidents and incidents are caused by many factors and have a sequence of events that have an impact or effect in the form of: injury, disease, damage, near miss and loss. All accidents can be said as incidents. All incidents cannot be said to be accidents. All injuries are caused by accidents. All accidents do not always result in injury. Accidents and incidents are caused by many factors and have a sequence of events that have an impact or effect in the form of: injury, disease, damage, near miss and loss. All accidents can be said as incidents. All incidents cannot be said to be accidents. All injuries are caused by accidents. All accidents do not always result in injury. Accidents and incidents are caused by many factors and have a sequence of events that have an impact or effect in the form of: injury, disease, damage, near miss and loss. All accidents can be said as incidents. All incidents cannot be said to be accidents. All injuries are caused by accidents. All accidents do not always result in injury.

Fire

Fire is an oxidation event with three elements (fuel, oxygen and heat) which results in causing loss of property or injury and even death (Karla, 2007). According to the National Occupational Safety and Health Council (DK3N) fire is a disaster originating from fire that cannot or cannot be desired which can cause losses, both material losses (in the form of property, physical buildings, depots, facilities and infrastructure) and losses the non-material (such as fear, trauma) to loss of life or bodily disability caused by fire. According to the Directorate of Work Safety Supervision (2003) flame is a phenomenon whose symptoms can be observed, namely the presence of light and heat from a burning material.

Airport

According to Annex 14 of ICAO (International Civil Aviation Organization) Airport or airport is a certain area on land or water (including buildings, agencies and equipment) which is intended either in whole or in part for the arrival, departure and movement of aircraft. According to Law No. 1 of 2009 concerning Aviation Chapter I article 1 it is stated that an airport is an area on land and/or in waters with certain limits that is used as a place for aircraft to land and take off, board and drop passengers, loading and unloading of goods and places transfer of senses and between modes of transportation equipped with aviation safety and security facilities as well as basic facilities and other facilities.

Meanwhile, international airports are airports designated as airports serving domestic flight routes and flight routes to and from abroad.

Relevant Research

Table 1. Relevant Research

No	Name	Year	Research Title	Research result
1	Vicko Pratama Krisdyan	2019	Readiness of Aviation Accident Rescue Officers and Firefighters (PKP-PK)	The results of the study show that the reports written in the PKP-PK Unit log book contain many facilities that are not suitable for use but are still

			in an Effort to Support Smooth Operations at Abdulrachman Shaleh Airport in Malang	used and not maintained. The location of the PKP-PK Unit building at Abdulrachman Shaleh Airport in Malang which is in the Indonesian Air Force environment is very far from the Terminal which greatly hampers operations, this violates the existing Standard Operating Procedures (SOP) regulations.
2	Wira Sandi Tama	2019	Job Readiness Analysis And Employee Career Development at the Aviation Accident Assistance and Fire Fighting Unit (PKP-PK) at Yogyakarta Adisutjipto International Airport	Aviation Accident Relief Unit and Fire Extinguisher or abbreviated PKPPK located at the airport is a work unit that has the task of providing services to support Aviation Safety operations. In providing these services, the PKP-PK unit has the task of providing assistance for Aviation Accidents, especially aircraft accidents that occur on the ground. This study uses qualitative research, the data taken is standard documents from the PKP-PK office, the Aviation Law, data from interviews, and observation forms which will later be analyzed with the conditions that occur in the field. Research results from interviews, observation and documentation, It is known that the work readiness of PKP-PK employees at Yogyakarta Adisutjipto International Airport is in accordance with the standards that apply in the Aviation Law and even airports. PKP-PK Adisutjipto Airport as a reference for fire fighting from other agencies such as the TNI, POLRI, Basarnas and District level Fire Department in DIY.
3	Mochammad Dicky Prasetya Pratama	2020	Analysis of the Readiness of Aviation Accident Rescue Personnel and Fire Extinguishers (PKP-PK) in Efforts to Improve Aviation Safety at Yogyakarta International Airport	It is known that the readiness of PKP-PK personnel at Yogyakarta International Airport is in accordance with the applicable standards in the Aviation Law. Therefore, it is suggested to PT. Angkasa Pura I always upgrades the competence of PKP-PK personnel and facilities. Keywords: PKP-PK, Personnel Readiness, Aviation Safety

