

# ANALYSIS OF RISK MANAGEMENT ON THE PERFORMANCE OF GROUND HANDLING OFFICERS ON THE AIR SIDE OF THE IMPLEMENTATION OF A SAFETY MANAGEMENT SYSTEM (SMS) AT DJALALUDDIN GORONTALO

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## ABSTRACT

One of the flight services provided at Djalaluddin Airport is airside service. The airport cooperates with the ground handling department which is responsible for providing air services. Even though the government has currently made regulations in accordance with the Standard Operating Procedure (SOP), there are still deviations found regarding ground handling officers who have not implemented the Safety Management System (SMS). This may affect the level of flight safety. This research uses a qualitative descriptive method in the form of a questionnaire, a literature review, and observation, in addition to the research approach. The results of deviations in the performance of ground handling officers obtained results that included extreme risk (intolerable), high risk (tolerable), and medium risk (acceptable).

**Keywords:** Risk Management, Ground Handling, Safety Management System (SMS)

## 1. INTRODUCTION

According to [22], an airport is a designated area on land or water with specific boundaries, used by aircraft for landing and taking off, as well as for the boarding and deboarding of passengers, loading and unloading of goods and cargo, and serving as a hub for intra- and intermodal transportation transfers, complete with facilities that ensure flight safety and security. Djalaluddin Airport (IATA:GTO, ICAO:WAMG) is an airport that hosts domestic flights located in Gorontalo regency, North Sulawesi Province. Djalaluddin Gorontalo Airport has connections with nearby airports, including Mutiara SIS Al-Jufrie Airport (PLW), Sam Ratu Lingsi Manado International Airport (MDC), Syukuran Aminuddin Amir Iuwuk Airport (IUW), Tampa Padang Mamuju Airport (MJU), and Sultan Hasanuddin International Airport (UPG). Djalaluddin Airport functions as a means of organizing flight services with two types of services, namely the air side and the land side. As a provider of airport services, Djalaluddin Airport should provide excellent service, one of which is airside service to ensure flight safety.

According to [18] Ground handling is a business activity airport management activities, ground handling is one of the airport-related service services to support

aircraft operational service activities at the airport. Ground handling works under the auspices of airlines, which is related to handling or providing loading and unloading services for passengers, baggage, cargo, post, and equipment to assist aircraft movement on land and the aircraft itself while at the airport. Ground handling officers can operate Ground Support Equipment (GSE) equipment. According to [19] aircraft ground service equipment and operational vehicles operating on the airside, including motorized and non-motorized.

In carrying out their work, ground handling officers are one of the factors that influence safety on the airside. Based on previous research [31] procedures for handling baggage, passengers, and aircraft at the airport have been regulated to create the same standardization between one airline and another. In carrying out their duties on the airside, ground handling personnel are more focused on aircraft services. According to [2] In airside operations, personnel go directly to the apron while still adhering to applicable SOP.

Airside is part of the airport that has operational functions in the airspace and all supporting facilities that are non-public areas. According to [13] Apron Movement Control (AMC) is one of the airport personnel who has duties according to the license and rating they

have, namely as an airside supervisor, vehicle movement supervisor on the airside, recording flight data, and cleaning supervisor on the airside. According to [12] has the following duties:

- a. Provide guidance to personnel, equipment/vehicles, and aircraft on the Apron, Supervise and regulate traffic movements on the Apron;
- b. Arrange aircraft parking on the apron; ensure cleanliness on the apron;
- c. Ensure facilities on the apron are in good condition;
- d. Ensure the safety of personnel, equipment/vehicles, and aircraft movement on the apron;
- e. Analyze all activities on the Apron during peak hours/peak season, and plan aircraft parking arrangements in abnormal/emergency conditions.

