



Examination of The Feasibility Standards for Ground Support Equipment (GSE) on The Effectiveness of Flight Operations on the Air Side of Mutiara Sis Al-Jufri Palu Airport

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ABSTRACT

An airplane terminal could be put in to supply airship ground administrations sometime recently and after flights. In supporting airplane administrations on the ground, there are frequent occurrences due to GSE hardware working at Mutiara Sis Al-Jufri Air terminal that are not by the arrangements of the common necessities for the possibility of GSE gear. The condition of GSE hardware that's not reasonable can affect the familiarity of flight operations. So this inquires about points to decide the possible condition of GSE working on the airside of Mutiara Sis Al-Jufri Airplane terminal based on KP 635 of 2015 and the comes about of the review of the condition of GSE gear in supporting flight operational exercises on the airside. This ponder employments a subjective graphic strategy with information collection methods utilizing perception, meet, and writing consider strategies. Perception is carried out specifically on GSE gear. Interviews were conducted with three speakers, AMC workforce, GSE administrators, and GSE SPVs. As well as writing think about of related controls. At that point, the information investigation procedure is carried out by data decrease, information introduction, and conclusion. The conclusion of the ponder appears that there's still an issue that a few GSE hardware have imperfect conditions and is not following applicable controls. So the conclusion that can be drawn from this ponder is the require for repair and acquirement of GSE hardware that's not appropriate and not beneath important controls to be able to back the familiarity operation of airside flights.

INTRODUCTION

Mutiara Sis Al-Jufri Airport is a class 1 UPBU (Airport Organizing Unit) airport operating in Palu City, Central Sulawesi which was managed by the Donggasula Regency Government. In 1954 the Regional Government and the Donggala Public Works Department built an airfield which was named masowu or means dust. Based on the Decree of the Minister of Transportation Number KP 178 of 2014, the airport was given a new name, namely Mutiara Sis Al-Jufri Palu Airport, which was then managed directly by the Ministry of Transportation and in March 2017 the establishment of UPBU Mutiara Sis Al-Jufri as a BLU work unit.

All airports of course have activities that operate on the land side and air side, air side flight operational activities or ground handling aims to provide ground



services to aircraft (ground handling). Ground handling activities are a service provided to facilitate aircraft flights, preparation before, during and after completing a flight which includes passenger service and ground service (ramp) functions.

The aim of ground handling activities is of course to achieve flight safety, punctuality of flights and passenger satisfaction. In order to support the smooth operation of flights on the apron or airside, ground handling activities require aircraft ground service support equipment or Ground Support Equipment (GSE) that complies with airworthiness standards. Based on KP 635 of 2015, GSE is auxiliary equipment used to assist the interests of aircraft and passengers while on the ground during the departure/arrival process, the process of loading and unloading goods, passengers, cargo and post (Dirjenhub, 2015).

The condition of GSE equipment greatly influences the smoothness of flight operations on the air side. But in the field, the condition of PT's GSE equipment. Global Sky Aviation at Mutiara Sis Al-Jufri Airport is still often found in a condition that is unfit to operate and equipment that does not or does not meet the Ground Support Equipment (GSE) equipment suitability standards that have been regulated in KP 635 of 2015 and PM 91 of 2016.

In its operations, GSE equipment is still often found by AMC units with GSE equipment that does not meet standards, such as GSE equipment that does not have safety support devices, safety support equipment that is inactive, and equipment completeness standards that do not meet applicable standards. Thus, this research aims to determine the condition of the GSE equipment operated on the air side of Palu's Mutiara Sis Al-Jufri Airport in accordance with the provisions of the GSE equipment fitness requirements in KP 635 of 2015 and to determine the results of the airport's audit of the condition of the GSE equipment in operation, on the air side.

RESEARCH METHOD

Research design

This research utilizes a quantitative approach to In this research, the research method used is the qualitative descriptive method, the definition of qualitative research according to Sugiyono (2015) is research that aims to examine the condition of natural objects and places the researcher or writer as the key research instrument (Sugiyono, 2015). Research design based on Astarina's (2021) opinion is a form of strategy or way of achieving predetermined research objectives and has a function as a guide or guide for researchers in each research process (Astarina, 2021). Meanwhile, based on the opinion of Nazir (2014), a research design is a sequence of flows or stages that must be carried out



in planning and implementing research, Nazir, M. (2020). Based on the definition above, this research design can be carried out in two stages, namely the planning and implementation stages.

