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# Safety Perception in Flight Training a Q-Methodology Study on ICPA of Banyuwangi

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**ABSTRACT**

A Safety Management System (SMS) cannot run without the support of other components. The key to successful SMS implementation lies in the alignment of operational systems, technical management, and human resources. Flying schools in Indonesia were recorded to have contributed to 20 accidents and serious incidents. This study aims to describe safety at the Indonesian Civil Pilot Academy in Banyuwangi, where regulations have been implemented, school leaders are committed to a safety management system, and the system is supported by adequate technology. The study employed a qualitative method based on Q Methodology. Qualitative research was chosen to facilitate the review of perspectives on the implementation of safety management systems and to assess respondents' perceptions. Respondents in this study were key personnel from PSC 141–014, senior pilot students, and pre-solo pilot students, with a total of 7 respondents. Respondents were selected using purposive sampling. Respondents completed a Q-sort with 33 statements/courses. The respondent's Q-sort results were processed using the KADE application. The consensus results, both most agreeing and most disagreeing, indicate that safety perceptions are based on two factors: self-awareness and the role of the organization, specifically leadership, in building and developing a safety culture, including a just culture. To promote a safety culture, including a just culture, the organization ensures that internal safety audits are conducted by competent, adequately trained personnel. The development of a safety culture will be more effective if regulators are involved in establishing safety culture indicators and in using them as assessment indicators through audits or surveillance.

**Reccomended Citation**:

APA Style



## INTRODUCTION

Air transportation is a vital component of the global economy. This industry has transformed from a start-up with a weak safety track record to an ultra-safe system, thanks to the aviation community's continued investment in building safety (ICAO, 2014). Over the past 60 years, accident prevention efforts have focused on detailed analysis of each incident to design measures that prevent recurrence. (Martin, 2025). The International Civil Aviation Organization (ICAO) requires all airline operators to integrate

safety management by adopting a Safety Management System (SMS) across all operations. (Stroeve et al., 2022).

A Safety Management System (SMS) is the process of effectively managing and reducing risks associated with aviation activities, both in aircraft operations and in supporting functions (Kıvanç et al., 2025a). SMS cannot operate without the support of other components, as the key to successful SMS implementation is a harmonious combination of operational systems, technical management, and human resources (Wittmer & Müller Roland, 2014).

The period 1996–1999 marked the first application of SMS on the Leonardo da Vinci project, a case study that underscores the importance of integrating quality, environmental, and total quality management systems with implementation methodologies that continued to evolve until the early 2000s (Labodova, 2001). The development of research on SMS can improve the level of aviation safety and can reduce the annual aviation accident rate by implementing 4 pillars of SMS, that is Safety Policy and Objective, Safety Risk Mangement, Safety Assurance and Safety Promotion (Martin, 2024).

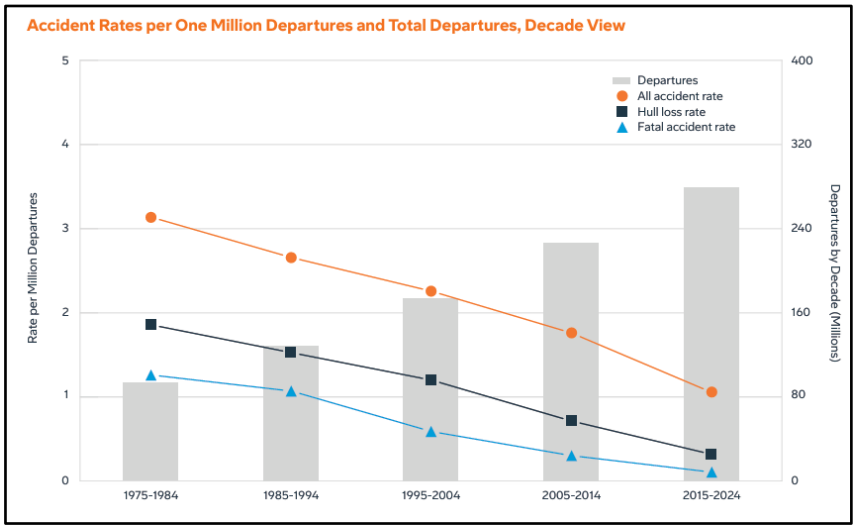


Figure 1. Accident Event on a Commercial Jet Flight 2024
Source: (Martin, 2024)

One of the aircraft manufacturers, The Boeing Company, reported that accidents that occurred in 1975-2024 in the Statistical Summary of Commercial Jet 2024 continued to experience a decrease of 40%, hull loss decreased by 55%, fatal accidents also decreased by 65%, offset by a 23% increase in aircraft arrivals, which can be seen in Figure 1 (Martin, 2025).

In 2018, Indonesia recorded an accident with more than 100 fatalities (Febriani, 2017). Meanwhile, flight schools in Indonesia were recorded as having contributed 20 accidents and serious incidents recorded in the NTSC report (see table 1). In order to increase the Acceptable Level of Safety (AloS), ICAO requires all member countries to develop a National State Safety Program. Indonesia implementing the State Safety Program (SSP) Framework issued by ICAO in the Worksheet of the Thirteenth Air Navigation Conference in Montréal, Canada (DGCA, 2018).

Since its first audit by ICAO in 2007, Indonesia underwent a full USOAP-CMA audit in 2014, with an effectiveness score of 43.02%, which increased to 49.06% after desktop validation. In 2017, through the ICVM mission, Indonesia's EI score rose significantly to 78.85% (based on the 2020 edition of the USOAP PQ), surpassing the APAC (63.62%) and global (69.54%) averages. However, of the 147 audit findings, only 74 Community Action Plans (CAPs) had been completed by the end of 2022, indicating a persistent weakness in the safety oversight system (see Figure 2). Therefore, prompt resolution of these findings is crucial to avoid a "State Safety Concern" status. Active collaboration between the DGCA, airport authorities, airlines, airport operators, air navigation providers, and the National Transportation Safety Committee (NTSC), relevant ministries, and non-governmental organizations is key to strengthening the safety system and supporting the sustainable growth of national aviation (Siswantoro, 2023).