Every worker in a job indoors and outdoors has the potential to cause risks in working caused by hazards around the work area, heavy equipment, machines, materials, work environment, and workers that can cause harm. Risk Management is an assessment expressed in terms of the predicted probability and severity of the consequences of a threat taken as a reference to the worst-case scenario that can be predicted. Risk management is very important for the sustainability of a company or organization, namely as a tool to protect the company or organization from any possible losses. The benefits of risk management are:

- a. Ensuring business continuity by reducing the risk of every activity that threatens danger;
- b. Improving decision-making at all levels, Preparing the right program to minimize losses in the event of failure Ensuring business continuity by reducing the risk of every activity that threatens danger;
- c. Creating a sense of security in a company or organization;
- d. Increasing understanding and awareness of risk in every element in the company/organization;
- e. Meeting applicable regulatory requirements.

The risk of danger consists of moderate risk (Acceptable), high risk (Tolerable), and extreme risk (Intolerable). Currently, the government has made regulations that are in accordance with Standard Operating Procedures (SOP), but in reality, many deviations are still found in the performance of ground handling officers that are not in accordance with the Regulations.

The impact of risks on airside work can disrupt flight safety, thus affecting work time, work quality, and cost

losses. As for the results of observations carried out by researchers, there were several findings of deviations that could pose a risk to the performance of ground handling officers on the airside, namely:

1. Not wearing a safety vest on the airside;
2. Ground Handling personnel sit on the baggage conveyor;
3. Spilled aviation fuel which causes Foreign Object Debris (FOD);
4. Negligence of ground handling officers while working;
5. Wheel chocks are not installed during operation.
6. There is GSE vehicles equipment that is not placed in the Equipment Parking Area (EPA);
7. Ground handling officers pass through the garbarata while it is operating (docking/undocking);
8. Ground Handling Officer license inconsistency in GSE Operations;
9. Use of baggage carts that are no longer suitable for use

According to [22], "Every transportation service provider is required to implement a Safety Management System (SMS) based on the national aviation safety program." Therefore, it is essential to analyze risk management in the performance of ground handling officers on the airside concerning the implementation of the Safety Management System (SMS). Moreover, as recommended by the ICAO in Annex 19 Safety Management System and ICAO Doc 9859 Safety Management Manual (SMM), the Safety Management System (SMS), as outlined in [7], focuses on a systematic approach to identifying and managing risks. This approach aims to reduce the loss of human life, prevent damage to aviation facilities, avoid the revocation of flight permits, improve expenditure efficiency, and minimize negative impacts on society and the environment.

In the Safety Management System (SMS) there is Hazard Identification and Risk Assessment (HIRA).

a. Hazard identification

Hazard identification is a process that can be carried out to identify all situations within control or beyond control or events that have the potential to cause accidents and occupational diseases that may arise in the workplace. The danger of emerging safety risks is also an important way for an organization or company to prepare for situations that may occur. The hazards identification process is

1. Recording all objects in the workplace, Checking all objects in the workplace and its surroundings;
2. Conducting interviews with workers who work in the workplace related to these objects;

3. Recording all existing hazards and providing documented information regarding sources of danger.

In the company to all parties, especially stakeholders. Hazard identification provides various benefits, including:

1. To provide an understanding for all parties regarding potential hazards;
2. Reducing the chance of accidents by identifying hazards;
3. As a basis and input for determining appropriate and effective prevention and security strategies;
4. Providing documented information regarding sources of danger in the company.

In this way, they can get an idea of the risks of a business that will be undertaken.

b. Risk assessment

Risk Assessment is a method used to determine the magnitude of a risk that occurs from an activity by considering the level of severity and the possibility that it might occur.

To fulfill the objectives of this research, the researcher asked questions, namely What is the condition of the performance risk management of ground handling officers on the airside regarding the implementation of the Safety Management System (SMS) at Djalaluddin Gorontalo Airport? and What activities have the highest level of danger and have the highest risk? In writing this final assignment, the author limits the problems raised so that they do not expand and do not go beyond the context of the title. The limitations of the problem in this study are focused on the performance of ground handling officers on the airside, as well as the level of flight safety based on the Safety Management System (SMS), which is guided by regulations set by the government.

The purpose of this study is to determine the condition of risk management in the performance of ground handling officers on the airside regarding the implementation of the Safety Management System (SMS) at Djalaluddin Gorontalo Airport and to determine activities that have a high risk to flight safety on the airside.

