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THE PURSUIT OF AVIATION SECURITY AND SAFETY: DALIL NAQLI AND DALIL AQLI

Afen Sena[1], Annisa Baby Callista[2], Fadhilla Nina Rizkyanti[3]
[1]Indonesia Aviation Academy Banyuwangi, Indonesia
[2]Airport Engineering Technology Study Program, Politeknik Penerbangan Palembang, Indonesia
[3]Airport Management Study Program, Politeknik Penerbangan Palembang, Indonesia
* Correspondence e-mail: afensena@mail.com

Abstract

Aviation security and safety are crucial aspects of the aviation industry that require serious attention from various parties. Along with technological developments and increasing air traffic, the challenges in maintaining aviation security and safety are increasingly complex. This research aims to examine the role of naqli and aqli postulates in improving aviation security and safety. The research methodology used a qualitative approach with a case study method, involving in-depth interviews with aviation experts, religious experts, and aviation regulators, as well as analysis of policy documents and official reports using data collection literature study and interview. The results showed that the principles of dalil naqli, such as justice and social responsibility, significantly shape aviation safety policies. Meanwhile, the dalil aqli approach, based on rationality and modern technology, effectively reduces accident risk and improves operational efficiency. This study concludes that integrating naqli and aqli arguments can create a more comprehensive aviation safety policy that various parties accept.

Keywords: *naqli, aqli, aviation safety, aviation security, safety policy*

Introduction

Aviation security and safety are crucial aspects of the aviation industry that require serious attention from various parties. Along with technological developments and increasing air traffic, the challenges in maintaining aviation security and safety are increasingly complex. In this context, the naqli and aqli approaches offer a holistic perspective in addressing security and safety issues. The proposition is the way to know something which cannot be known intuitively. Etymologically, a proposition is a guide that leads us to discover the law.

The proposition is evidence or argument used to support or prove a statement. In a religious context, especially in Islam, arguments refer to evidence or sources used to justify a law or regulation (Nugraha & Hasan, 2022). Naqli, according to language, means taking something from one place to another, namely those who write hadiths, copy them, and rely on their sources. Dalil naqli refers to evidence or arguments based on written texts, such as the Qur'an and hadith.

The naqli proposition refers to the revelations or sayings of the Prophet Muhammad SAQ, which are documented in religious texts (Nurwahidah et al., 2024a). Dalil naqli can be interpreted as a sign of evidence or clue from the text of the verses of the Quran, the evidence is the truth is absolute or essential (Supriadin, 2022). Dalil naqli refers to sacred texts in religion, and dalil aqli, which focuses on rationality and logic, can provide an ethical and philosophical foundation for the decision-making and implementation of aviation security policies.

The naqli evidence refers to religious teachings from sacred texts, such as the Qur'an and Hadith in Islam. This theory plays a vital role in providing a moral and ethical foundation in various aspects of life, including in the context of aviation security and safety. Principles such as justice, responsibility, and protection of life can be used as the basis for formulating policies (Alibe, 2022). The naqli refers to using healthy thinking without excessive lust (Fetraningtyas & Yunanto, 2021). Dalil aqli is based on reason and logic. In this context, dalil aqli refers to a rational and scientific approach to problem-solving. This theory encourages the use of science and technology to improve aviation security and safety, including risk analysis, crisis management, and data-driven decision-making.

Aviation security and safety theories cover many aspects, from risk management to safety policy to surveillance technology. Theories such as James Reason's Swiss Cheese Model and risk management theory from ISO 31000 can be applied to understand and improve safety standards in the aviation industry. Swiss Cheese Model causes systematic failures or work accidents that occur due to four layers, namely unsafe behavior (act), conditions that support the occurrence of unsafe behavior (a precondition for the unsafe act), poor supervision (unsafe supervision), and organizational influences (Tabu & Handayani, 2018). While ISO 31000 is a risk implementation guide consisting of three elements: principles, framework, and process (Mahardika et al., 2019). Implementation of theories that can be integrated into aqli and naqli are safety culture theory and also error/violation management (Hamat et al., 2021). Aqli and naqli also can be integrated to risk management process according theory and research by (Muhibban & Munir, 2024; Sprajcer et al., 2022).

