Light Sign Communi...

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Light Sign Communication Between Pilot and ATC: Language Function and Semiotics Analysis

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ABSTRACT: This study discusses the function of Light Sign Communication Between Pilot and ATC in the scope of Language Function and Semiotics Analysis. Language Function and Semiotics are two important things that can be used to discuss the Communication Between Pilot and ATC in the aviation system. This study combines aviation systems with linguistics. Objectives of this research are designed 1) to analyze the process of a signal meaning difference from gun light, and 2) to describe how pilots perceive signals from gun lights. The result of this study shows that the understanding in communicating between the Pilot and ATC is very important for flight safety. The failure of light sign communication with the pilot may lead to catastrophic. The implication of this study will increase the awareness of how important it is to maintain a communication system when flying for flight safety.

KEYWORDS: *Light Sign, Communication, Pilot, ATC, Language Function, Semiotics*.

I. INTRODUCTION

Communication is simply defined as transfer information from one place to another in a variety of ways or process. It is required for flight safety (Budhi, et al., 2021).It includes communication used in aircraft term or in ATC. In addition, it pondered more deeply and hopefully it hopespeople wiser in understanding and responding to all cases that arise linking language and attitudes or behavior of language-speaking groups language. It means that language has a function to interpret the ideas, concept and feelings to make the people understand or respond about it (Rabiah, 2018: Riski, et al., 2018). Traditionally it is said that language is a tool to interact or a means of communication in a sense, means conveying thoughts, ideas, concepts, or even feelings. The concept that language as a tool for conveying thoughts has a long history.

Humans communicate with verbal sounds or generally communicating with acoustic sounds, or in communication, sign is an alternative language to the language as spoken and written (Tammasse, et al., 2019). Air traffic controllers (ATCs) are responsible for guiding and assisting pilots to navigate safely and efficiently. The work of air traffic controllers starts from the moment the aircraft backs off or starts the engine. Air traffic controllers are divided into 3 sectors according to their area of responsibility. For take-off and landing activities and movement on taxiways, responsibility is entrusted to the air traffic controller within the tower control unit. The air traffic controller has to guide the pilot after take-off or before landing. Once the pilot has maintained his altitude at cruise level, control responsibility is entrusted to the area control unit.

In aviation procedure, the way air traffic controllers communicate with pilots and guide traffic is by radio communication or verbal communication with six languages might be used. They are English, French, Spanish, Arabic, Chinese and Russian but the main language spoken is English, in addition to these six languages, which is used to control traffic or to communicate with each pilot to exchange data or provide them with information. To maintain orderly flow of air traffic in both directions, air traffic controllers use signals from gun lighting lamps. This is a special case if the aircraft experiences a radio communication failure at the transmitter or fails miserably. There are three different colors and two different ways of transmitting light signals to the aircraft of which is subject to radio failure. The different positions of the aircraft might affect the meaning.

However, in semiotics paradigm it is considered too narrow because Language activities are basically referred to whom the speakes the language and to whom, when, and to what the language is aimed" Therefore, from a semiotics point of view, the function of language can be seen from various aspects, such as speaker, listener, topic, code, and conversation goals (Chaer and Agustina, 2004:15).

From the speaker's point of view, language functions isa personal identity which was proposed by Jakobs calls it the emotive function. That is, the speaker expresses his position about what are they talking about. The speakers do not only express emotions through language, but also show emotion when delivering a

speech. Therefore, the listeners can understand if the speaker is angry, sad, or happy. Communication, it can be seen from people's daily lives practice of communication or interaction between individuals and groups.

The language that people used is usually influenced by where the people live, as well as tribe our surroundings. In this case, culture is related to the way of human's life. The humans learn, think, feel, believe, and seek what is culturally appropriate. Language, friendship, customs, practical communication, social action, economic activity, politics, and technology, all of these are based on cultural patterns. This means that communication and sign cannot be separated, because sign do not only determine who is talking to whom, about what, and where the communication is takes place, but it also determines the encoding of messages, meanings and messages that he has for the conditions of sending, paying attention, interpreting messages. In this phase, the function of language communication takes part in the field of transportation.