A hypothesis is a temporary statement related to the research problem that is proposed and will be proven empirically. Thus the hypothesis in this study is that the Safety Management System (SMS) has not been implemented on the performance of ground handling on the air side at Djalaluddin Gorontalo Airport. Meanwhile, the benefit of this research is to determine the level of risk in the performance of ground handling officers in implementing the Safety Management System (SMS) at Djalaluddin Gorontalo Airport.

## 2. METHODS

According to [25] Research methodology includes a body of knowledge about systematic and logistical steps in searching for data relating to a particular problem to be processed, analyzed, conclusions drawn, and then solutions sought.

### 2.1 Research Design

According to [20] Research design is the entire process required in planning and implementing research. Research design is also a strategy applied by researchers to systematically connect each element of the research so that the analysis and determination of research subjects becomes more effective and efficient. This study was used to analyze the performance of ground handling officers on the airside regarding the implementation of the Safety Management System (SMS) at Djalaluddin Gorontalo Airport.

In determining the research design, some steps must be considered to be appropriate to the problem and research objectives. According to [20] there are two stages in conducting research, namely planning and implementation :

a. Planning Stage

The planning stage is the initial stage in conducting research. In the planning stage, researchers conduct direct observations, identify problems and create boundaries, formulate problems, determine the objectives and benefits of research, conduct literature reviews (theoretical studies and relevant research), and determine research methods.

b. Implementation stage

The implementation stage includes data collection in the form of questionnaires and documentation, data analysis, and drawing conclusions.

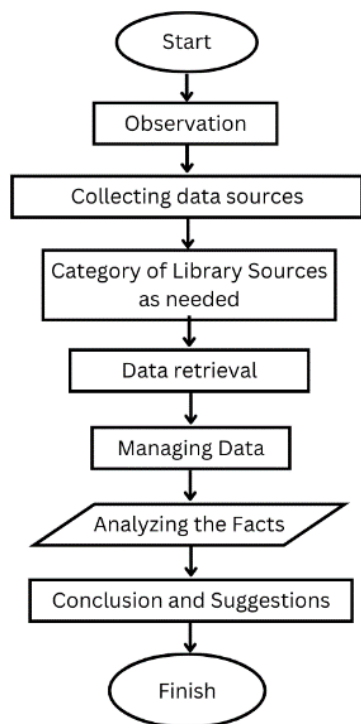


Figure 1. Research Design

## 2.2 Data Source

The data source in this study is using primary data. Primary data is data obtained from the first data source. In this primary data, the data source taken is data through a questionnaire distributed to respondents. After obtaining data from the questionnaire results, the next step is to manage the data.

## 2.3 Research Subjects

The data source in this study is using primary data. Primary data is data obtained from the first data source. In this primary data, the data source taken is data through a questionnaire distributed to respondents.

## Population

According to [28], a population is defined as a generalized area consisting of objects or subjects that possess certain quantities and characteristics, which are determined by researchers for study and from which conclusions are drawn. In this study, the author took the population from Ground Handling officers as personnel who work on the air side and Apron Movement Control (AMC) officers as officers who control and supervise the air side.

## Sample

Samples are part of the population used for research; samples are taken from valid and representative populations, which have the ability to measure what should be measured. In this study, samples were taken from six Apron Movement Control (AMC) officers.

## Research Object

According to previous research [27] The object of research is the nature of people, objects, or activities that are included in a certain type determined by the researcher, who aims to study them in order to draw conclusions. The object of research will be taken during activities in the airside area at DjalaLuddin Gorontalo Airport. In this study, the parties as the object of research are the performance of ground handling officers as operators and Apron Movement Control (AMC) personnel as supervisors on the airside.

## 2.4 Data Collection Techniques

### Observation

Observation is an activity of observing a particular object carefully at the research location. Observation can be done directly or indirectly. In qualitative descriptive research, observation can be used as a basic technique, namely by doing it directly. The goal is to find problems that occur in the field, describe what is learned, activities that take place, the people involved, and the meaning of events from their various perspectives. This study conducted observations on the performance of ground handling tasks at DjalaLuddin Airport, Gorontalo, North Sulawesi, during the On the Job Training (OJT) activities on December 11, 2023-February 28, 2024.