Several studies have examined the role of naqli propositions in the context of business ethics and risk management. Research by (Indrawati et al., 2018) shows how Islamic principles can be applied in risk management to improve ethics and social responsibility in the aviation industry. Research on aqli arguments focuses more on rational approaches to decision-making. The study by (Wira et al., 2023) this research highlights how data-driven risk analysis and technology can improve aviation safety. It shows the importance of integrating rational thinking and technological practices in addressing aviation safety challenges. Principles from naqli texts, such as justice and responsibility, can be integrated into aviation safety policies (Poerwanto, 2019). For example, aviation law enforcement policies that protect life and justice can be based on religious teachings. Combining naqli and aqli arguments can result in a more comprehensive approach to improving aviation

security and safety. For example, safety policies based on ethical values (naqli) and supported by scientific analysis (aqli) can improve public trust and operational effectiveness.

This research analyzes the role and synergy between naqli arguments (religious texts, such as the Qur'an and hadith) and aqli arguments (rationality and logic) in supporting aviation security and safety. The research explores how religious values and rational approaches can complement each other in shaping more comprehensive aviation policies and practices regarding ethics, regulation, and technology. Through case studies, this research also seeks to identify real-world applications of integrating the two approaches and provide recommendations to improve aviation safety holistically. Given the high risks in the aviation industry, integrating religious principles and scientific approaches can provide a more holistic foundation for creating a sustainable, human system oriented towards moral responsibility. This research is essential to fill the gap in studies linking religious and logical dimensions in the context of aviation and make a practical contribution to forming more ethical and effective policies. The urgency of this research lies in the need to address global challenges in aviation security and safety with an approach based not only on technical dalil aqli but also on ethical and spiritual values derived from dalil naqli.

Methods

This research uses a qualitative approach (Creswell & Báez, 2021; Mohajan & Mohajan, 2022) to explore the interplay between dalil naqli (scriptural evidence) and dalil aqli (rational evidence) in enhancing aviation security and safety. Primary data is collected through in-depth interviews with aviation experts, religious scholars, and safety practitioners to gain insights into the integration of ethical, religious, and rational frameworks. Secondary data, including academic journals, regulatory documents, and case studies, is analyzed to provide contextual understanding and support the findings (Jain, 2021). The study aims to bridge theoretical perspectives with practical applications, emphasizing a holistic approach to ensuring aviation safety and security.

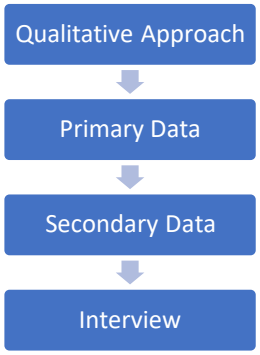

Figure 1. Research Context

This research explores and analyzes the role of naqli and aqli propositional interventions in aviation security and safety. This research adopts qualitative research to understand complex and dynamic phenomena related to the intervention of naqli and aqli propositions in aviation security. The qualitative approach allows researchers to gain in-depth insights through rich and contextualized data collection. This research is descriptive and tends to use analysis. Process and meaning are more displayed. The theoretical foundation is used as a guide so that the research focuses on the facts in the field (Mappasere & Suyuti, 2019).

This study also conducted interviews involving several informants who were selected based on specific criteria. The informants included aviation experts and aviation regulators. The interviews aimed to gather their views and experiences related to naqli and aqli arguments in aviation security. In-depth interviews aim not only to extract data but also to reveal the meaning of the research setting. In conducting participatory observations, researchers play an active role in activities in the field so that researchers can easily observe because they blend in with those studied (Döringer, 2021; Ichsan & Ali, 2020).

Document analysis was collected from official documents, reports, and academic literature relating to aviation security policies and the principles of the dalil naqli and aqli. This documentation is used to complement and confirm findings from interviews. In this study, the documentation method aims to obtain valid data from written documents, archives, reports, or records relevant to the research topic and use

documents as a data source to verify or strengthen the results obtained from other methods, such as observation or interviews. This helps to increase the validity of the research.

Results And Discussions

This research strengthens previous findings showing that integrating ethical and rational principles in aviation safety policies can increase effectiveness and public trust. These findings also add new insights by showing how the two approaches can be integrated synergistically to achieve better results (Nur & Wulandari, 2022). Data analysis in research implementation of aviation safety with dalil aqli and dalil naqli. In research that aims to analyze the implementation of aviation safety from two main perspectives, namely dalil aqli (rational/logic) and dalil naqli (religious texts), data analysis is an essential part of digging deeper into the relationship between safety policy, rational principles, and religion. Here is how to develop and organize data analysis for this research: Data Analysis Based on aqli's Proposition (Rational/Logical). The aqli proposition refers to using logic and rational reasoning to understand and explain phenomena, including aviation safety. In this context, data analysis will be carried out using scientific approaches, statistical analysis, and managerial theories related to aviation safety. Statistical Approaches to Pattern Identification is the data analysis method used in this aqli approach, which will focus on quantitative data to look for patterns and causes of aviation accidents or incidents.