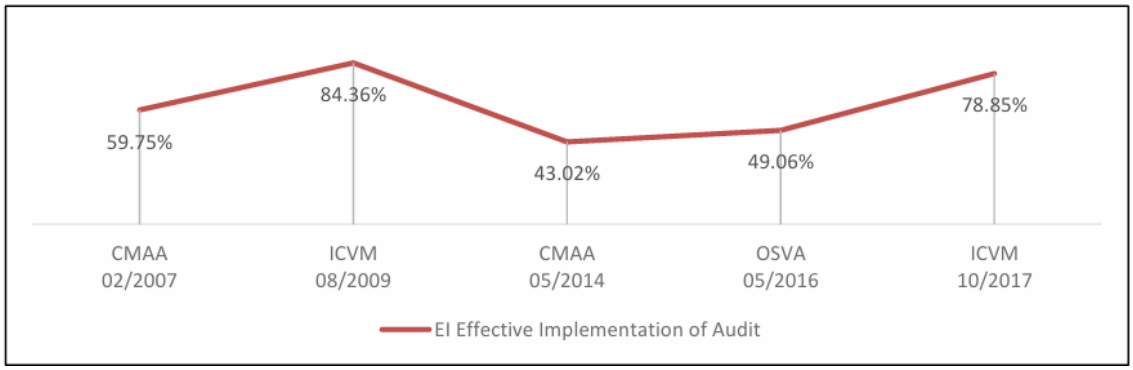


Figure 2. Effectiveness of ICAO Audits
Source: (DGCA, 2018)

At a lower level, particularly in flight schools, including pilot school certification (PSC), the DGCA, in this case the DKUPPU, conducts certification, audits, and surveillance to ensure the quality of pilot education, including safety implementation. These activities ensure that aviation safety commitments and quality assurance for flight training meet minimum requirements. However, accidents and incidents continue to occur during flight training activities in Indonesia. The following table presents accidents at flight schools between 2010 and 2020.

Table 1. Accidents and serious incidents originating from flight training activities

| Year | Case | A/C Registration | Type of A/C |
|---|---|---|---|
| 2010 | Runway Incursion | PK AGU | Socata Tobago TB-10 |
| 2010 | System Failure | PK ROG | Cessna 172 |
| 2010 | Fatal Accident (wind shear/thunderstorm) | PK AGM | Socata Tobago TB-10 |
| 2012 | Collision During Take Off and Landing | PK ROI | Cessna 172 |
| 2013 | Accident (Swallow at the Sea) | PK KFC | Cessna 152 |
| 2013 | Runway Excursion | PK IUA | Cessna 172 |
| 2014 | Abnormal Runway Contact | PK AEE | Piper Warrior III |
| 2014 | Abnormal Runway Contact | PK BOB | Cessna 172 |
| 2014 | System/Component Failure or Malfunction | PK MSN | Cessna 172 |
| 2015 | System/Component Failure or Malfunction | PK LLA | Liberty XL2 |
| 2016 | Runway Excursion | PK TGL | Cessna 172 |
| 2016 | System/Component Failure or Malfunction | PK NIV | Cessna 172 |
| 2016 | Runway Excursion | PK HAN | Cessna 172 |
| 2016 | System/Component Failure or Malfunction | PK PBH | PA-28-161 |
| 2016 | System/Component Failure or Malfunction | PK NIZ | Cessna 172P |
| 2016 | Runway Excursion | PK AGV | Socata Tobago TB-10 |
| 2017 | Abnormal Runway Contact | PK MUA | Cessna 172S |
| 2017 | Abnormal Runway Contact | PK PBO | Piper PA 28-161 |
| 2017 | Runway Excursion | PK ARH | Piper PA 28 |
| 2020 | Runway Excursion | PK SNR | Cessna 172 |

Source: NTSC of Indonesia

Worker behavior patterns are a sign of safety culture, so workforce behavior directly reflects the organization's safety culture. If a safety culture is empowered, employees will act in accordance with safety principles (Fugas et al., 2012). A safety culture is built through leadership, employee participation, and the integration of safety into all business processes, which is realized through a safety system (Wicaksono et al., 2024). Although companies have committed to safety through routine communication, in reality, safety is often neglected due to project priorities influenced by demographic factors such as education level, work experience, and employment status (Kadir et al., 2022a).

Addressing Normalization of Deviation (NoD) requires a comprehensive understanding of the internal and external factors that trigger the problem to minimize accidents. (Xu et al., 2024). Indonesia's safety culture is considered quite good, but commitment and collaboration from the organizational, project, and national regulatory levels are still needed as a first step in creating better safety. (Lestari et al., 2020).

The Indonesian Civil Pilot Academy (ICPA) in Banyuwangi, as holder of PSC 141-014 certification, implements all safety concepts and assurance measures, including the establishment and operation of a safety management system. The Indonesian Aviation Academy Banyuwangi is supported by good regulations with periodic internal and external audits, the latest technology, trained personnel who have licenses and sufficient flight hours/experience, and the most important is that the leaders commit to safety and represent at declaration or testimony like "The sky is vast but no room for error" or "safety maintained by good preparation". However, based on table 1 above, the Indonesian Civil Pilot Academy (ICPA) of Banyuwangi, although small, still contributes to several accidents and the most recent incident was the PK-BYK which made an emergency landing on the edge of Gumuk Kantong Beach - Muncar - Banyuwangi. Therefore, the research question arises:

RQ: What is the perception of flight operation safety at the Indonesian Civil Pilot Academy of Banyuwangi?

This study aims to describe the safety picture at flight schools in Indonesian Civil Pilot Academy of Banyuwangi where regulations have been implemented and school leaders are committed to implementing a safety management system and are supported by adequate technology.

## METHOD

The research method used in this study was qualitative. Qualitative research was chosen to facilitate the review of perspectives on safety management system implementation and to assess respondents' perceptions of its implementation. (Lazazzara et al., 2020; Sebele-Mpofu, 2020). The informants used in this study were flight instructors and student pilots. Selecting the most appropriate and balanced informants is crucial in qualitative research to ensure that the information obtained is unbiased. (Rijal Fadli, 2021).

The selection of informants used a purposive sampling technique where the primary informants were the chief (Key Person) at PSC 141, senior pilot students, and pre-solo pilot students. The respondents in this study were key personnel from PSC 141-014 ICPA in Banyuwangi. Meanwhile, for pilot students, there were three respondents: senior students with more than 180 hours, pilot students who had reached the CPL phase, and pilot students who had completed the pre-solo stage. There are only 7 respondents in this study, each with a different background as described above. 7 respondents are sufficient for this research, as each respondent represents a function and a level of flight training at the Indonesian Civil Pilot Academy in Banyuwangi.