### Literature Study

A literature study is a data collection technique that involves reviewing books, literature, notes, journals, and reports relevant to the problem being investigated. The literature study conducted by the author includes an examination of rules and requirements related to potential causes of the issues at hand. In this research, the author is guided by the following applicable regulations

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1. Document 9859 Safety Management Manual
  2. UU No. 1 Tahun 2009
  3. PM 20 Tahun 2009
  4. PM 33 Tahun 2021
  5. KP 326 Tahun 2019
  6. PM 77 Tahun 2015
  7. Regulation of the Minister of Manpower Number: Per. 05/Men/1996
  8. SKEP 140/VI/1999
  9. PM 37 Tahun 2021
  10. KP 635 Tahun 2015
  11. SOP Apron Management Control Djafaluddin Gorontalo Airport

### Documentation

Documents in qualitative research are in the form of writings, pictures or photos, or monumental works of the objects studied. The document sheets studied are used as research instruments by the author which contain descriptions of the observation activity documents and documentation of researchers when conducting direct observations in the field, namely by taking pictures in the airside area at Djafaluddin Gorontalo Airport.

### Questionnaire

A questionnaire is a method used by providing recorded statements or questions to respondents in order to obtain answers to a problem in the form of opinions on various things about the object being studied, which can then be in the form of data that will be collected in the form of questionnaire results that can be assessed. The study used a questionnaire as a tool for collecting research data. The distribution of questionnaires containing a list of statements related to the problem being studied to Apron Movement Control (AMC) personnel, namely six officers or respondents.

## 2.5 Research Instruments

### Documentation guidelines

Documents in qualitative research are used to complement the questionnaire data and observations that have been carried out. Documents in this research are in the form of

writings, drawings, or monumental works from the objects being studied. Documentation activities in this study were carried out during direct observation in the field, namely by taking pictures of the airside area at Djafaluddin Gorontalo Airport.

### Questionnaire Guidelines

In this study, researchers used electronic media in the form of Google Forms. Researchers use this medium because it can produce efficient answers. The procedure for making a questionnaire is:

1. Determine the research problem;
2. Determine the information or data needed by setting indicators for each problem found;
3. Order the topics, items, and answers in each statement;
4. Tidy up the design on the background color of the questionnaire;
5. The questionnaire can be tested with several respondents;
6. After getting answers from respondents, the next step is to analyze the data on each answer.

## 2.6 Data Analysis Techniques

The research method in this final project is descriptive-qualitative. The descriptive qualitative method is a research method with data collection that appears in the form of words obtained through observation, questionnaires, and documents that are arranged into expanded text. In analyzing data from the questionnaire, there are steps that need to be taken into account, namely:

- a. Selecting the answer with the highest total on the Likelihood and Severity questionnaire
- b. Find the risk result by using the Likelihood and Severity statements, such as the following formula :

$$\text{Risk} = \text{Likely hood} \times \text{Severity}$$

Figure 2. Risk Formula

Information :

Likely hood : Possible time of accident

Severity : The severity of the consequences of a work accident.

- c. Determining the risk category for each finding can be seen with the help of the risk matrix table below :

Safety Risk		Severity				
		Catastrophic A	Hazardous B	Major C	Minor D	Negligible E
Frequent	5	5A	5B	5C	5D	5E
Occasional	4	4A	4B	4C	4D	4E
Remote	3	3A	3B	3C	3D	3E
Improbable	2	2A	2B	2C	2D	2E
Extremely improbable	1	1A	1B	1C	1D	1E

Figure 3. Risk Matrix

(Source : Doc 9859 Safety Management Manual, 2018)

- d. Determine the risk level for each negative finding, as in the table below :