RESEARCH METHODS

Research design

Design or research design is a strategy to achieve research objectives that have been designed as guidelines or research guides throughout the research process. This type of research is using qualitative research. According to Sugiyono (2018), defining qualitative descriptive research is a study conducted to determine the value of an independent variable, either one or more variables without making comparisons or connecting with other variables. Qualitative descriptive research is aimed at describing and describing existing phenomena, both natural and human-made, which pay more attention to characteristics, quality, interrelationships between activities. According to Moleong (2016) states that qualitative research is research that intends to understand phenomena about what is experienced by research subjects such as behavior, perceptions, motivations, actions, etc., holistically, and by means of descriptions in the form of words and language, in a special natural context and by making use of various natural methods. This study uses a qualitative descriptive research method because this study describes the Readiness of Aircraft Rescue And Fire Fighting Unit (ARFF) Officers in Efforts to Support Smooth Operations at Adi Soemarmo Boyolali International Airport. in a particular natural context and by making use of various natural

methods. This study uses a qualitative descriptive research method because this study describes the Readiness of Aircraft Rescue And Fire Fighting Unit (ARFF) Officers in Efforts to Support Smooth Operations at Adi Soemarmo Boyolali International Airport. in a particular natural context and by making use of various natural methods. This study uses a qualitative descriptive research method because this study describes the Readiness of Aircraft Rescue And Fire Fighting Unit (ARFF) Officers in Efforts to Support Smooth Operations at Adi Soemarmo Boyolali International Airport.

Time and Place of Research

This research was conducted in March 2023. The data collection for this research was carried out at Adi Soemarmo Boyolali International Airport, which is located on Jl. Cendrawasih, Tanjungsari, Ngesrep, Kec. Ngemplak, Boyolali Regency, Central Java.

Research Instruments

In qualitative research, the instrument or research tool is the researcher himself. Qualitative researchers as human instruments function to determine research focus, select informants as data sources, collect data, assess data quality, analyze data, interpret data and make conclusions on their findings (Sugiyono, 2019). Instruments or other tools needed in this study include cameras, voice recorders, ballpoint pens, pencils, and books. The camera is used to document events that occur when making observations, both in the form of photos and videos. A voice recorder is needed to record conversations or voices when collecting data through interviews, observations and so on. While ballpoint, pencil.

Data Collection Technique

1. Observation. One technique that can be used to find out or investigate non-verbal behavior is by using observation techniques. Sugiyono, (2018) observation is a data collection technique that has specific characteristics when compared to other techniques. Observation is also not limited to people, but also other natural objects. Through observation activities researchers can learn about behavior and the meaning of this behavior. In this case the author makes observations regarding the work readiness of Aircraft Rescue And Fire Fighting (ARFF) officers in an effort to support smooth operations at Adi Soemarmo Boyolali International Airport.
2. Interview. Interviews are one of the techniques used to collect research data. Interviews are two-way communication to obtain information from relevant informants. Sugiyono, (2018) interviews are conversations with a specific purpose carried out by two parties, namely the interviewer (interviewer) who asks questions and the interviewee to provide answers to the questions given.
 - a. Structured interview. Structured interviews are used as a data collection technique, if the researcher or data collector knows for sure what information will be obtained. Therefore, in conducting interviews, data collectors have prepared research instruments in the form of written questions whose alternative answers have also been prepared. With this structured interview, each respondent was asked the same questions, and the data collectors recorded them.
 - b. Semi structured interview. This type of interview is included in the in-dept interview category, where the implementation is more free when compared to structured interviews. The purpose of this type of interview is to find problems more openly, where

the parties invited to the interview are asked for their opinions and ideas. In conducting interviews, researchers need to listen carefully and record what the informants say.

- c. Unstructured interview. It is a free interview in which the researcher does not use an interview guide that has been systematically and completely arranged for the data collector. The interview guide used is only an outline of the problems to be asked.

