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The Need for Establishing a Commercial Aviation Safety Council to Prevent Aircraft Accidents

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ABSTRACT

The government has significantly strengthened safety measures since the 2013 San Francisco plane crash, and there have been no fatalities until 2023. However, the worst domestic aircraft accident occurred in December 2024, requiring continuous and innovative measures. In order to prevent additional fatal aviation accidents, safety management must be operated before an accident occurs, not after, through cooperation with airlines and data-based preventive safety management. The United States established the CAST(Commercial Aviation Safety Team) in 1997 after the 1996 TWA(Trans World Airlines) accident, which led to a significant decline in aviation safety. Canada also established C-CAST and has played a global role in flight data analysis since the mid 1980s by working with airlines. Looking at the innovation cases of other states, establishing a permanent commercial aviation safety council that communicates with airlines and experts and utilizes data to manage aviation safety before an accident occurs is a golden opportunity for innovation.

Key Words : CAST(Commercial Aviation Safety Team, 상업항공안전협의체), SSP(State Safety Program, 국가안전프로그램), SMS(Safety Management System, 안전관리시스템), Aviation Accident Prevention(항공사고예방)

Ⅰ. Introduction

The Guam accident occurred in 1997, and the Ministry of Construction and Transportation established and improved comprehensive aviation safety measures to bring it up to the level of advanced countries. In 2001, the FAA(Federal Aviation Administration) announced the result of IASA (International Aviation Safety Audit) Category 2 for not meeting international standards, then major improvements were made. As a result, no fatal accidents occurred for 11 years from 2000 to 2010. Due to these safety efforts, in 2008, the USOAP(Universal Safety Oversight Audit Programme) safety audit of ICAO(International Civil Aviation Organization) showed the world's best performance among 191 member states(MOLIT, 2013).

However, another fatal accident occurred in San Francisco in 2013, and a large-scale aviation safety improvement was made. Since the 2013 accident, there has been no fatal airline accident until 2023, with these dedicated safety improvement efforts of the MOLIT(Ministry of Land, Infrastructure and Transport). It was a

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safe country recognized as having the most advanced aviation safety management in the world. It secured competitiveness and was ranked 7th in the world in terms of international passenger transport standards. Despite this safety record, the worst domestic disaster occurred in Muan on December 29, 2024(Park, 2025).

After major accidents, aviation authorities have been promoting safety through large-scale improvements. In order to respond to the current aviation disaster in a complex and changing environment and to prevent accidents preemptively and effectively, it is necessary to seek a new method rather than the existing safety management method. Overseas, they are already maintaining a high level of safety by combining data through collaboration with airlines and forming a cooperative body including experts to perform preventive and predictive safety management.

In this study, we propose a plan to operate a permanent commercial aviation safety council that communicates with airlines and subject matter experts and utilizes data to manage aviation safety before accidents occur for proactive safety management, thereby improving the stability of aviation safety management.

Ⅱ. Discussion

2.1 ICAO's Standards on Safety Management

According to Article 12 of the International Civil Aviation Convention, each state shall implement and enforce SARPs(International standards and recommendations) through national aviation laws and regulations. The states shall regulate and supervise their aviation safety activities following international standards. States shall establish and maintain an SSP(State Safety Program) that is commensurate with the size and complexity of the State's civil aviation system. States shall establish and maintain a process to identify hazards from collected safety data. 3.5.1 States should promote safety awareness and the sharing and exchange of safety information to support, within the State aviation organizations, the development of a positive safety culture that fosters an effective SSP. States shall establish SDCPS(safety data collection and processing systems) to capture, store, aggregate, and enable the analysis of safety data and safety information. States shall promote the establishment of safety information sharing or exchange networks among users of the aviation system, and facilitate the sharing and exchange of safety information, unless national law provides otherwise(ICAO, 2016).

The operation of a program such as the US CAST(United States Commercial Aviation Safety Team) as a representative safety promotion activity, utilizing the results of aviation safety data analysis, may play an important role in reducing fatal accident rates.