Data analysis techniques using Q-sort by using Q methodology. The first mechanism carried out is to determine the number of columns in the Q-Sort and determine the statement/concourse that will be used for Q-Sort (Coogan & Herrington, 2011; Watts & Stenner, 2005; Zabala et al., 2018). In this study, 33 Q-sorts were determined, followed by 33 Concourses. Each respondent was given a Q-Sort table (Q grid) and 33 statements/concourses, and each respondent was given the freedom to determine the statements in the available Q-sort. The statement or course chosen in this research is the primary topic of safety management material delivered in the SMS course. A statement or discourse may introduce a new concept, such as practical drift.

Table 2. Statements on Q – Sort

| Statement / Concourse | References |
|---|---|
| Practical drift is real in aviation. | (Schaap, 2022; York et al., 2022) |
| Every person/personnel has the potential to make mistakes | (Pettersen & Schulman, 2019) |
| Procedures are always followed without exception. | (Di Nardo et al., 2020) |
| Several procedures in flight operations were violated. | (Martin, 2025) |
| Flight operations are conducted in accordance with safe procedures. | (Stroeve et al., 2022; Su, 2021) |
| Technology can reduce the potential risk of accidents. | (Kim et al., 2019; Li & Guldenmund, 2018) |
| The regulations set are binding. | (Kıvanç et al., 2025b) |
| All flight personnel understand safety regulations and procedures. | (Kešeľová et al., 2021) |
| Existing hazards and risks have been identified. | (Kartal & Bayramoğlu, 2024; Machfudiyanto et al., 2020) |
| Accidents and incidents on flights often occur due to small things (errors). | (Ziakkas et al., 2023) |

| Statement / Concourse | References |
|---|---|
| The organization always promotes safety | (Kadir et al., 2022b) |
| The organization's leadership focuses on aviation safety. | (Oktivaningsih et al., 2025) |
| The organization's leadership prioritizes aviation safety. | (Ayiei et al., 2020; Prasad Bastola, 2020) |
| Latent conditions are an important thing to pay attention to. | (Chan & Li, 2023; Xing et al., 2024) |
| Safety management system has been implemented well. | (Key et al., 2023) |
| The technology used makes it easy to carry out procedures. | (Dincer, 2023) |
| I never did anything wrong. | (Chan & Li, 2023) |
| I always comply and never violate procedures. | |
| I pay attention to small things that can reduce the level of safety. | (Xiong et al., 2024) |
| Flight safety training has been provided periodically. | (Senaj & Jůn, 2023) |
| Safety promotion is carried out continuously. | (York et al., 2022) |
| I understand very well that practical drift will occur even if all components of achieving safety are met. | (Schaap, 2022; York et al., 2022) |
| The organization implements just culture (no blame). | (Coban & Bukec, 2024; Woodlock, 2022) |
| All activities have procedures | (Yılmaz, 2025) |
| All personnel have understood the most basic safety concepts. | (Xiong et al., 2024) |
| Latent conditions are dangerous conditions. | (Xiong et al., 2024) |
| Mistakes will still occur even under the safest conditions. | (Xing et al., 2024) |
| Accidents and/or incidents can occur even if adequate defenses are in place (regulation, technology and training). | (Pettersen & Schulman, 2019; Schaap, 2022) |
| I have implemented the simplest safety culture, such as not smoking at work. | (Woodlock, 2022) |
| Safety is the absence of danger and risk. | (Karanikas et al., 2020) |
| Safety has been assessed and measured annually. | (Provan et al., 2020) |
| Safety performance indicators have been established. | |
| Implementation of internal and external audits and surveillance improves safety culture. | (Stroeve et al., 2022) |

The results of the safety perception assessment by respondents were processed into Excel and put into KADE application to view the consensus statement results in the Q-Sort table (Q grid). The KADE application will process data in the form of Q-sort data input, correlation between respondents, factor analysis, varimax and factor rotation, factor loading calculations, and finally, the consensus display from the Q-sort (Clausen et al., 2021; Rahma et al., 2020). See Figure 3.

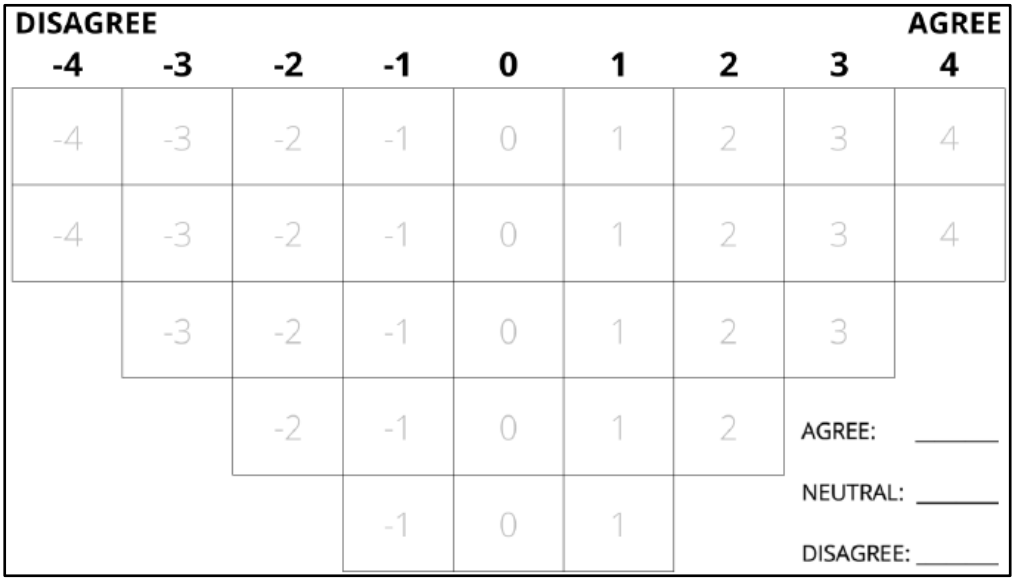


Figure 3. Q grid as a tool for Q sort in this research
Source: (Chikudza et al., 2020; Zabala et al., 2018)

After the consensus results from the KADE application were obtained, based on the differences in the consensus results, especially between the extreme right (strongly agree) and extreme left (strongly disagree), a Focus Group Discussion was conducted to discuss the topic. To understand the mechanism and flow of thought in this study, see Figure 4 below.

The research was conducted from May to July 2025, while the focus group discussion was conducted on July 28, 2025. The focus group discussion only invited key persons from PSC 141 ICPA of Banyuwangi as mentioned above.