The type of interview used in this study is a type of structured research. So this researcher used an interview guide. Before going into the field, the researcher first prepares the interview questions that will be used. In addition, researchers also used unstructured interview guidelines, namely using one or two main questions that emerged spontaneously during the research process. This unstructured interview was conducted to dig deeper regarding information that was not yet known by the researcher.

3. Documentation. Documentation Sugiyono (2018) Documentation is a record of past events in the form of pictures, photographs, sketches and others. Documentation is a complement to users of observation and interview methods. In this study documentation was carried out to complement observation and interview data.
4. Literature review. Nazir (2013) data collection techniques by conducting a review study of books, literature, records and reports that are related to the problem being solved. This is done to obtain secondary data that will be used as a basis for comparison between theory and practice in the field. Secondary data through this method is obtained by browsing the internet, reading various literature, results of studies from previous researchers, lecture notes and other relevant sources.

RESEARCH RESULTS AND DISCUSSION

Form of preparedness efforts for Aircraft Rescue And Fire Fighting Unit (ARFF) officers in tackling accident and fire incidents at Adi Soemarmo Boyolali Airport

Preparedness according to Law No. 24 2007, Article 1 Paragraph 7 is a series of activities carried out to anticipate disasters through organizing and through appropriate and efficient steps. Preparedness is an action taken in anticipation of a disaster to ensure that the actions taken can be carried out properly and effectively during and after a disaster occurs.

Preparedness from the side of the ARFF Unit officers

The Aircraft Rescue And Fire Fighting Unit (ARFF) is one of the units at Adi Soemarmo Boyolali International Airport whose duties are required to always be alert and alert to handle all types of accidents that are at the airport. As ARFF Unit personnel, of course, many are equipped with knowledge that is useful for their duties, such as physical training for personnel to training in crime scenes. All types of training are carried out to support the quality of personnel readiness and alertness as well as to maintain or provide stability in the physical condition of the personnel.

Inspection or patrol activities are one of the Jobdesk of the ARFF unit where this activity aims to ensure that Adi Soemarmo Boyolali International Airport is always safe and free from the risk of accidents. In addition to maintaining the condition of the airport, inspections are also carried out so that ARFF personnel are accustomed to being in an alert status where this condition must always be maintained so that they are always ready to handle any problems at the airport that can cause potential accidents or fires at Adi Soemarmo Boyolali International Airport.

The preparedness of the ARFF Unit in tackling accident and fire incidents at Adi Soemarmo Boyolali International Airport has improved because the efforts made by ARFF Unit

personnel have become more mature and focused. The alertness of the ARFF Unit personnel in tackling incidents of accidents and fires is the key to being quick and responsive. Quick and responsive efforts are the key to the preparedness of the ARFF Unit where these efforts are applied by providing first aid to victims of accidents and fires at Adi Soemarmo Boyolali International Airport. In addition, in the event of a fire,

Based on the results of the interview, Adi Soemarmo Boyolali International Airport said that in our ARFF unit, officers must be required to extinguish it as quickly as possible in order to minimize casualties, but our job is not only to handle plane crashes but also fire incidents at terminals and pus around the airport. Apart from being alert in dealing with accidents and fires, the ARFF Unit is also required to be alert to always check the work facilities owned by this Unit such as routinely checking the main vehicle and supporting vehicles every day to ensure the condition of the vehicle is ready for use, besides that the ARFF Unit also always check the completeness of all existing facilities in order to be used when an incident occurs.

According to Dian Koorpriadi as the Support Squad Leader ARFF Unit at Adi Soemarmo Boyolali International Airport, "To maintain the facilities and maintain them, we check the main vehicles and supporting vehicles every day and warm up each vehicle so that the engine and condition of each vehicle does not occur due to rare damage. at Panasin so we are obliged to check the vehicles and equipment in each vehicle.

Preparedness from the ARFF Unit facility side

Preparedness in terms of the ARFF Unit facilities at Adi Soemarmo Boyolali International Airport can be rated in a good category, because this airport has prepared several supporting facilities for the ARFF Unit such as the main vehicle for 3 F1 cars in 2021 with a water capacity: 12,500 liters and foam capacity: 1,700 liters , F2 of 2012 with water capacity: 11,600 liters and foam capacity: 1,500 liters, and F3 of 1993 with water capacity: 9,000 liters and foam capacity: 1,200 are fire trucks and the ARFF unit also has supporting vehicles such as 3 ambulances and 1 car command.