Transportation functions hasa vital role in clue the territorial unity of the Unitary State The Republic of Indonesia functions for distribution equitable development and welfare for its citizens. Therefore, the government is continuously trying to improve transportation services to all corners of the country. Transportation does not only facilitate the movement of people/passengers, but also the movement of goods. In addition, transportation also provides benefits to maintain price stability of goods, increase the economic value of a region, and accelerate regional development. The government continues strive to provide reliable transportation service to get achieve the expected benefits.

The higher the frequency crossing or landing flights at the airport at this time, then the duties and responsibilities in charge of air traffic operations service become heavier. Therefore, the quality and reliability of work tools and resources the Human Power behind it must be really prime to achieve safety aviation In the world of aviation, there are three important pillars are the main factors. Airline, Airport, and Air Traffic Service (ATS). Current air transportation requires a supporting sector both in terms of facilities and human resources.

Air traffic controllers are tasked with guiding flights to arrive at their destinations safely, effectively and efficiently. The traffic guide is in charge of guiding the Pilot who flies the plane from one point to another safely. In the process, air traffic controllers communicate with pilots through conversations in English regulated by the International Civil Aviation Organization. Air traffic controllers and pilots urgently need to communicate each other to maintain flight safety. In addition to flight safety, this two-wayscommunication also serve to maintain effectiveness and efficiency as long as the aircraft moves in place and then flies until it lands back at the destination airport. Likewise, all the planes connected to this frequency can talk alternately.for traffic guides at the control tower if the damage occurs then a communication aid is needed in the form of a light signal called a Gun light.

Furthermore, Kumar (2011) stated that LED based VLC system can be used in vehicles environment on existing infrastructure such as LED traffic signal light. It means that LED signal becoming the important things to lead someone understand the meaning of the light signals. The transferring the information to the Pilot of airplane depicts the description of the information will be received by the Pilot by using gun light. The concept of gun light signal for the Pilot has multifunction, it makes the Pilot confuse to describe the functions of the signal. Therefore, the researcher is interested in analyzing the ambiguity of the signal comes from the gun light for the Pilot to make the airplane landing or take-off safely.

Communication between pilots and Air Traffic Controller (ATC) usually use VHF (Very High Frequency) radio to do communication. When the VHF radio does not work properlyor it has problem, ATC usually uses a tool called Gunlight. Gunlight as an alternative tool has functioned for communicating between ATC and the pilots. This gunlight usually has three colors; green, red, and white. Basically, this kind of sign lighthas two ways in operating this gun light. In relation to its uses, red color usually consists of two ways in its operation as follows: a) by series flashes dot or on off, on off and b) by turning the red color or it is on and on steadily.

For green color, its operation is the same as red color's ways. However, for white color, it is usually turned on by vice versa or on of, on of. The reason or the cause why white color has only one way to deliver or show to pilots is to differ with surrounding white light. Showing the same delivery in color and ways does not mean the same meaning. In other words, it has a different meaning. It depends on the position or condition of the aircraft, which can receive and see the sign light. As a result, this sign light can create fatal or catastrophic or accidents. This kind of situation is called ambiguity.

The following table from *annex2rules of the air*containsa list of light signs from gunlight, how the airtraffic controller use this sign for the Pilot, and the meaning of the light sign.