Research Setting

The location of this research is at the Apron Movement Control (AMC) unit office and the apron at Mutiara Sis Al-Jufri Class 1 Airport, Palu City. The choice of location was due to the existence of data that the author could take to support the writing of the research.

Population, Sample, and Research Object

Population is a range of entities or subjects. Population is a general condition or situation where there is a certain object or subject that has quantities and characteristics in accordance with the topic that has been determined by the researcher to be studied, analyzed, discussed and conclusions can be drawn. The population of this research is aircraft ground service support equipment or Ground Support Equipment (GSE) operated in the apron area of Mutiara Sis Al-Jufri Airport, Palu.

A sample is a data collection procedure that uses a portion of the total population determined and aims to determine the traits and characteristics desired by the population. The sample in this research is aircraft ground service support equipment (GSE) which provides services to scheduled or regular flights, with the types of GSE equipment in the form of ATT, BTT, and carts (luggage carts).

According to Sugiyono (2015) explains that a research object is an attribute or characteristic of a person, object or activity that has certain variations which are then determined by the researcher to be studied, and then conclusions are drawn (Sugiyono, 2015). In this research, the research object used is the condition of the feasibility of Ground Support Equipment (GSE) operating at Mutiara Sis Al-Jufri Airport, Palu.

Data Collection Techniques and Research Instruments

The data collection method is in the form of a statement about the nature, circumstances, certain activities, and the like. Data collection aims to obtain the data and information needed and appropriate to realize the research objectives that have been set. This research collects data using field observation methods and interviews with related parties.

Observation: In this research, the author carries out direct observation activities by observing and recording the condition of the ground support equipment (GSE) operating on the air side which is operated to provide services to scheduled flights at Mutiara Sis Al-Jufri Airport, Palu, which will then be compared based on existing conditions with



Regulations KP 635 of 2015 and PM 91 of 2016. Observations were carried out under supervision by the AMC unit and using observation sheet guidelines.

Direct observation allows researchers to document real-time conditions of GSE, providing rich contextual data that can reveal operational inefficiencies or compliance issues (Weston et al., 2022). Observations are guided by structured protocols, ensuring systematic data collection and enhancing reliability (Rose et al., 2019). The use of observation sheets facilitates the comparison of observed conditions against regulatory standards, such as KP 635 of 2015 and PM 91 of 2016. Interviews complement observational data by capturing the experiences and insights of personnel involved in GSE operations (Rambod, 2018). Various interview formats, including semi-structured and unstructured approaches, can be employed to elicit detailed responses and clarify operational challenges (Remenyi, 2022).

Interview: The interview stage is the stage used by researchers to find out the existing condition of GSE equipment at Mutiara Sis Al-Jufri Airport. In this research, the author conducted unstructured interviews with Apron Movement Control (AMC) personnel, and interviews with one GSE field coordinator or supervisor (SPV) and one GSE operator. Interviews in research to prove validity and validity require validation from an expert, in this research, the supervisor provides the validity of the interview.

Data Analysis Techniques

The method used by the author at the stage of analyzing the data for this research was using qualitative descriptive analysis techniques. The qualitative descriptive analysis technique is a data collection method that appears to be realized in the form of sentences words or symbols, the data of which comes from the results of observations, interviews, and documents described in text or extended sentences. According to Rahmayanti (2020).

Interviews: Semi-structured interviews were conducted to gather insights from personnel involved in GSE operations, allowing for an in-depth understanding of their experiences and challenges (Mason, 2023). Direct observations of GSE operations provided contextual data, enhancing the richness of the qualitative analysis (Tsang, 2023). Findings were organized into coherent narratives that reflect the operational realities at the airport (Bancin & Corry, 2023).

In analyzing the condition of ground support equipment (GSE) at Mutiara Sis Al-Jufri Airport in Palu, to analyze the data applied in this research, namely the process of collecting data and compiling data sourced from interviews and field observations related to the smooth operation of flights on the air side. Mutiara Sis Al-Jufri Airport, Palu. To make it easier for the author to analyze the data in this research, stages of reduction, data presentation and conclusion drawing were carried out.



Reduction element: the reduction element is a stage for summarizing, sorting and focusing on important points so that they are in accordance with the problem topics raised in the research, as well as to facilitate subsequent data collection activities.