Table 1. Safety Risk Tolerability

Safety Risk Index Range	Tingkat Risiko	Keterangan
5A, 5B, 5C, 4A, 4B, 3A	INTOLERABLE	Taking action to mitigate risks or stop activities
		Perform priority safety risk mitigation to ensure additional preventive controls are in place.
		Top management involvement
5D, 5E, 4C, 4D, 4E, 3B, 3C, 3D, 2A, 2B, 2C, 1A	TOLERABLE	Tolerable based on safety risk mitigation
		Management decision is required to accept the risk.
		Handling by related management
		Requires training by management
		Immediate corrective action
3E, 2D, 2E 1B, 1C, 1D, 1E	ACCEPTABLE	Acceptable
		No further safety risk mitigation
		Control with routine procedures

- e. The results obtained can be evaluated based on literature studies based on existing regulations.

### 3. RESULT AND DISCUSSION

The information needed for this study comes from the results of the questionnaire. The results of the questionnaire data were then analyzed using the risk formula, and the answers to the results were classified based on safety risk tolerance.

**Table 2.** Recapitulation Results

No.	Negative Findings	Likelihood (L)	Severity (S)	Safety Risk Index Range	Information
1	Ground Handling Officers Not Wearing Safety Vests on the Air Side	1	D	1D	MEDIUM RISK (ACCEPTABLE)
2	Ground Handling Officer sitting on baggage conveyor	2	D	2D	MEDIUM RISK (ACCEPTABLE)
3	Spilled aviation fuel during refueling which causes Foreign Object Debris (FOD)	2	C	2C	HIGH RISK (TOLERABLE)
4	Negligence of Ground Handling officers in carrying out their work	3	A	3A	EXTREME (INTOLERABLE)
5	Wheel chocks are not installed on the cart at the tires during operating hours.	4	B	4B	EXTREME (INTOLERABLE)
6	GSE equipment not located at EPA	2	B	2B	HIGH RISK (TOLERABLE)
7	Ground handling officers pass through the aviobridge during docking/undocking	3	C	3C	HIGH RISK (TOLERABLE)
8	Ground Handling personnel who drive GSE do not comply with the License they hold	3	A	3A	EXTREME (INTOLERABLE)
9	Use of baggage carts that are no longer suitable for use	4	C	4C	HIGH RISK (TOLERABLE)

From the table above, it can be concluded that there are different risk levels, which include:

1. Statement number 1 produces an answer of 1D which is categorized as Medium Risk (Acceptable);
2. Statement number 2 produces an answer of 2D which is categorized as Medium Risk (Acceptable);
3. Statement number 3 produces an answer of 2C which is categorized as High Risk (Tolerable);
4. Statement number 4 produces an answer of 3A which is categorized as Extreme (Intolerable);
5. Statement number 5 produces an answer of 4B which is categorized as Extreme (Intolerable);
6. Statement number 6 produces an answer of 2B which is categorized as High Risk (Tolerable);
7. Statement number 7 produces an answer of 3C which is categorized as High Risk (Tolerable);
8. Statement number 8 produces an answer of 3A which is categorized as Extreme (Intolerable);
9. Statement number 9 produces an answer of 4C which is categorized as High Risk (Tolerable);

It can be seen that there are activities that have the highest level of danger and have the highest risk, namely :

1. Negligence of Ground Handling officers in carrying out their work  
Negligence or inappropriate procedures in carrying out their work can result in serious injury or loss of human life, thus affecting flight safety. This requires awareness on the part of every ground

handling personnel of the importance of flight safety on the airside.

2. Wheel chocks are not installed on the cart at the tires during operating hours.

In performing ground service on an aircraft, one must pay attention to the surrounding conditions in the aircraft area so that nothing happens that could disrupt flight safety. To avoid accidents in the aircraft area, wheel chocks or movement-inhibiting mats must be used to avoid the movement of the vehicle by itself.

3. Ground Handling personnel who drive GSE do not comply with the license they hold

A ground handling officer must have a license or rating that he has and must carry out his duties according to his field. If not according to his field, then the officer can become a high-risk accident.