TABLE 1. LIGHT AND PYROTECHNIC SIGNALS

Light		From Aerodrome Control to:	
		Aircraft in flight	Aircraft on the ground
Directed towards aircraft concerned (see Figure A1-1).	Steady green	Cleared to land	Cleared for take-off
	Steady red	Give way to other aircraft and continue circling	Stop
	Series of green flashes	Return for landing*	Cleared to taxi
	Series of red flashes	Aerodrome unsafe, do not land	Taxi clear of landing area in use
	Series of white flashes	Land at this aerodrome and proceed to apron*	Return to starting point on the aerodrome
Red pyrotechnic		Notwithstanding any previous instructions, do not land for the time being	

* *Clearances to land and to taxi will be given in due course.*

Gun light has three colors, red light, green light, and white light. It roles semiotically in communication.The meaning of each light depends on how it is delivered to the pilots as follows:

1) Red light

Red light is used by the ATC for a purpose to instruct the pilot in two ways: by off- on and off- on and also by on, on, on continuously. Table 1, instruction sent to the pilot to undertake flying process with making circle which is usually called holding. It aims to give ways to other aircraft close to it, the instruction purposes to stop running. The instruction for not landing because the runway is not safe, and the instruction to get away from runway.

2) Green light

ATC uses the green light to give the pilot instructions in two situations: on-on-off-on and continuous on-on. Table 1 shows these meanings: instructions to the pilot to land, instructions to take off, instructions to fly back to the airport for landing, and instructions to walk.

3) White light

The white light is used by ATC to give instructions to the pilot in only one way, namely off-on-dead-on, which means to land and immediately get off the runway to the plane or flight parakeet.

II. SEMIOTICS AND LANGUAGE FUNCTION

2.1 Semiotics

Semiotics is the study of signs of human life. The term semiotics comes from the Greek word "semeion", which means "sign". Signs are widely used in everyday life as a type of visual language (Eco, 1979; Wicaksono et al. (2020). Signs can be found everywhere, for example,words, traffic lights, flags, etc. In fact, all of them are signs. Ferdinand de Saussure in Sahib, (2017: 45), stated that the theory of linguistic signs and structural semiotics are: 1) a sign can consist of a given (marked) character which is assigned as a value. 2) since language is an arbitrary and conditional social phenomenon which consists of a set of basic social principles and social practices, 3) sign relationships have syntagmatic (present) and associative (non-existent) characteristics. 4) language can be studied diachronically (historical development) and synchronic (at a certain time). 5). language as a social phenomenon can be seen at two levels: language and language. Again Eco (1979) stated that the meaning of the symbol of a language appears when the user of that language places a symbol that gives or an indicator (meaning) and that symbol (meaningful) in a relationship. or cooperate).Since these are linguistic signs, the relationship between signifiers and signifiers is based on social conventions. Language consists of linear symbols located side by side. These settings are based on syntactic relationships.

Another person of Semiotician is Charles Sanders Pearce. He is an American philosopher who developed the philosophy of pragmatism by studying Semiotics. Peirce (1839-1914) observed that signs and meanings that explain them are not perceived based on their structure, but through a cognitive process called Semiosis. So, Semiosis can be described as the process of clarifying meaning and interpreting signs. Pierce claimed there are three aspects of explaining signs. These aspects are called triadic (three levels). Because semiotics is based on concrete things, it is called pragmatic semiotics. This definition becomes clearer when we come to three categories of signs based on the relationship between representation and object. Peirce argues that pragmatic semiotics studies the relationship between intermediate characters, character users, and their use.

Saussure's weakness in developing Semiotics is that he does not discuss the pragmatic aspect of the language, while Pierce's weakness is that he does not explain the langue aspect of the language. in short, Saussure does not see the contextual aspect of language (interactional text, or what is really happening), whereas Pierce does not discuss denotational text of language (what is being said).

Based on the explanation above, the researcher can conclude that the use of semiotics in daily activities has a significant role in producing multilingual meaning for people, objects, sounds, or things.

2.2 Language Function

Language is a very important human communication tool in everyday communication. According to Jacobson in Chandler (2007), language is the center and most important of all human semiotic systems. The language was created by human civilization in accordance with the development of culture, thought, and technology. This is one of the most important things in human life, because humans are social creatures, humans cannot live without interacting with other living things. Language is the way people communicate with each other. Thanks to this communication, be it message transmission or message transmission, language is one of the tools for transmission.