Data presentation: By using data presentation, the resulting data will be easily organized, and arranged to form relationships, so that it can be understood easily. In qualitative research, data presentation is presented in the form of explanations or brief descriptions, charts, relationships between topics, and others. In many studies, the stage of presenting data in qualitative research is with text or sentences.

Conclusion: The results of data analysis regarding the suitability of Ground Support Equipment (GSE) are then explained and described in the form of words.

Research Location and Time

The location of this research is at the Apron Movement Control (AMC) unit office and the apron at Mutiara Sis Al-Jufri Class 1 Airport, Palu City. The choice of location was due to the existence of data that the author could take to support the writing of the research. Time. Meanwhile, for the time of this research, the author used the time when the author carried out On The Job Training (OJT) during December 2023 to August 2024

RESULT AND DISCUSSION

Observation: Observations in this research were carried out at the author's location On The Job Training (OJT). Observation activities were carried out precisely on the apron and room of the AMC unit at Mutiara Sis Al-Jufri Airport, Palu from December 13 2023 to February 26, 2024. The author made direct observations regarding equipment supporting aircraft ground services or Ground Support Equipment (GSE) at Mutiara Sis Al-Jufri Airport, Palu. Observations regarding technical standards for the feasibility of GSE equipment are based on the provisions of the requirements for safety standards in KP 635 of 2015. Then, observations regarding the usage life limits for GSE equipment are guided by regulations PM 91 of 2016.

The results of the observations obtained data in the form of the four (4) units of BTT equipment, but three (3) units were operated, it was found that each unit was in poor condition, each BTT unit had indicators of fitness that were not met and had similar deficiencies. Then the condition of the ATT equipment, totaling two (2) units, both of them are in a condition that is still not suitable, one of the ATT units is more than ten (10) years old and the other two units have several fitness indicators that are not met. Apart from that, random observations of thirty (30) baggage carts in operation showed that there were many baggage carts that were in an unfit condition, such as with bald wheels,

no side rails and components not installed properly. The following is the author's documentation when carrying out observations:



Figure 1. The condition of the ATT interior is not suitable

The image shows the condition of GSE equipment of the Aircraft Towing Tractor (ATT) type which no longer meets the indicators in the general provisions for the fitness of GSE equipment.



Figure 2. The wheels came off

The picture shows the condition of a baggage cart that was released while it was being operated for loading goods on the air side.



Figure 3. The condition of the ATT interior is damaged

The image shows that the condition of the ATT interior is no longer in accordance with the manufacturer's standards and does not meet several indicators in the general provisions for the fitness of GSE equipment.



Figure 4. The indicator panel is damaged

The indicator panel for BTT-type equipment is damaged. The condition of the BTT with an indicator panel like that is certainly not in accordance with the specifications for GSE fitness requirements which state that the indicator panel on motorized GSE equipment must be complete and active when operated.

Audit Results: The audit results in this research use the results of an internal audit carried out by Mutiara Sis Al-Jufri Palu Airport regarding the condition of GSE equipment from 19 to 20 October 2023, before the author came to carry out On The Job Training (OJT) at the airport. Air Mutiara Sis Al-Jufri Palu. The aim of carrying out this audit is to maintain the condition of the GSE's condition in accordance with standards and suitable for operation. Apart from that, the audit is also used as evaluation material for airports and ground handling parties in providing aircraft services on the air side. based on audits that have been carried out on several GSE equipment operated by PT. Global Sky Aviation at Mutiara Sis AL-jufri Airport, Palu. Based on these results, problems were found in the form of the physical condition of some GSE equipment being not good or 61 not in accordance with suitability standards. Apart from that, there are several types of motorized GSE equipment whose indicators in the equipment are not in good condition or are damaged.

Interview: In this research, the author conducted interviews, in this case, interviews were carried out directly through online or network media to the authorities regarding the suitability of Ground Support Equipment (GSE) equipment. Interviews with the authorities, namely Apron Movement Control (AMC) personnel as supervisors on the apron, GSE operators, and GSE Supervision. The author conducted interviews with three sources with three different question topics.

Results of interviews with GSE operators: Based on the results of interviews with GSE operators in topic 1 regarding the condition of GSE equipment and topic 2 regarding its



impact, it can be concluded that the condition of many of the GSE equipment in operation does not meet serviceability standards and the condition of GSE equipment can have an impact on the fluency of flight operational activities and there are several steps to overcome the inadequate condition of GSE equipment by carrying out inspections, routine monitoring and carrying out repairs.

