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A Study on the Aviation Safety Information System in Korea

- With the Comparative Analysis of the ICAO, the United States and EU system -

한국의 항공안전 데이터베이스 분류체계에 관한 연구

Lee Kang-Seok(이강석)*

Contents

* Associate Professor, Dept. of Air transportation and Administration in Hanseo University

I. Introduction

After World War II, international aviation accident rates decreased due to the development of aviation technology and equipment, and continual efforts to prevent the occurrence of accidents. Beginning in the 1980s, however, no significant decrease in congestion is shown.[1)]

Despite the development of aviation technology and equipment, the improvement of navigation equipment technology, and the establishment of regulations and their enforcement, aviation safety still cannot be guaranteed. Therefore, we must concern ourselves with finding new methods for preventing aviation accidents.[2)]

We considered that the international community recognizes initial risk factors before they cause personal or property damages, and that they have a new method to develop appropriate countermeasures by collecting, analyzing, and sharing safety information. This method addresses our concerns about finding new ways of preventing accidents.[3)] In other words, we want to emulate this aviation safety information system for gathering, analyzing, and sharing information; the classification system of aviation safety data needs to be standardized.

Recently, the International Civil Aviation Organization (ICAO) has aimed to select Annex 13 for each state's Aviation Safety Programme (SSP) in the field of accident investigation. Therefore, the Republic of Korea's Aviation and Railway Accident Investigation Board should adopt Annex 13 with

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1) Kim, Yeon Myeong., Kang, Hyeon Cheol., Shin, Hong Cheol., A study on the Implementation of Global Aviation Information Network(GAIN), The Korea Transport Institute, 2001, summary p.1.

2) Shin, Auk Sik., Kim, Il Young., A Study on the Improvement of Aviation Safety Information Management System, Aviation Development No. 49, 2009, p.146.

3) Choi, Hue Young., Colletion and Analysis Aviation Safety Information through Risk Management, Aviation, Aviation Development No. 39, 2005, p.183.

amendments by November 2010, and all member countries should build accident and incident reporting databases for analyzing and determining the necessary action to effectively prevent accidents. In addition, as part of the strategy for proactive accident prevention, we have to adopt accident investigation procedures and systematic approaches according to ICAO regulations and processes. These regulations recommend regulatory standards, accident investigation techniques, and scientific tools. Also, the Republic of Korea's Aviation and Railway Accident Investigation Board should apply them and establish a standardized format for reporting domestic aviation accidents and incidents.[4)]

In this study, we compare and analyze the taxonomies of international aviation accidents through a present survey of the aviation accident classification systems in ICAO, the United States, and Europe. Furthermore, we suggest new methods for adapting a classification system and research for constructing an aviation safety information system to gather, analyze, and share data all over the world in the future.

Ⅱ. Current situation of ICAO and foreign countries's aviation accident taxonomy

1. International Civil Aviation Organization(ICAO)

ICAO adopted a declaration (A33-16) to accelerate the collection and sharing of aviation safety information and has tried to amend related international

4) ICAO Annex 13, Chapter 3 General and Chapter 8 Accident Prevention Measures

regulations. The act recommends that nations participate in activities that accelerate the exchange of aviation safety information, revise their safety database systems, and develop networks for the sharing of information and analysis of comprehensive data. Also, ICAO is trying to comfortably exchange information about safety, including data reported to their Accident/Incident Data Reporting (ADREP) system and their aviation safety information system, among users of aviation systems.[5] The ADREP system plays a role in providing nations with accident prevention information based on broad international experience as a databank of worldwide accident/incident information.

In 1979, the Accident Investigation and Prevention (AIG) Section of ICAO made the Accident/Incident Reporting Manual (ADREP), offered recommendations about the ADREP system, and set up an ADREP research group to aid the office in performing recommendations. ADREP data codes have been used as the standard codes to deal with accident/incident data, and each nation is developing an accident investigation database based on these standard codes. Doc 9156 in the ADREP manual contains detailed information for safety systems, such as reporting patterns, general guidelines, and codes for accident causes.

ICAO's ADREP system comprises 27 topics, 102 sections, and 589 attributes and has data classifications like the documentation "ADREP 2000 Taxonomy." The 27 topics include: Aerodrome, Air Traffic Service, Aircraft, Events, and Failures. Each topic is divided into sections, and each section is divided into attributes. An example of a topic, its sections, and their attributes in the ADREP 2000 Taxonomy is shown in Table 1.