Language is a complex phenomenon that can be studied from several points of view (Shaumyan, 1987, 1). A language is also an object of linguistic study. It focuses on highlighting the language itself as applied to natural languages. According to Lanigan (1991, 186), linguistics is the transmission of verbal messages. It is the scientific study of language itself. There are many sections available in linguistics. It is divided into two parts, the first of which is theoretical linguistics. There are also phonology, morphology, semantics, pragmatics, syntax, semiotics of discourse analysis, etc. On the other hand, for example, there is applied linguistics; sociolinguistics, psycholinguistics, historical linguistics, and others.

Regarding the light sign message between the pilot and the air traffic controller, the light sign serves as a special signal that is sent to the pilot. Using language as the primary means of communicating our thoughts is so natural to many people that it is often difficult to understand what the language actually does. Some of the roles of language are so mundane that they are almost never noticed, others are so sublime, even abstract. Due to their diversity, language functions can be divided into two categories: micro functions, which are specific to individual applications, and macro functions, which serve a broader purpose.

The functions of language in communication are divided into microfunctions and macrofunctions (Finch 1998). The microfunctions are as follows: a) Physiological function (release of physical and nervous energy). Although, surprisingly, the use of this language is quite common, b) Function of fatigue (for socialization). The use of phrases such as “good afternoon” or “how are you” is characterized by a lack of informative content and is intended to bring people together and ensure a peaceful and pleasant coexistence. c) Recording function. This function shows the use the language to take long-term notes of things to remember. Since the ubiquity, according to this theory, writing is perhaps the most important function of a language,d) Identification function. The language is also used to identify objects and events in the world we live in, e) Reasoning function (thinking tool). Before we say something, we think and do it, we must use language. In most cases, it is very difficult to come up with something without words,e) Communication function. This feature is likely to be demonstrated by most users of the language without much attention. In fact, this seems to be the most common language feature used by most speakers. The way of asking, apologizing, informing, ordering, promising and rejecting are all reasons to communicate our ideas, and g) Fun function. The fact that language is often pleasing to both speakers and listeners is not only attested to by the frequent use of assonance, alliteration, and onomatopoeia in poetry.

In addition, macrofunctions are divided into: a) Ideal function. This function refers to the conceptualization process involved in our mental activity. Thanks to language, we can understand what is happening around us. c) Interpersonal function. This function emphasizes that language is primarily a social phenomenon, but in addition to the ability to communicate with others, it allows you to project the speaker in the desired way and represent the speaker. c) Poetic function. According to this function, the word "poetic" does not refer to the ability to create poetry, but to the ability to manipulate language creatively. Using jokes and metaphors, it is the way to play with words and making meanings for fun,d) Textual function. For this kind, it refers to our ability to create coherent and coherent long utterances or fragments of writing. Unlike animals, humans, using certain linguistic tools, can create long sentences and texts, not just simple phrases (Finch 1998).

The functions of language mentioned above are just one of the linguistic points of view. Of course, there are many other functions that natural languages perform, but depending on how you approach this problem, the number of functions and their names may differ.

III. OBJECTIVES OF THE STUDY

Based on the research questions mentioned above, this research aims to fulfil three targets, as follows: 1) To analyze the process of signalmeaning difference from gun light, and 2) To describe how pilots perceive signals from gun lights.

IV. LITERATURE REVIEW

Gun light is one of interesting areas that is very vital to be researched which noticed many researchers to know the gun light itself. There have a number of researchers been talking or discussing about the gun light. The problematic of transferring ideas to each other becomes major topic of people. Its importance is increasing continuously in the future since many researches have been conducted by the expert for indicating the significance of communication concepts as a strategies for make people understand about the meaning.