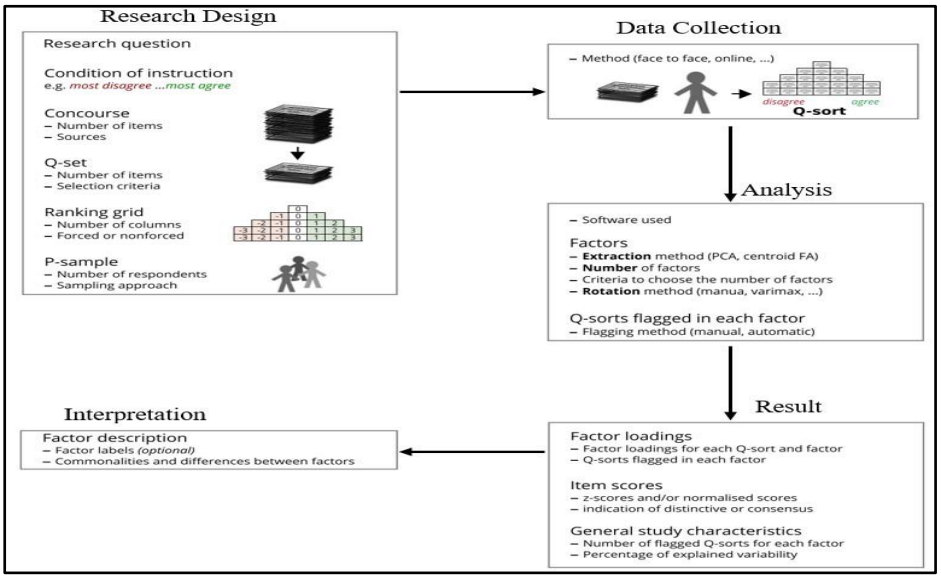


Figure 4. Thinking Framework
Source: (Chikudza et al., 2020; Zabala et al., 2018)

## RESULTS AND DISCUSSION

The results of respondents' completion and selection of the Q-sort table were converted into Microsoft Excel data and entered into the KADE V1.3.1 application. The initial step after entering the data and verifying that there are no data errors is to assess the correlation among respondents. The correlation results for respondents in this study are as follows.

Table 3. Correlation between respondents

| Participants | R1 | R2 | R3 | R4 | R5 | R6 | R7 |
|---|---|---|---|---|---|---|---|
| R1 | 100 | 41 | 22 | 19 | 30 | 33 | 31 |
| R2 | 41 | 100 | 59 | 52 | 61 | 51 | 69 |
| R3 | 22 | 59 | 100 | 57 | 36 | 55 | 53 |
| R4 | 19 | 52 | 57 | 100 | 38 | 59 | 51 |
| R5 | 30 | 61 | 36 | 38 | 100 | 54 | 61 |
| R6 | 33 | 51 | 55 | 59 | 54 | 100 | 47 |
| R7 | 31 | 69 | 53 | 51 | 61 | 47 | 100 |

Source: Output KADE

In the Q method, the correlation between respondents (Q correlation) is used to identify similarities or differences in thought patterns, perceptions, or attitudes among participants. (Nguyen & Waller, 2022; Wei et al., 2020). This analysis helps researchers group respondents with similar views into categories, such as "factors" or "personality types," thereby enabling analysis of within-group variation and how those views may relate to participant characteristics. (Ghojogh et al., 2023; Rieber, 2020).

After calculating the correlation, the next step is to calculate the factor size for each respondent's opinion using principal component analysis. The results of the unrotated factor size calculation are as follows:

Table 4. Unrotated Factor Matrix

| Participant | Fac. 1 | Fac. 2 | Fac. 3 | Fac. 4 | Fac. 5 | Fac. 6 | Fac. 7 |
|---|---|---|---|---|---|---|---|
| R1 | 0.4811 | 0.7463 | 0.4424 | -0.0634 | 0.0577 | 0.0256 | -0.088 |
| R2 | 0.8498 | 0.1095 | -0.1479 | -0.2583 | -0.0336 | -0.3027 | 0.2906 |
| R3 | 0.751 | -0.3422 | 0.224 | -0.2902 | -0.3833 | 0.019 | -0.1927 |
| R4 | 0.7357 | -0.403 | 0.2545 | 0.0639 | 0.4484 | -0.1236 | -0.1053 |
| R5 | 0.7429 | 0.2079 | -0.4668 | 0.3188 | -0.0721 | -0.1365 | -0.2479 |
| R6 | 0.7754 | -0.1109 | 0.2196 | 0.4907 | -0.1635 | 0.148 | 0.221 |
| R7 | 0.8097 | 0.0407 | -0.3287 | -0.2425 | 0.1719 | 0.3806 | 0.0376 |
| Eigenvalues | 3.8678 | 0.9057 | 0.7068 | 0.5602 | 0.414 | 0.2934 | 0.2521 |
| % exp. var. | 55 | 13 | 10 | 8 | 6 | 4 | 4 |

Source: Output KADE

The results of the factor loading of each respondent's assessment found that the highest eigenvalues were 3.8678 in factor 1 and followed by 0.9057 in factor 2. Of the 7 existing factors, those that can be continued are factors with eigenvalues greater than 1 (Fan et al., 2022; Johnstone, 2001; Weiss et al., 2023). Eigenvalues are a factor analysis that is calculated to determine how many factors will be extracted from the total factor analysis (J. D. Brown, 2001).

Eigenvalue analysis is a crucial determinant in Q-Method analysis, determining the number of factors to be subjected to Varimax rotation (Clausen et al., 2021; Johnstone, 2001; Ke et al., 2023). Varimax is the most common rotation technique in statistical analysis. To simplify factor interpretation, this orthogonal rotation minimizes the number of variables with high loadings for each factor (Akhtar-Danesh, 2023). In fact, for each factor, this rotation maximizes the variance of its loadings by making high loadings higher and low loadings lower (Akhtar-Danesh, 2023; Nguyen & Waller, 2022). To more clearly see the distribution of eigenvalues in this study, see the screeplot (Figure 5) below.