These data usually involve Aviation Accident Data, compiled data from accident reports collected from various sources, for example National Transportation Safety Commitee (NTSC), National Transportation Safety Board (NTSB), and airline reports. This data will include the type of accident, time of occurrence, location, main cause, and losses incurred (X. Zhang et al., 2021). Technical and operational factors, such as: analyze technical defects, aircraft systems, mechanical errors, or problems in flight management. For example, is there a tendency for accidents to be caused by navigation system errors or failures in aircraft components such as engines or instruments?

Data analysis based on naqli's proposition (religious texts): The naqli proposition refers to the instructions in religious texts (Al-Qur'an, hadith, or other religious teachings). In this research, this approach will be used to assess the moral and ethical values contained in religious teachings related to aviation safety. The following is the development of analysis based on naqli's postulates: Study of the text of the Quran and hadith, perspective on fiqh and religious ethics, and the relationship between religious principles and safety policy.

This research shows a connection between the naqli argument and the aqli argument in maintaining security and safety (Ramli & Abdullah, 2023). The Qur'an and hadith teach the importance of avoiding danger and safeguarding lives, which is particularly relevant in aviation. For example, Surah Al-Baqarah Ayat 195 and Surah An-Nisa' Ayat 29 emphasize the prohibition against actions that endanger oneself or others, with commentaries from scholars such as Ibnu Katsir and Al-Jalalayn reinforcing this meaning. In the context of aviation, this verse can be translated as an imperative for all parties to ensure flight safety through the use of appropriate technology and procedures, as well as through ongoing maintenance.

Integrating the concepts of dalil aqli and dalil naqli into the Aviation Safety Management System (SMS) can actually be done with a philosophical and practical approach, especially in the aspects of ethics, decision-making, and human resource management. *Integrating Safety Policy*, Islamic principles emphasize the importance of trust and responsibility in work, as in the word of Allah as stated in QS. An-Nisa: 58. This can be applied to safety policies by emphasizing the moral responsibility to all parties to maintain aviation safety as a great trust (naqli principles). While reason is used to develop safety policies that are rational and data-driven. For example, statistical-based risk analysis or the use of predictive technology to support safety policies (aqli principles). Developing SMS policies that not only comply with

international regulations (ICAO), but also incorporate moral and ethical aspects, such as collective responsibility and respect for human life. *Integrating to Safety Risk Management* (SRM), Islam teaches to avoid harm (madharat) and minimize risk, as per the Prophet's hadith "It is not permissible to cause harm to oneself or others" (HR Ibn Majah). In risk management, this means any potential harm must be identified and addressed to protect human life (naqli principles). While intellect helps in creating risk analysis models such as Bowtie or Failure Mode and Effects Analysis (FMEA). It supports hazard identification and risk mitigation in a systematic way (aqli principles) as stated by (Kucuk Yilmaz, 2020; Sprajcer et al., 2022; W. Zhang et al., 2022). Using this principle to apply risk management tools while ensuring that risk mitigation also meets ethical values, such as fairness and transparency.

Integrating Safety Assurance (SA), the concept of continuous monitoring and evaluation is in line with the Islamic principle of muhasabah (introspection and self-evaluation) as state in QS. Al-Ahzab: 52. This reflects the importance of continuous safety monitoring as a form of supervision (naqli principles). For example, using technology such as predictive maintenance and big data analytics to ensure the effectiveness of safety systems. Reason plays a role in creating innovations to make monitoring easier (aqli principles). The concrete example is engaging internal and external audits with the moral approach that every employee is part of the collective responsibility for safety. *Integrating Safety Promotion* (SP), in Islam, spreading knowledge and raising awareness is part of da'wah. A Prophetic Hadith states "Convey from me even one verse." (HR. Bukhari). This principle can be applied in safety training to raise awareness of collective responsibility (naqli principles). Reason is used to develop effective training materials based on adult learning studies (andragogy). The concrete example creating a safety training program based on moral values, such as honesty in reporting hazards and the importance of maintaining integrity in aircraft operations.