If there are deviations found in the performance of ground handling officers on the air side, it needs to be corrected to comply with regulations based on Standard Operating Procedures (SOP). The following are solutions to each deviation :

1. Increasing awareness of ground handling officers in using personal protective equipment;
2. Directly reprimanding and reminding fellow colleagues;
3. Implementing a ramp safety campaign in the use of Ground Support Equipment (GSE);
4. Conducting direct cleaning in the apron area implementing direct supervision

related to the movement of ground support equipment;

5. Reprimanding and giving sanctions by holding the airport PAS and giving a warning
6. Conducting a ramp checklist before the equipment is used for operation

Of the many deviations found in the performance of ground handling officers, there are activities that have the highest level of danger and high risk, namely:

- a. Ground handling officers are not serious about carrying out their work;
- b. Wheel chocks are not installed on the carts on the cart tires during operating hours;
- c. Incompatibility of licenses held by ground handling officers driving GSE

The existence of deviations in activities that have the most dangerous level and have a high risk on the performance of ground handling officers on the air side is caused by the problem of the lack of implementation of the Safety Management System (SMS). The root of the problem is the lack of implementation of the Safety Management System (SMS), namely awareness of each ground handling officer and human resource factors. Every negligence and error made by an individual will affect the achievement of an organization's strategy. Likewise, ground handling officers who need professional, qualified personnel in an effort to improve flight safety

In implementing the Safety Management System (SMS), the government functions as a regulator while Djalaluddin Gorontalo Airport acts as a flight service provider. The roles that act in carrying out the role are as regulators and implementers. Currently, the government is still playing the role of a service provider, but efforts at Djalaluddin Gorontalo Airport have not met the target of achieving the Safety Management System (SMS) due to the incomplete safety culture that has been built. The safety culture that has been formed so far has not been comprehensive enveloping the entire organization. In addition, there are still limited human resources who are theoretically and practically experts in safety management.

#### 4. CONCLUSION

Based on the results of questionnaire, that have been described by the author in the previous chapter then it can be concluded that :

- a. From the results of the analysis found in this study, the condition of risk management in the performance of ground handling officers on the air side is still not in accordance with the implementation of the Safety Management System (SMS) and government regulations that are guided by the Standard Operating Procedure (SOP). The results of risk management include :

#### 1. Extreme

- a. Ground handling officers are not serious about carrying out their work;
- b. Wheel chocks are not installed on the carts on the cart tires during operating hours;
- c. Incompatibility of licenses held by ground handling officers driving GSE

#### 2. High risk

- a. GSE equipment not placed in the Equipment Parking Area;
- b. Spilled aviation fuel, causing Foreign Object Debris (FOD);
- c. Ground handling officers often pass through the aviobridge when doing docking/undocking;
- d. Use of baggage carts that are no longer suitable for use.

#### 3. Medium risk

- a. Ground handling officers were found not wearing Safety vests on the airside; Ground handling officers were sitting on the baggage conveyor.
- b. There are deviations that have an extreme risk in the performance of ground handling officers on the air side, namely Negligence of Ground Handling officers in carrying out their work, Wheel chocks are not installed on the cart at the tires during operating hours, and Ground Handling personnel who drive GSE do not comply with the license they hold.

### 5. SUGGESTIONS

Based on the results of the discussion and conclusions that have been explained in the chapter above regarding the performance of ground handling officers in implementing the Safety Management System (SMS) on the airside at Djalaluddin Gorontalo Airport, the suggestions that the author can provide are as follows:

- a. For ground handling officers to increase awareness and compliance in accordance with the Standard Operating Procedures (SOP) and regulations set by the government, namely by paying attention to flight safety;
- b. Perform routine maintenance and ramp checklists on Ground Support Equipment (GSE);
- c. Participate in training and self-development related to the duties of ground handling officers on the airside regarding the Safety Management System (SMS);



- d. Increased supervision duties by Apron Movement Control (AMC) personnel who are fully responsible for supervising ground handling personnel and Ground Support Equipment (GSE) vehicles on the air side;
- e. To reduce the high tolerance between AMC and violators of order by giving sanctions or a sense of deterrence if they violate order. This is so that the performance of ground handling officers is in accordance with the Standard Operating Procedure (SOP) and regulations that have been set.

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