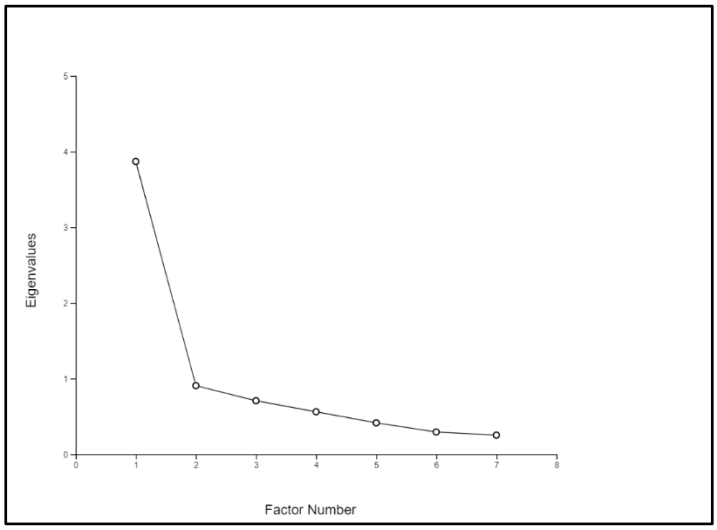


Figure 5. Screeplot Eigenvalues
Source: Output KADE

The factor loadings are rotated using varimax rotation, placing the two main loading factors into consensus in the Q-Sort. The value of the largest of the two loading factors will be marked

(flagged) with a significance value of p>0.05. The results of the factor loading that has been rotated using the varimax method and marked (flagged) can be seen in the following table:

Table 5 Flagged factor Loading

| No | Q-sort | F1 | F2 |
|---|---|---|---|
| 1 | R1 | 0.0253 | 0.8876 |
| 2 | R2 | 0.6705 | 0.5336 |
| 3 | R3 | 0.8197 | 0.0959 |
| 4 | R4 | 0.8381 | 0.0361 |
| 5 | R5 | 0.528 | 0.5624 |
| 6 | R6 | 0.7209 | 0.3065 |
| 7 | R7 | 0.6717 | 0.454 |

After the two factor loadings are flagged, the next step is to pull the data from the two factor loadings into each statement/concourse to calculate the Z score and rank them to determine the consensus value of each statement to obtain the final consensus data in the Q-Sort display. The Z score describes how many standard deviations a measurement is above or below the population mean (Curtis et al., 2016; Wei et al., 2020). The results of the Z-score calculation that correspond to the statement are as follows:

Table 6. The Z-score value and level for each statement.

| No | Statement / Concourse | F1 | | F2 | | Diff. |
|---|---|---|---|---|---|---|
| | | Z Score | Rank | Z Score | Rank | |
| 1 | Practical drift is real in aviation | 1.29 | 5 | 0.74 | 9 | 0.549 |
| 2 | Every person/personnel has the potential to make mistakes | 1.32 | 4 | 1.91 | 1 | -0.593 |
| 3 | Procedures are always followed without exception. | -1 | 28 | -0.67 | 25 | -0.328 |
| 4 | Several procedures in flight operations were violated. | 0.54 | 12 | 0.08 | 18 | 0.457 |
| 5 | Flight operations are carried out with safe procedures. | 0.44 | 13 | 1.49 | 3 | -1.057 |
| 6 | Technology can reduce the potential risk of accidents. | 0.86 | 10 | 0.33 | 13 | 0.531 |
| 7 | The regulations set are binding. | 0.24 | 15 | 0.66 | 11 | -0.423 |
| 8 | All flight personnel are familiar with safety regulations and procedures. | -0.82 | 25 | 0.67 | 10 | -1.488 |
| 9 | Existing hazards and risks have been identified. | -0.37 | 19 | 1.08 | 5 | -1.449 |
| 10 | Accidents and incidents on flights often occur due to small things (errors). | 1.22 | 7 | 0.83 | 6 | 0.393 |
| 11 | The organization continually promotes safety | -0.25 | 17 | 0.17 | 15 | -0.423 |
| 12 | The organization's leadership focuses on aviation safety. | -1.1 | 29 | -0.25 | 19 | -0.856 |
| 13 | The organization's leadership prioritizes aviation safety. | -0.94 | 27 | -0.66 | 24 | -0.278 |
| 14 | Latent conditions are important to consider. | 1.23 | 6 | 0.75 | 8 | 0.485 |
| 15 | The safety management system has been implemented well. | -0.07 | 16 | 0.25 | 14 | -0.317 |
| 16 | The technology used facilitates the execution of procedures. | 0.63 | 11 | 0.16 | 16 | 0.462 |
| 17 | I never did anything wrong. | -1.61 | 32 | -1.25 | 29 | -0.357 |
| 18 | I always comply and never violate procedures. | -0.34 | 18 | 1.33 | 4 | -1.666 |
| 19 | I pay attention to small things that can reduce the level of safety. | 0.29 | 14 | 0.83 | 7 | -0.542 |
| 20 | Flight safety training has been provided periodically. | -0.55 | 22 | -0.42 | 22 | -0.137 |
| 21 | Safety promotion is carried out continuously. | -0.45 | 20 | -0.91 | 27 | 0.459 |
| 22 | I understand very well that practical drift will occur even if all components of achieving safety are met. | 0.91 | 9 | 0.58 | 12 | 0.326 |
| 23 | The organization implements just culture (no blame). | -1.74 | 33 | -1.83 | 32 | 0.092 |

| No | Statement / Concourse | F1 | | F2 | | Diff. |
|---|---|---|---|---|---|---|
| | | Z Score | Rank | Z Score | Rank | |
| 24 | All activities have procedures | -0.72 | 24 | -0.5 | 23 | -0.221 |
| 25 | All personnel have demonstrated understanding of the most basic safety concepts. | -1.2 | 30 | 1.58 | 2 | -2.781 |
| 26 | Latent conditions are dangerous conditions. | 1.66 | 1 | -0.33 | 20 | 1.995 |
| 27 | Mistakes will still occur even under the safest conditions. | 1.44 | 3 | -1.25 | 30 | 2.69 |
| 28 | Accidents and/or incidents can occur even if adequate defenses are in place (regulation, technology, and training). | 1.46 | 2 | -0.33 | 21 | 1.79 |
| 29 | I have implemented the simplest safety culture, such as not smoking at work. | -0.66 | 23 | -0.75 | 26 | 0.093 |
| 30 | Safety is the absence of danger and risk. | -1.29 | 31 | -0.91 | 28 | -0.376 |
| 31 | Safety has been assessed and measured annually. | -0.47 | 21 | -1.99 | 33 | 1.519 |
| 32 | Safety performance indicators have been established. | -0.88 | 26 | -1.58 | 31 | 0.694 |
| 33 | Implementation of internal and external audits and surveillance improves safety culture. | 0.92 | 8 | 0.16 | 17 | 0.754 |

Diff. = Different
Source: Output KADE

As seen in Table 6 above, the Z-Score is obtained from each statement/concourse, so that from the Z-score value, a ranking can be given (Wei et al., 2020). The results of this ranking will be entered into a Q-Sort table (Q grid), where those who get the highest Z-Score will be placed in the rightmost table with the conclusion of strongly agree and successively to the lowest Z-Score in the leftmost table with the conclusion of strongly disagree (M. Brown, 2004; Rieber, 2020b; Steelman & Maguire, 1999). The results of the Z-score ranking consist of 2 factor loadings, so there are 2 consensus conclusions in this study. To make it easier to understand table 6 above, it can be seen in figures 6 and 7 below.