2.2 The Introduction of CAST

2.2.1 Initiation of CAST Program

The United States had many aviation accidents in the 1990s, and in 1996, the TWA (Trans World Airlines) accident occurred, which led to the establishment of the White House Commission on Aviation Safety and Security, which requested an 80% improvement in accidents within 10 years. To this end, the NCARC (National Civil Aviation Review Commission) recommended cooperation between the FAA and the aviation industry through its report (CAST, 2025).

2.2.2 US CAST Program

2.2.2.1 The Establishments of CAST

Accordingly, the USCAST(Commercial Aviation Safety Team in the United States) was established and operated in 1997 as an organization for preventing aviation accidents, and a consultative body between the FAA, an aviation safety organization, and private industry was established to establish and implement a national aviation safety promotion plan to promote safety activities between the government and the aviation industry. CAST determines areas requiring safety enhancement due to high risk of human accidents based on precursors and contributing factors identified through analysis and research, and shares this with the industry to support risk management through the concentration of resources. To determine the progress of achieving safety goals, performance measurement methods and schedules were established, and the transport aircraft accident rate was successfully reduced by 83% from 1998 to 2008(CAST, 2025).

2.2.2.2 The Process of CAST

CAST uses a disciplined, data driven, focused approach to analyze safety data and information, identify hazards and contributing factors, develop safety enhancements to address risk, implement safety enhancements, track implementation and continously monitor the effectiveness of the enhancements and use knowledge gained to continueally improve the aviation system with proactive approach that prioritizes safety to detect and mitigate risks by enhancing safety before an accident occurs as shown in Fig. 1. Through safety data-based strategies and analysis, US CAST is working together with CASTs in other countries to achieve the goal of reducing commercial fatality risk by 50% from 2010 to 2025(FAA, 2016).

2.2.2.3 The Membership of USCAST

CAST is composed of government such as

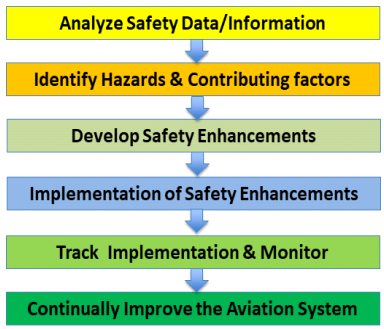

Fig. 1. The process of CAST

FAA, National Aeronautics and Space Administration, Transport Canada Civil Aviation and US Department of Defense, employee group as Airline Pilots Association, and National Air Traffic Controllers Association and industry group such as Aerospace Industies Association, Airbus, Airports Council International, Airlines of America, The Boeing Company, Flight Safety Foundation, Gernal Electric, National Air Carrier Association and Regional Airline Association as shown in Fig. 2(FAA, 2016).

2.2.3 C-CAST Program

Canada also established and operates C-CAST (Canadian Cast) and collaborates with the US CAST. Canada has played a global role in flight data analysis by cooperating with airlines since the mid-1980s. NRC IRAP(National Research Council of Canada's Industry Research & Assistance Program) formed CASES(Collaborative Aviation Safety Exchange System) as a result of

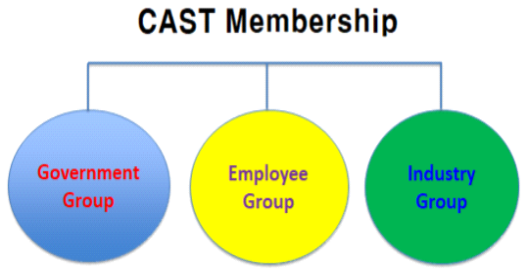

Fig. 2. CAST membership

the R&D (Research and development) Project and formed C-CAST(APS Aerospace Corp, 2025).