The first researcher, Mosier et al., (2013)suggest that Pilot – ATC communication is very often encountered conflicts. Although this confllict can result in a good implication. The results show that the workload is high the approach and landing phases are conducive to communication conflicts, that different interpretations of the same information may lead to conflicts, and the operator countries can affect communication and collaboration between flight crew and ATC. The relationship between this research and previous Research is both the research focus on the visible light communication as gun light. However the current study has different focus concerning with the object being observed. The previous study focuses on having communication conflicts between pilots and ATC. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Next,Monechi et al. (2017)stated that Congestion is very often happening in Air Traffic Networks. Their research result shows that the Air Transport system is a complex dynamic network of human-controlled flights that must solve the potential conflict by directing the plane's trajectory. In addition, On increasing the traffic load injected into the system, the model predicts a transition from a phase where all conflicts can be successfully resolved again to a phase where many conflicts cannot be resolved again. The relationship between this research and previous one is that the research focuses on air controll navigation as a medium of communication. However, the current study has a different focus concerning the object being observed. The previous study focuses on Congestion in communication conflicts between pilots and ATC. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Third, Yulian et al.(2016)proposed that the design and implementation of Visible Light Communication Devices As Video Transceiver. Their findings show that in the use of transmitters in the process of sending information given by one person to another is in the form of sound and video. In addition, pilots use LED (visible light communication) as a sign to give meaning to someone in communicating. The relationship between this Research and previous Research is that both focus on the visible light communication as gun light. However, the current study has a different focus concerning the object being observed. The previous study focuses on creating the VLC to support the communication transmitter for the Pilot. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Then, Costello, (2016) claimed that this paper argues for the rediscovery of the human aspect of information systems. This is done by providing an overview of signs and symbols in the literature, specifically from the works of Ferdinand de Saussure and Charles Sanders Peirce. The approach taken is dialogical action research, as it provides a mechanism for implementing change while keeping operational details under the practitioner's control. The relationship between this Research and previous Research is that the Research focuses on air controll navigation as a medium of communication. However, the current study has a different focus concerning the object being observed. The previous study focuses on manufacturing in communication conflicts between pilots and ATC. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Similarly,Trihantoro et al. (2017)suggested the implementation of Visible Light Communication (VlC) for sending the text. Their finding shows that the use of LED lights as a medium in sending information to someone's signal. The signs that are sent are numbers, symbols, and letters to give meaning to pilots so they can communicate more quickly. The relationship between this Research and previous Research is both the research focus on the visible light communication as gun light. However the current study has different focus concerning with the object being observed. The previous study focuses on creating the LED to support the medium of communication. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Next, Costello (2016) argued that for the rediscovery of the human aspect of information systems. It is in line with an overview of signs and symbols in the literature; special from by Ferdinand de Saussure and Charles Sanders Peirce. Then it presented the concept of Organizational Semiotics proposed by Stamper. The findings shows that human behavior is simple and its complexity comes from the environment. The humans communicate through signs, symbols and language and the subsequent actions that derive from these are the most complex aspects of information creation. The relationship between this Research and previous Research is both the research focus on air traffic controller as a medium of gun light to communicate wach others. However the current study has different focus concerning with the object being observed. The previous study focuses on increasing the medium of communication by using sign. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Susanto et al. (2021) in their research entitled *Peranan Air Traffic Control untuk Keselamatan Penerbangan di Indonesia*. Based on the findings, the results show that Air Traffic Controllers ideally have work stress The low one. The high risk of work and involving the lives of many people becomes a burden and responsibility separate responsibility for Air Traffic Controllers. The relationship between this research and previous Research is both the research focus on air traffic controller as a medium of gun light. However the current study has different focus concerning with the object being observed. The previous study focuses on increasing the medium of communication by using air traffic controllers. Then, the current study analyzes the gun light as communication to give the information to the Pilot.