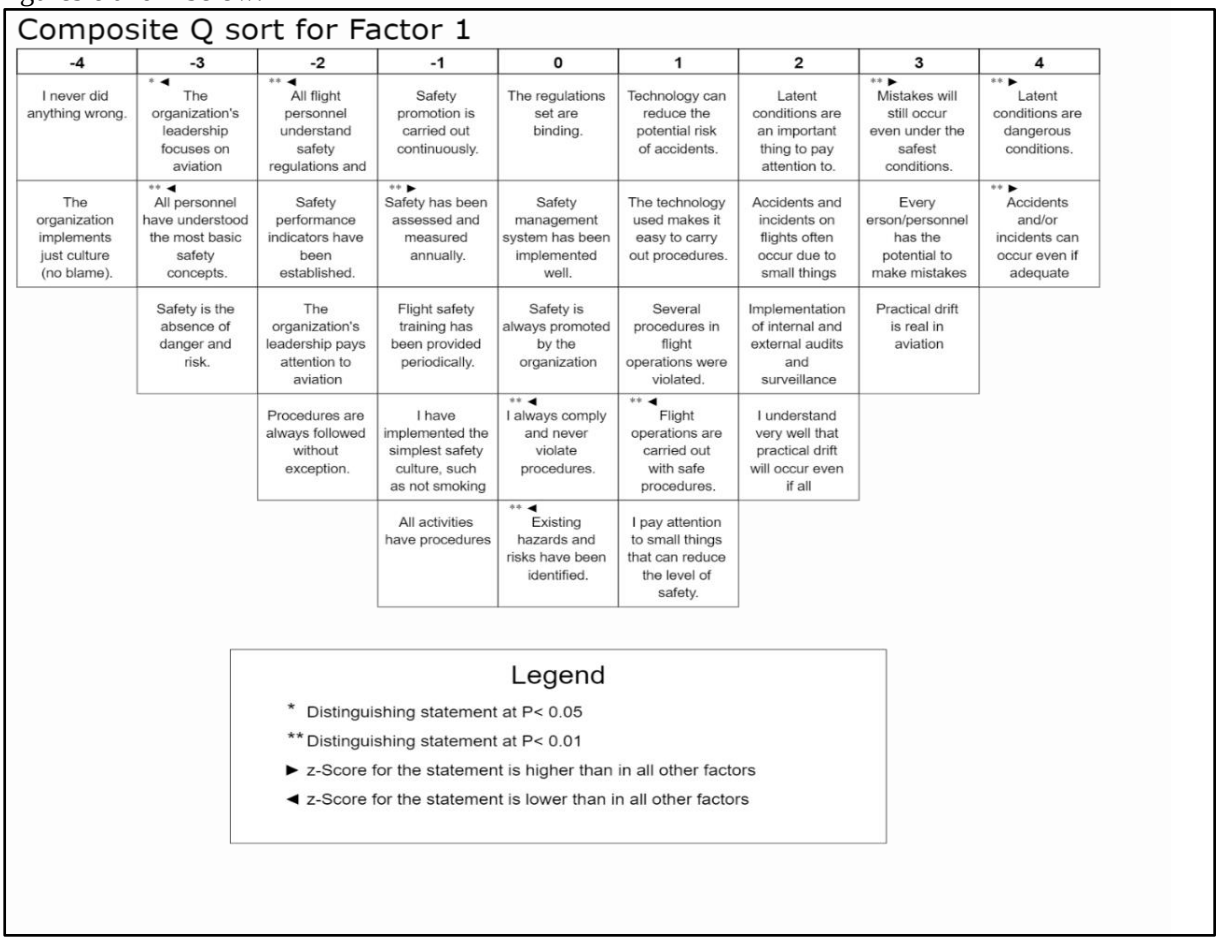

Figure 6. Consensus Results of Factor Loading 1

Based on Figure 6 above, it is found that loading factor 1. the consensus results from those who most agree to those who most disagree respectively, as follows:

1. Latent condition are dangerous conditions (most agreed);
2. Accidents and/or incidents can occur even if adequate defenses are in place (regulation, technology and training) (most agreed);
3. I never did anything wrong (most disagreed); and
4. The organization implements just culture (no blame) (most disagreed).

Meanwhile, in the second loading factor as seen in Figure 7 below, the consensus results from those who most agree to those who most disagree are as follows:

1. Every person/personnel has the potential to make mistakes (most agreed);
2. All personnel have understood the most basic safety concepts (most agreed);
3. The organization implements just culture (no blame) (most disagreed); and
4. Safety has been assessed and measured annually (most disagreed).

Based on the results of the consensus on both loading factors 1 and 2, it was found that there were similarities, especially in the statement "The organization implements just culture (no blame)" which both expressed disagreement with the statement. To dig for more in-depth information and perspectives, the researcher conducted interviews on focus group discussions with respondents who were key persons from PSC 141 ICPA of Banyuwangi, whose names were disguised as P1, P2, P3 and P4 in order to protect the privacy of the person concerned.