Results of interviews with AMC personnel: Based on the results of interviews, from the audit results, many GSE equipment was still found in conditions that did not meet standards and required repairs. Apart from that, based on the opinion of AMC personnel, many of the GSE equipment operating at Mutiara Sis Al-Jufri Airport are inadequate or not up to standard due to their poor physical condition. Based on the description of the interview results, it can also be concluded that the inadequate condition of GSE equipment greatly affects flight operational activities on the air side. The impact that the condition of GSE equipment has on the smooth operation of flights on the air side is that it can hinder the smooth running of these flight activities.

Result of interviews with SPV GSE: Based on the results of interviews with SPV GSE, it was concluded that there was already GSE equipment that was in good and proper condition, but there was also GSE equipment that was not good, the condition of the GSE equipment would affect flight operational activities on the air side. To resolve problems related to the condition of GSE, the ground handling party uses several steps to overcome these problems and reduce the impact that occurs. These steps can be in the form of monitoring GSE, checking GSE, and implementing repairs to GSE that is not good.

DISCUSSION

Observation

Based on the results of observations or field studies carried out by the author in the apron and AMC room at Mutiara Sis Al-Jufri Airport, Palu, it was found that there was still a lot of GSE equipment that had conditions and components that did not comply with the provisions of the GSE fitness standard requirements. Apart from that, there is GSE equipment that has a service life that exceeds the maximum lifespan of the GSE equipment. Based on the audit results before the observations were carried out, the audit team still found GSE equipment that did not comply with the provisions of the applicable regulations, namely KP 635 of 2025 and PM 91 of 2016. Based on the description of the observation results, it can be seen that some of the GSE equipment was does not and has not met the requirements of the GSE eligibility standards.

The condition of the GSE equipment in the field can of course pose a serious risk to the smooth running of flight operations on the air side. Apart from that, the results of observations show that GSE equipment that has passed the audit stage still has conditions that have not received attention or repair. This shows a lack of awareness and concern or



safety awareness from ground handling parties regarding the inappropriate condition of GSE equipment.

Audit Result

Based on the results of the airport's audit of GSE equipment, it was found that GSE equipment was not suitable and needed immediate repair. To carry out this audit, the airport refers to KP 635 of 2015 regulations in analyzing the condition of the GSE being inspected. The audit showed that the physical condition of some of the GSE equipment was not good and inadequate. In the results of the audit, several motorized GSE equipment was found whose indicators were damaged, as well as a lot of GSE equipment in the form of carts whose physical condition was not suitable.

The condition of several GSE equipment operated during airside flight operations as described above will of course pose a high risk to the smooth running of flight operations. If this condition causes an accident or incident, it will certainly hamper the smooth running of flight operations. For example, if the wheels of a cart are bald and still in operation, if the wheels come loose, the cart will fall and the baggage being transported will fall on the apron, this will of course disrupt and hamper flight operations on the air side. The condition of the GSE equipment operated at Mutiara Sis Al-Jufri Airport in Palu shows a lack of supervision of GSE by the AMC unit and a lack of awareness and concern or safety awareness from the ground handling or PT. GSA and its personnel.

Interview

Based on the results of the interview, it can be concluded overall that the condition of the GSE equipment operating at Palu's Mutiara Sis Al-Jufri Airport is inadequate and does not comply with applicable regulations. The condition of GSE equipment in operation has a significant impact on airside flight operations or ground handling activities. The interview results show that the better the condition of the GSE, the more optimal the flight activities on the air side will be carried out and if the condition of the GSE equipment is not good, the flight activities on the air side will be hampered and disrupted. In addition, the ground handling party is responsible for maintaining the condition of GSE equipment.

In operating at Mutiara Sis Al-Jufri Airport, the ground handling team has its own steps to maintain the condition of GSE equipment in accordance with suitability standards, by carrying out routine inspections and carrying out repairs on GSE equipment in poor condition. Based on interviews, GSE and AMC operators also have the responsibility to maintain the good condition of GSE equipment, in accordance with the duties and obligations of GSE operators and AMC personnel. The GSE operator is responsible for carrying out routine inspections before the GSE equipment is put into operation and reporting the condition of the GSE equipment to the company. Meanwhile, the AMC unit



is responsible for providing supervision over the condition of GSE equipment operating on the apron and taking action against unfit GSE equipment being operated.