Based on the explanation above, the six researchers discussed the function of the LED which was used as a form of information to the Pilot in focusing on the signal function. In summary, the findings are similar to the current study in that they address the function of the signal addressed to the Pilot. Furthermore, the difference in focus is observed, namely the function of the Gun light which aims to reduce the ambiguity to the Pilot.

V. METHOD

A. Research Design

Descriptive qualitative study will be used to describe how the pilot determined the meaning the signal from the air navigation controller and the Pilot's perception about the signal from the air navigation controller. According to Gay et (2012), a descriptive research design seeks to describe and interpret objects in terms of reality. In addition, a descriptive qualitative research design is employed in obtaining data on behavioral and social phenomenon rather than experimental setting because this research design gives more emphasis on the experiences, meanings, and views of the participants (Lambert & Lambert, 2012). Therefore, it is an appropriate design to obtain the aims of this study by selecting the participants purposefully.

B. Instrument

To obtain the data needed to conduct this research, the instruments prepare to guide the researcher to answer the objectives of this study. The purpose of this study was to identify the meaning of the signal from the Gun light and the Pilot's perception of the signal from the Gun light. The audio recorder will be used as data collection to help researchers analyze the data.

C. Technique of Data Collection

In obtaining the data for the research, direct observation is needed. Through observation, the researcher documented the activities, behaviors, and physical aspects of a situation without having to rely on the ATC operators and pilots' willingness or ability to respond accurately to questions.

D. Procedure of Data Collection

The researcher apply some procedures of collecting data as follows:a) The researcher write a letter to Sultan Hasanuddin Airport management for the research planning and permission, b) After getting permission from the management, the researcher meet the administrative area to find information, and c) The researcher meet the Pilot for discussing the aims of the research.

E. Technique of Data Analysis

The data collected from the instrument will be analyzed qualitatively. In this study, the researcher uses the model from Miles(Miles, et al., 2018) as a technique to analyze the research data. The components of the interactive data analysis model are shown in the following figure:

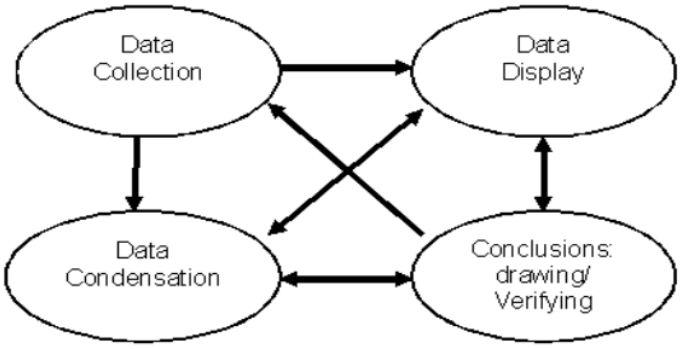

Figure 1 Data Analysis Flow

Based on the Figure 1 the components of the interactive data analysis model are described as following:

1. Data Collection. At this stage, data collection is done from the observation and interview.
2. Data Condensation. The data obtained by researchers through observation and interviews are reduced by summarizing, selecting and categorizing from the data collected.
3. Data Display. The data are presented based on the observation done. Meanwhile the interview technique is done by asking some important data or information which are relevant with the object of the research.
4. Verification. The final step in the interactive qualitative data analysis model is drawing conclusions from the verification process. Based on the data that has been reduced and presented, the researcher drawstentative conclusions baed on a strong evidence.