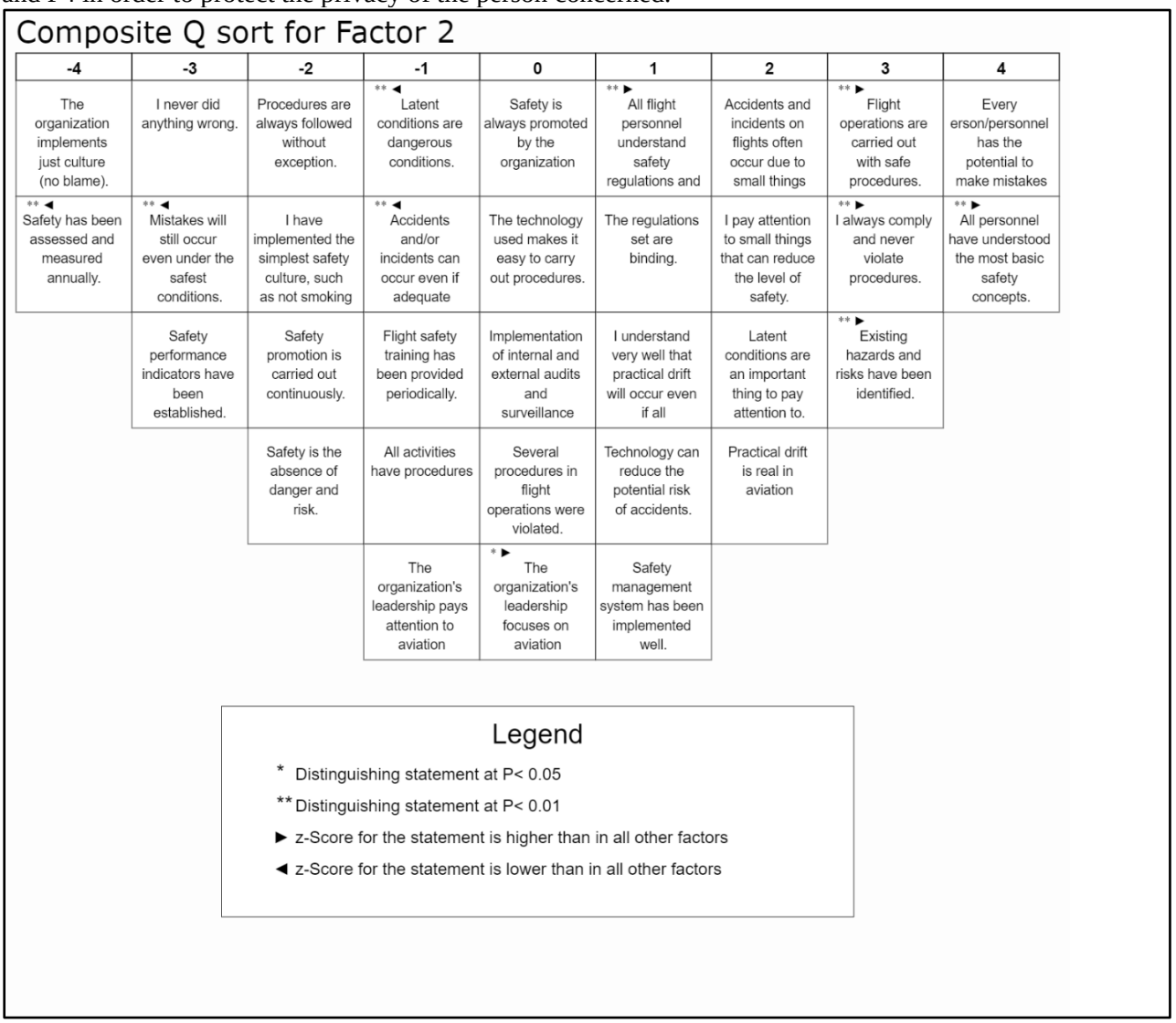

Figure 7. Consensus Results of Factor Loading 2

The discussion topics in this focus group discussion were differentiating statements between the extreme right (strongly agree) and extreme left (strongly disagree). The topics were as follows:

1. All person/personnel have the potential to make mistakes (most agreed);
2. All personnel have understood the most basic safety concepts (most agreed);
3. Latent condition are dangerous conditions (most agreed);
4. Accidents and/or incidents can occur even if adequate defenses are in place (regulation, technology and training) (most agreed);
5. I never did anything wrong (most disagreed);
6. The organization implements just culture (no blame) (most disagreed);
7. Safety has been assessed and measured annually (most disagreed);

The focus group discussion was conducted on July 28, 2025, and focused on the seven topics identified above, which were derived from a consensus of respondents' perceptions using the Q-Methodology. The overall results of the focus group discussion are presented in Table 7.

The results of this study on perceptions of flight safety reflect the conditions experienced by flight operators at ICPA Banyuwangi. It is notable that the consensus opinion on both factors 1 and 2 most strongly disagrees with the statement that "The organization implements just culture (no blame)". This is noteworthy because ICPA Banyuwangi is among the organizations that provide flight training. Based on the data in Table 1. ICPA of Banyuwangi experienced the fewest incidents; the only accident was the ditching of PK-BYK at Gumuk Kantong Beach, which did not result in any fatalities.

Table 7. FGD results on 7 topics

| Topic | Respondent / Participant | | | |
|---|---|---|---|---|
| | P1 | P2 | P3 | P4 |
| **Most agree** | | | | |
| Latent conditions are dangerous conditions. | An accident is triggered by small thing | The most obvious example of a latent condition that occurs is like the engine cowling opening during flight due to a lack of pre-flight or even the instructor not accompanying the student in pre-flight | Culture justifies what is normal instead of getting used to what is right | Latent triggers something big conditions (accidents/incidents) |
| Accidents and or incidents can occur even if adequate defenses are in place. | Definitely, because humans are individuals. Humans have limitations like Physical limitations, emotional limitations, etc | There are a lot of factor that we cannot control. That could possibly lead to an accident or incident even though we have strictly monitored it. | Bad habits lead to latent conditions and lead to accidents or incidents. | |
| Every individual has the potential to make mistakes | Every participant not argued with the statement | | | |
| All personnel have mastered the most basic safety concepts | If we talk about the basic, we must talk about just culture again and make sure that culture | Disagree, if this statement not only flight operation personal or flight operation supporters | I agree, everyone understands, whether the violation still occurs or not is a different matter. | Reporting hazards is a culture that must be implemented if we want to reduce the potential hazard, even if the person reporting it accidentally carries out the dangerous activity. |
| **Most disagree** | | | | |
| I never did anything wrong | “I'm always right” is hazardous. | That actually happened to me. when we became seniors, sometimes we'd | The only problem is that you have to admit your mistake | It was Complacency |

| Topic | Respondent / Participant | | | |
|---|---|---|---|---|
| | P1 | P2 | P3 | P4 |
| | | say, "Oh, I can do this. Just to be cool of." | | |
| The organization has implemented a just culture | It seems like Just Culture itself in our organization is still not appropriately implemented. it's still taboo in our country. so people keep it to themselves | Just culture has not yet become a culture, because latent dangers are still frequently encountered and tend to be ignored due to fear of speaking out. Because there's still a fear of being blamed | Many employees are reluctant to report because, each time a report is submitted, they're the ones who must complete it. So They are lazy to report something that is out of the ordinary | Other people resist and deny it. Not only will reporting lead to people being accused of doing wrong, but secondly, when we report, it turns out that others are offended |
| Safety has been assessed and measured annually | Regarding safety audits, they're actually conducted annually, every two years during the PSC renewal. But again, safety is actually something that isn't paid close attention enough. | Actually, there already is. It's in the manual. But this safety audit has never been implemented. When the operational run well, they think that safety goes well too. | No man has safety auditor or investigator certifications. | The regulator itself need to more concerned about safety. |

Based on the results of focus group discussions, it was revealed that it remains taboo for personnel to discuss safety, and most importantly, a reporting culture has not been fully implemented. This is because when they report, the burden of resolving the report falls back on the reporter, and worse, the reporter is blamed for the unpleasant report. This contrasts with the concept of a just culture, which should provide opportunities and recognition to reporters (Coban & Bukec, 2024; Woodlock, 2022).