Integration to Error and Violation Management. Islamic principles emphasize repentance and correction of mistakes "Every son of Adam is a sinner, and the best of sinners are those who repent" (HR Tirmidzi).

In the context of human factors, this encourages a non-punitive culture towards human errors, while remaining strict on intentional violations (naqli principles). In other way, reason is used to systemically analyze the causes of errors, such as through the SHELL model method, and create logic-based solutions to prevent repetition (aqli principles). By implementing a Just Culture program that encourages honest reporting of errors, with a learning rather than punishment approach, while still punishing intentional violations based on ethical principles.

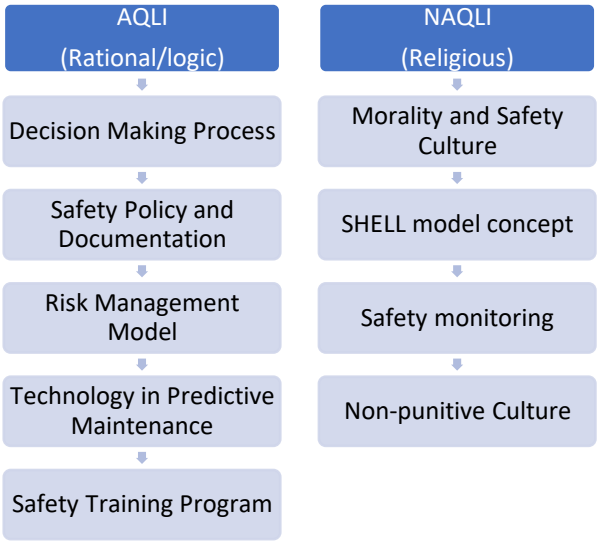

Figure 1. Integration of Aqli & Naqli

Data from the International Air Transport Association (IATA) confirms that implementing an effective Safety Management System (SMS) significantly reduces the number of aviation incidents and accidents (Blišťanová & Tirpáková, 2021). Statistics show that systematic safety measures help identify potential risks and enable preventive action before an accident occurs (Rat, 2019). This emphasizes that passenger safety is a significant concern for the aviation industry, as related research shows.

The economic impact of aviation accidents: Aviation accidents affect passenger safety and cause significant economic losses. Boeing research shows that a major accident can cause billions of dollars in economic losses, including aircraft damage, victim compensation, and stock declines. In addition, public confidence in the aviation industry may

decline, ultimately affecting passenger numbers and airline revenues.

Compliance with international safety regulations, including those issued by the ICAO and national bodies such as the FAA, plays a vital role in reducing aviation incidents. ICAO safety audits through the Universal Security Audit Programme (USAP) and Universal Safety Oversight Audit Programme (USOAP) have been proven to help member states improve their compliance with safety standards. With high compliance, aviation incidents can be significantly minimized.

From our research result, combining naqli and aqli evidence, we see that maintaining aviation safety and security is necessary, supported by religious teachings and logical and scientific arguments (Nurwahidah et al., 2024b). The Qur'an and hadith emphasize the importance of avoiding harm and protecting lives that align with safety management system standards in hazard identification and risk management processes. It is also in line with safety culture standards in aviation, which have culture and reporting culture as a basis for safety assurance. Just culture, as referred to above, is a condition of trust when people are encouraged to convey safety-related information and clearly understand behavioral limitations (Amalia, 2019; Faturachman et al., 2023), what is acceptable and what is unacceptable. These principles align with scientific analysis showing that proper safety measures can prevent accidents and protect human lives (Majid et al., 2022; Stroeve et al., 2022; Wilky et al., 2019). Thus, this combination of naqli and aqli arguments reinforces the message that maintaining aviation safety and security is an obligation that must be carried out by all relevant parties, by religious teachings and existing logical and scientific principles.

Conclusion

The naqli proofs provide the moral and ethical foundation for safety and security in aviation, while the aqli proofs provide the rational and scientific methods for effective implementation. Both complement each other to create a safety system that meets technical standards and reflects human values and justice. The intervention of naqli and aqli arguments plays a significant role in improving aviation security and safety. Dalil naqli provides a solid moral foundation through the principles of justice, social responsibility, and protection of life, which serve as ethical guidelines in safety policy. Meanwhile, aqli arguments have proven effective in reducing risks and improving operational efficiency with their rational approach and utilization of advanced technology. The integration of these two approaches results in safety policies, decision making, risk management, and error/violation management that are more comprehensive and acceptable to various parties, thereby strengthening safety standards and increasing public confidence in the aviation industry.

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