VI FINDING AND DISCUSSION

a) Visible Light Communication

Visible light is the form in which electromagnetic radiation with wavelengths within a certain range are interpreted by the human brain. The spectrum visible wavelengths from 380 nm to 750 nm. VLC system (visible light communication) is a data communication medium using visible light between 400 THz (780 nm) and 800 THz (375 nm).Visible Light Communications (VLC) is a new paradigm that can revolutionize the future of wireless communications. In VLC, information is transmitted by modulating the visible light spectrum (400-700 nm), which is used for illumination. The information signal is superimposed on the LED indicator without causing flickering to the end-user. Thus, it will be "green" compared to providing two separate sources for lighting and connection to the communication network. In addition, the low-frequency fatigue associated with the exponential growth of high-speed wireless access is another reason to explore new technologies. The visible light spectrum is unlicensed and readily available equipment that can be used to transmit data.

b) Air Traffic Control

ATC (Air Traffic Control) is a complex system, which help maintain order in air traffic, guarantee flight intervals, and prevent plane crash (Li, et al., 2017). In accordance with the with the advancement of technology, there are few people which defines the laws of the air, that the law of air is a seriesnational and international regulations regarding aircraft, air navigation, air transportation commercial and all public legal relations or civil, arising from navigation domestic and international air. Susetyadi & Nurhayati (2012) stated that to carrying out this task requires a ATC officer in traffic flow regulation the air that starts from the plane does first contact (communication) arrived with the aircraft landing at destination airport. Every airport has a building plays an important role as a center for coordinating safety and efficiency of aircraft movement (Pariyan, et al., 2018).

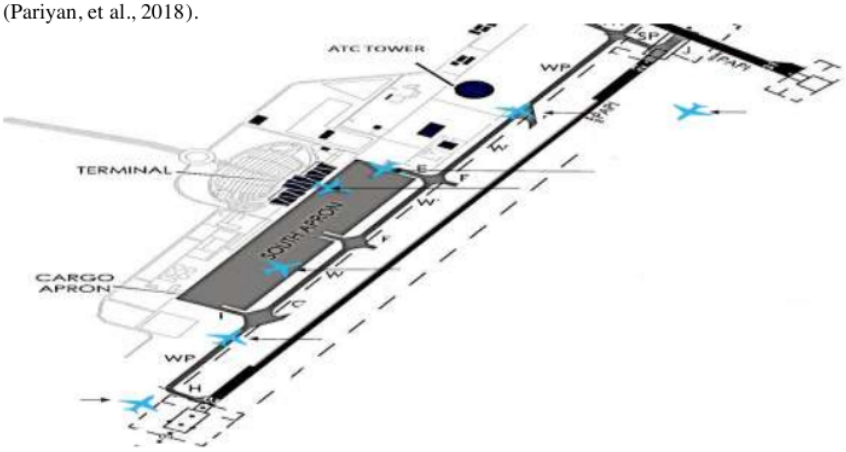

Figure 2 ATC Tower of Hasanuddin Airport

c) Gun light

Gun light is a tool that is used to guide the aircraft when an emergency when the Tower's or aircraft's radio is interrupted. Mode Gun light color emission in flight is governed by established regulations ICAO in Annex 2. Information sent by Air Traffic Controller officers (ATC) using Gun light includes commands for landing, take off, and others and so on, both for aircraft in flight and with vehicles or aircraft on the ground The importance of having a Gun Light in an airport is to be able to assist ATC in providing scouting services when Emergencies are also regulated in the Decree of the Minister of Transportation NO. 44 of 2002 about the

"Airport Arrangement" but currently the operation of the gun light is still using the manual method for operation in this flashing mode of course cause misunderstandings between pilots and ATC officers if the frequency is not right, besides that the operation for changing the color itself is still using manual way by turning the front lever.

Based on the explanation above, the researcher can conclude that the function of the signal coming from the gun light is to represent the meaning of the signal color to make the Pilot quickly understand the function of the deflected color.

d) Semiotics and Language Function

Semiotics and Language Function merupakan dua perspektif yang digunakan untuk menjelaskan light sign communication between pilot and ATC. Komunikasi yang dimaksud di sini adalah penggunaan light sign untuk menyatakan satu maksud. Selain itu, ATC juga menggunakan instruksi untuk menunjukkan apa yang harus dilakukan oleh pilot. Sebagai adressee, pilot membangun komunikasi dengan ATC berdasarkan tanda dan instruksi dari ATC operator.