Safety culture is an index of how many employees perceive that the organization emphasizes safety values at all levels, from line management to leadership (Key et al., 2023). Just Culture is a system of shared accountability in which organizations and individuals are held accountable for their mistakes and behavior, but in a fair, honest, and balanced manner, focused on learning and improving the system, not on punishment alone (Coban & Bukec, 2024; Woodlock, 2022). Therefore, based on this definition and the existing consensus, ICPA of Banyuwangi is still far from perfect in implementing a just culture.

Another interesting statement on the most disagree side is "I never did anything wrong." All participants agreed to disagree with this statement. This is because they have experienced this feeling themselves, or at least experienced the impact of the statement. Based on participants' perceptions, this feeling arises when it reaches a certain level, leading to a decrease in safety awareness, known as complacent behavior. Complacency is the characteristic of feeling satisfied with a situation even though one is not aware of the potential dangers. (Neff, 2022). Unfounded self-satisfaction which is a characteristic of complacency which is often manifested through compliance drift and normalization of deviance (Burton, 2023). Complacency encompasses many aspects of human behavior, such as making incomplete decisions and rushing to improve response time (Burton, 2023; Neff, 2022).

This lack of safety awareness can increase the likelihood of deviations, which may escalate into incidents or accidents. (Kartal & Bayramoğlu, 2024; Machfudiyanto et al., 2020). However, key person at ICPA of Banyuwangi fully understand the potential for error and have made efforts to acknowledge their mistakes. This increases personnel safety awareness and, when combined with a just culture, can improve safety (Karanikas et al., 2020; Schopf et al., 2021).

A safety management system has at least four pillars: safety policy (commitment), safety risk assessment, safety promotion, and safety audit. (ICAO, 2018; Kešeľová et al., 2021). One mechanism for measuring implementation is through safety audits (Kim et al., 2019; Prasad Bastola, 2020). The consensus results indicated that respondents most disagreed with the statement that "Safety has been assessed and measured annually." This was further clarified in the discussion,

noting that ICPA of Banyuwangi does have a safety manual, but safety audits have not been implemented effectively. Respondents also noted the lack of human resources qualified to conduct safety audits or serve as safety investigators.

Meanwhile, on the most agree side, respondents (consensus) agreed that latent conditions will give rise to other hazardous conditions. (Xing et al., 2024). Based on participants' opinions, accidents are triggered by minor factors that constitute latent conditions. One of the latent conditions that has been identified is the incident of an aircraft engine cowling opening during flight. From the participant's perspective, this occurs due to a lack of pre-flight checklists, and even flight instructors do not participate in pre-flight preparation. Therefore, the chief of quality issued a new standard operating procedure (SOP), so that flight instructors are involved in the pre-flight process and become a safety learning in flight operations to students.

Accidents and incidents can occur despite strong defenses, this phenomenon is called "practical drift" (Snook, 1996; York et al., 2022). Practical drift occurs when safety awareness decreases due to the environment being equipped with adequate defenses, including regulations, technology, and trained human resources (Kim et al., 2019; York et al., 2022). One trigger is bad habits that become latent (Xing et al., 2024).

Everyone has the potential to make mistakes, so each individual must be equipped with sufficient knowledge of safety. From the participants' perspectives, differences exist depending on the professional context. While all aviation personnel at ICPA of Banyuwangi have adequate knowledge of safety, they must still be supported by a positive safety culture, including a culture of reporting and just culture.

Based on the consensus perception in Q-sort and also the results of focus group discussions, it can be said that ICPA of Banyuwangi safety is quite good because the key person who plays a vital role in flight operations has a good understanding of safety. The personnel understand and agree that latent conditions are dangerous; accidents and incidents will still occur, even with adequate safeguards in place. All flight personnel understand the basic concepts of safety. ICPA Banyuwangi personnel understand that every individual has the potential to make mistakes, and there is no complacent attitude among flight personnel.

ICPA of Banyuwangi needs to improve its safety culture and just culture. Safety culture and just culture can encourage personnel to adhere to safety procedures and maintain consistent safety awareness. Just culture will improve safety levels because all personnel are willing to report hazardous incidents, enabling hazards to be identified, risks to be assessed, and mitigated. At the same time, the reporter is protected rather than blamed.

## CONCLUSION

Flight safety is a crucial factor in flight operations, particularly during flight training. Safety must be measurable using various indicators, including the safety perceptions of the flight instructor and the student, particularly on the flight training process. The research results indicate that safety implementation at the Indonesian Civil Pilot Academy of Banyuwangi is quite adequate. Although serious incidents and accidents continue to occur, the responsible parties conduct evaluations, internal audits, and investigations to ensure aviation safety in accordance with CASR 141.

The consensus results, both most agreeing and most disagreeing, indicate that safety perceptions are based on two factors: self-awareness and the role of the organization, specifically leadership, in building and developing a safety culture, including a just culture. Complacency and practical drift are important considerations, particularly with respect to self-awareness. Complacency can lead to lapses in compliance, leading to practical drift and resulting in accidents, even if procedures are followed, technology is adequate, and personnel, especially competent personnel, are present. Personnel who feel complacent often ignore input and suggestions, especially safety-related criticism, and always assume they are right.

To promote a safety culture, including a just culture, the organization ensures that internal safety audits are conducted by competent, adequately trained personnel. It also develops safety values that can be incorporated into procedures and establishes safety performance indicators that will serve as safety targets and be evaluated annually. The development of a safety culture will be

more effective if regulators are involved in establishing safety culture indicators and in using them as assessment indicators through audits or surveillance.

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