2.2.4 Europe CAST Program

Europe established ECAST(European CAST) as a safety activity team for transport aircraft accident prevention under the ESSI(European Strategic Safety Initiative) and implemented a 10-year program to improve aviation safety in Europe from 2006 to 2016. ECAST is an organization similar to CAST in the United States. It was established with the purpose of reducing transport aircraft accident rates and fatalities through voluntary efforts by the aviation industry and improving the safety of transport aircraft through cooperation between each European authority and the aviation industry. It operates independently from national organizations. ECAST has prioritized policies and R&D(research and development) for securing safety in ground safety, runway safety, SMS(safety management system), and safety culture, which account for the largest proportion of accident types in Europe. ECAST's functions and resources have been transferred to a team participating in the SRM(European Safety Risk Management) system and are being operated(Skybrary, 2025).

2.3 The Risk Area of the CAST Initiative with Partnership

The CAST collaborates with regulators, manufacturers, operators, professional associations, research groups, and international organizations to build aviation safety partnerships that enhance aviation safety, focusing on scheduled airliner operations(Wikipedia, 2025).

CAST identifies precursors and contributing factors to address the most prevalent categories of risk. The group has reduced the risk in the following areas of runway excursions, controlled flight into terrain, approach and landing accidents, loss of control, runway incursions, weather, turbulence, icing, cargo related accidents, maintenance, midair collisions, and uncontained engine failures as Table 1(FAA, 2016).

2.4 The International Collaboration of the CAST Program

Aviation operates internationally. CAST collaborates with ICAO, FSF(Flight Safety Foundation), IATA(International Air Transport Association), EASA(European Union Aviation Safety Agency), TCCA(Transport Canada Civil Aviation), and other organizations. CAST has established links with other safety initiatives such as E-CAST, RASG-PA(Regional Aviation Safety Group Pan American), COSCAP(coordinated development of operational safety and continuing airworthiness program) initiatives, and other regional safety programs. Many organizations have adopted and implemented CAST safety enhancements appropriate to their region(FAA, 2011).

Ⅲ. Conclusion

CAST was established in 1997 to form an

Table 1. CAST's risk areas

Category	Risk area
Runway	• Runway excursions • Runway incursions
Environ-ment	• Weather • Turbulence • Icing
Mainten-ance	• Maintenance • Uncontained engine failures
Airborne	• Approach and landing accidents • Controlled flight into terrain • Loss of control • Cargo related accidents • Midair collisions

Industry-Government partnership with voluntary commitments, consensus decision-making, data-driven risk management, and implementation focused on reducing the commercial aviation fatal accident rate(CAST, 2025).

The recent tragic accidents that claimed numerous lives have called for innovative improvements. Each contracting state is responsible for managing its aviation safety to ensure safe global air navigation.

Based on the analysis, this study proposes the following improvements.

First, aviation authorities should establish an aviation safety council like the CAST in the United States through cooperation between the public, private, industrial, and academic sectors, and implement reductions with the goal of reducing the accident rate by 80% within 10 years.

In Annex 19, ICAO stipulates that each contracting state should promote the establishment of a safety information sharing or exchange network among users of the aviation system so that they can regulate and supervise aviation safety, and that the sharing and exchange of safety information is necessary(ICAO, 2016).

Second, organizations and procedures should be reorganized to proactively detect and mitigate risks using data like CAST.

ICAO recommends that states should establish and maintain procedures to identify risk factors from safety data collected in Annex 19 (ICAO, 2016).

Third, aviation authorities should exchange aviation safety data analysis, key results, and safety improvement strategies through the CAST type with other contracting countries, and share safety analysis results from other contracting countries with the domestic aviation industry to enhance aviation safety.

Fourth, policies and research and development are required to improve a positive safety culture by utilizing the Korean CAST.

The aviation authority and airline industry should work together to improve aviation safety by establishing a permanent aviation safety council, such as CAST, which is the aviation accident prevention organization in the United States, with the participation of industry, academia, and research institutes, before another aviation accident occurs.

In order to prevent aviation accidents such as the Dec 29 passenger plane disaster from happening again, the public, private, military, industry, academia, and research institutes should collaborate to analyze safety data, identify risk factors, and innovate aviation safety by implementing efficient and systematic aviation safety management. This should proactively propose and operate policies to make our skies the safest in the world.

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