In relation to the sign system (semiotics), the code and its meaning, refer to figure 2, is read as follows;

TABLE 2. CODES AND MEANINGS

No	Code	Meaning	Position
1	**1 (one)**	a plane is in flight and is about to land	if the aircraft is given a green light on and off, it means it is being instructed to land; however, if the plane is given a red light on and off, it will not land and will fly back to a certain height due to the meaning of the light..
2	**2 (two)**	an airplane is waiting in line to take off from the runway.	The plane will enter the runway if the green light is turned on and off.
3	**3 (three)**	aircraft is already in a ready-to-take-off position.	If the green light is on, the plane will take off because the light indicates to the pilot that it is time to take off. However, whether the red light is on or off, the aircraft will leave the runway via the shortest or safest route deemed safe by the pilot.
4	**4 four**	the plane has safely landed on the tarmac.	In this position, the aircraft requires ATC instructions to exit the runway, so if a red light is flashing, it will turn on and off.
5	**5 and 6 (five and six)**	aircraft walks into and out of the aircraft parking lot, also known as the apron. The red light is on in this position,	the aircraft will stop running because it must immediately stop moving. If, on the other hand, the green light blinks on and off, it is a signal to get back on the road.

Code no 1, the ATC officer's instructions are not to land because the runway is unsafe for landing. However, if a white light sign is turned on and off, the plane will land on the runway and, after landing, will walk out of the runway to the plane's parakeet, known as the apron

About code no 5 and 6, this is happened since this light signal can be seen by two or more aircraft, there is a chance of misinterpretation, which means that another aircraft that is not expected to receive instructions from the light signal sees and follows the instructions. This is due to the fact that the instructions from the light signal have two meanings. As a result, the light sign, as an alternative communication method between ATC and the pilot, still carries the risk of causing a fatal accident due to ambiguity issues.

VII. CONCLUSION

The development of technology should be used to improve the standard of living of humans and the environment. Similarly, the use of technology in the world of aviation. Communication, navigation and surveillance technology (Communication, Navigation, Surveillance) or better known as CNS is an important factor in providing safe and comfortable air transportation.

Based on the discussion of this research thefunction of light sign communication between pilot and ATC in the scope of language function and semiotics analysis memberikontribusipentinguntukpercakapanantarapilot dan ATC operatordengankeselamatanpenerbangan.

Language Function and Semiotics are two important things used to discuss the communication between pilot and ATC in the aviation system. This study combines the aviation systems with linguistics function, and semiotics to interpretet meaning of each the light gun and the meaning depends on how it is delivered to the pilots, such as red light is used by the ATC for a purpose to instruct the pilot in two ways: by off- on and off-on and also by on, on, on continuously. The instruction is sent to the pilot to undertake flying process with making circle which is usually called holding. It aims to give ways to other aircraft close to it, the instruction purposes to stop running. The instruction for not landing because the runway is not safe, and the instruction to get away from runway. Green light to instruct tothe pilot in two situations: on-on-off-on and continuous on-on. The instructions to the pilot to land, instructions to take off, instructions to fly back to the airport for landing, and instructions to walk. While the w**hite light** is used by ATC to give instructions to the pilot in only one way, namely off-on-dead-on, which means to land and immediately get off the runway to the plane or flight parakeet.

The result of this study shows that the understanding in communicating between the Pilot and ATC is very important for flight safety. The failure of light sign communication with the pilot may lead to catastrophic. The implication of this study will increase the awareness of how important it is to maintain a communication system when flying for flight safety

In the end, the aviation communication system will apply what is called CNS (Communication, Navigation, Surveillance). Mastery of satellite-based technology becomes absolute for the demands of the development of CNS applications due to the ability to reach and capacity and the speed of data transmission is large and fast

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