Some of the conditions of the facilities at the ARFF Unit at Adi Soemarmo Boyolali International Airport are routinely checked to maintain the condition of use value such as the condition of the 2021 F1 car which we just got in November can still function 100% for the 2012 F2 which was obtained in 2012 condition about 95% is still good in performance, acceleration and emission everything is still good but there is a lack of wind pressure if that's why the tail comes with help from an outside compressor there is also F3 in 1993 which is still pretty good with conditions around 80% and maybe the drawbacks are the same too with the F2 under pressure because the F3 was driving for a long time, that's why the F3 was made a supply car for F1 and F2 cars.

Several forms of obstacles faced by Aircraft Rescue And fire Fighting Unit (ARFF) officers when accidents and fires occur at Adi Soemarmo Boyolali International Airport

Obstacles faced by ARFF Unit officers in the event of accidents and fires not only from Obstacles from the ARFF officer's side, but also from the ARFF facility's constraints which can also cause obstacles to be faced by ARFF officers.

Obstacles from the side of ARFF officers

Based on the results of interviews with ARFF officers, information was obtained about the obstacles faced by ARFF officers not so much as according to Dian Koorpriadi as Support Squad Leader ARFF Unit at Adi Soemarmo Boyolali International Airport who said that to have never

experienced problems but rather the age factor where there are decreased age but still in a prime standard to help the power of an aviation accident.

Constraints from the ARFF facility

Based on the results of interviews with ARFF officers, information was obtained about obstacles in ARFF supporting facilities such as a lack of supply of FOAM or foam in the fire extinguishers, then a decrease in the supply of fuel for ARFF unit vehicles, damage to the ARFF unit vehicle water pump components, and damage to the Hydrant or fire extinguisher. The findings from this study are in line with Vicko Pratana Krisdyan's 2019 research, entitled Readiness of Flight Accident Rescue Officers and Fire Extinguishers (PKP-PK) in Efforts to Support Smooth Operations at Abdulrachman Shaleh Airport in Malang. Similarities with previous research are found in the object under study regarding the assistance of ARFF officers if there are accidents and fires at airports. In this study, it is different from previous studies, the difference in research is in the time and place of research. In this study, the author examines the preparedness of ARFF unit officers in tackling accidents and fires at Adi Soemarmo Boyolali Airport.

CONCLUSION

The preparedness efforts of the Aircraft Rescue And Fire Fighting Unit (ARFF) officers in tackling accident and fire incidents at Adi Soemarmo Boyolali Airport are quite good. Quick and responsive efforts are the key to the preparedness of the ARFF Unit where these efforts are applied by providing first aid to victims of accidents and fires at Adi Soemarmo Boyolali International Airport. %, F2 with 95% condition and F3 with 80% condition, Several forms of obstacles are faced by the Aircraft Rescue And fire Fighting (ARFF) Unit Officers when accidents and fires occur at Adi Soemarmo Boyolali International Airport. at the age of the officers, who were on average aged 30-47 years, there was a lack of human resources in the ARFF Unit, while in External Constraints there was still insight from farmers who carried out arson in the area close to Adi Soemarmo Boyolali Airport.

From the results of research on the Preparedness of ARFF officers in dealing with accidents and fires at Adi Soemarmo Boyolali airport, the authors provide suggestions: For Companies, Suggestions for companies are the need to repair several supporting vehicles that are damaged and the completeness of the equipment so that it can support the performance of ARFF officers, the need for recruiting human resources who are still lacking to support officers who still need quality human resources for Adi Soemarmo Boyolali Airport. For further researchers, the data used by this researcher is data on the preparedness of Aircraft Rescue and Fire Fingting (ARFF) officers in tackling accidents and fires at Adi Soemarmo Boyolali airport. more in-depth by collecting more in-depth and efficient data in tackling accidents and fires in the ARFF unit for better and optimal results.

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