CONCLUSION

Based on the research that has been carried out by the author regarding the title and problems regarding the condition of ground support equipment (GSE) equipment at Mutiara Sis Al-Jufri Airport, Palu, we can then draw several conclusions, as follows: Based on the results of research in the field and literature studies, the condition of each unit of all types of Ground Support Equipment (GSE) in operation is still less than optimal and requires improvement to meet the general provisions for GSE fitness requirements in the relevant regulations and Based on the results of the audit carried out by Mutiara Sis Al-Jufri Palu Airport, it shows that each GSE equipment has conditions that contain indicators that do not meet the GSE eligibility requirements.

Suggestions that can be conveyed by the author and are appropriate based on the research conclusions are the following suggestions from the author: It is recommended that Mutiara Sis Al-jufri Airport, Palu, provide outreach and safety campaigns to GSE equipment managers and GSE operators regarding the importance of the suitability of GSE equipment following KP 635 of 2016 and PM 91 of 2016 regulations in supporting flight operational activities in airside and Carrying out internal audit activities by Mutiara Sis Al-Jufri Airport on a scheduled and routine basis for the GSE equipment management to monitor the condition of the GSE equipment to remain operational and emphasize the GSE equipment owners to immediately carry out repairs and new procurement of GSE equipment that is in good condition. which is not good to operate.

REFERENCES

- Astarina, E. & Y. (2021). Metodologi Penelitian. Penerbit Andi.
- Bancin, M. G., Corry, C., & Haloho, B. (2023). Pemahaman Nilai-Nilai Kepahlawanan Soekarno Dalam Pembentukan Karakter Peserta Didik Melalui Model Pembelajaran Role Playing. *Journal on Education*, 5(4), 13498-13514.
- Dirjenhubud. (2015). KP 635 Tahun 2015 Tentang Standar Pelayanan Penunjang Pelayanan Darat Pesawat Udara (Ground Support Equipment/GSE) dan Kendaraan Operasional yang beroperasi di Sisi Udara. In Kementerian Perhubungan. Kementerian Perhubungan.
- Mason, J. P., Werth, A., West, C. G., Youngblood, A., Woodraska, D. L., Peck, C. L., ... & Blandon, G. (2023). Coronal heating as determined by the solar flare frequency distribution obtained by aggregating case studies. *The Astrophysical Journal*, 948(2), 71.
- Nazir, M. (2020). Software Quality Assurance and Android Application Development: A Comparison among Traditional and Agile Methodology. *Lahore Garrison*



- University Research Journal of Computer Science and Information Technology*, 4(4), 1-29.
- Rahmayanti, W., & Arifin, E. Z. (2020). Analisis Gaya Bahasa dan Nilai Pendidikan dalam Novel Pulang Karya Tere Liye. *Jurnal Pendidikan Bahasa Indonesia*, 3(1), 77-85.
- Rambod, M., Pasyar, N., & Ramzi, M. (2018). The effect of zinc sulfate on prevention, incidence, and severity of mucositis in leukemia patients undergoing chemotherapy. *European Journal of Oncology Nursing*, 33, 14-21.
- Remenyi, D., Onofrei, G., & English, J. (2022). *An introduction to statistics using Microsoft Excel*. UJ Press.
- Rose, B. M., Garnavich, P. M., & Berg, M. A. (2019). Think global, act local: the influence of environment age and host mass on type Ia supernova light curves. *The Astrophysical Journal*, 874(1), 32.
- Sugiyono. (2015). *Metode Penelitian Kuantitatif, Kualitatif Dan R&D*. Alfabeta.
- Tsang, N. N. Y., So, H. C., Cowling, B. J., Leung, G. M., & Ip, D. K. M. (2023). Effectiveness of BNT162b2 and CoronaVac COVID-19 vaccination against asymptomatic and symptomatic infection of SARS-CoV-2 omicron BA. 2 in Hong Kong: a prospective cohort study. *The Lancet Infectious Diseases*, 23(4), 421-434.
- Weston, C. J., Di Stefano, J., Hislop, S., & Volkova, L. (2022). Effect of recent fuel reduction treatments on wildfire severity in southeast Australian Eucalyptus sieberi forests. *Forest Ecology and Management*, 505, 119924.