5) Shin, Hong Cheol., A Study on the Facilitation of Safety Information Sharing in Aviation, Korea Aerospace University graduate school, Master thesis, July 2009, p. 46.

<Table 1> Aerodrome Classification System in ADREP 2000 Taxonomy

Topic	Section	Attribute
Aerodrome	Aerodrome Identification	Id : 4 Aerodrome elevation above MSL.
		Id : 1 Aerodrome latitude.
		Id : 5 Aerodrome location indicator.
		Id : 2 Aerodrome longitude.
		Id : 7 Aerodrome status.
		Id : 10 Aerodrome type.
	Helicopter landing area	Id : 3 Helicopter landing area configuration.
		Id : 8 Helicopter landing area surface type.
		Id : 9 Helicopter landing area type.

(source : www.icao.int)

2. The United States

(1) Aviation Safety Information and Analysis Sharing (ASIAS)

Aviation Safety Information and Analysis Sharing (ASIAS), formerly called the National Aviation Safety Data Analysis Center (NASDAC), is managed by the Office of Aviation Safety Analytical Services (ASA), which is part of the Office of Aviation Safety (AVS) under the Federal Aviation Administration (FAA). ASIAS is the standard database for aviation safety. This system is composed of diverse and extensive data on aviation accidents and incidents. Also, its main storage contains the reporting system material of respected institutions, such as the FAA's Office of Accident Investigation (AAI), the National Transportation Safety Board (NTSB), and NASA's Aviation Safety Reporting System (ASRS), as well as data on aviation safety.[6)]

For sharing and consolidating international information, ASIAS uses the CAST/ICAO Common Taxonomy Team (CICTT), which is made up of the Commercial Aviation Safety Team (CAST) and ICAO. The CICTT takes charge of defining accidents and classifying aviation accidents and incidents. Furthermore, they established taxonomies about aircraft model makers, engine types, phases of flight, occurrence categories, and engine occurrence subcategories. In addition, taxonomies about concept banks, positive taxonomies, and aerodromes are currently being researched for definition. The five taxonomies and detailed classifications established by the CICTT are defined in English, Spanish, and French.[7]

<Table 2> Taxonomy of CICTT

Taxonomy	Detailed classification
Aicraft make/model	21개
Engine make/model	12개
Phases of flight	13개
Occurrence categories	24개
Engine Occurrence Sub-Category	24개

(source : www.intlaviationstandards.org)

(2) NTSB's Aviation Accident Reporting System

Although the NTSB, which is considered the formal, primary source for aviation accident data, was originally created for administrative purposes, it has the capacity for analysis. The NTSB not only issues special annual summaries which contain the statistics for aviation accidents, but also is

6) Ministry of Land, Transport and Maritime affairs, A Study on construction of the integrated Aviation Safety Information System(step 2), Vol 1, 2009, p. 127.

7) http://www.intlaviationstandards.org, 21 June 2010.

responsible for investigating all aviation accidents and incidents. Furthermore, the NTSB offers guidance regarding probable risks for aeronautical navigation accidents and makes recommendations to the FAA.[8)]
In the NTSB, the 6120.1 is a form used for reporting aviation accidents and incidents. This system data is categorized according to aircraft, brief report, engine, event, flight, crew, flight time, injuries, occurrence, and sequence of events, which are defined as detailed data individually.[9)]

(3) FAA Accident and Incident Data System (AIDS)

In the United States, the NTSB is responsible for all civil aviation accidents. Both the FAA and NTSB collect data, but the FAA’s Accident Incident Data System (AIDS) handles additional incident data that goes unreported by the NTSB. In the case of a bird striking an aircraft during takeoff, the case is entered into the FAA’s data system because the bird strike may not do serious damage to the aircraft. AIDS records the location, aircraft, and information reported by the aircraft operator.[10)]

(4) Aviation Safety Reporting System (ASRS)

NASA supports aviation research and manages the Aviation Safety Reporting System (ASRS). The ASRS guarantees anonymity to all reporters in order to encourage pilots and air traffic controllers to submit reports about faults and malfunctions during operation. The ASRS’s data taxonomy has three hierarchical structures, which include main, medium, and small classifications. The main classification is divided into time, place, environment, aircraft, component, person, events, and assessment.[11)] A part of the detailed classification of environment is shown in Figure 1.

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8) http://www.airportal.co.kr, 22 June 2010.
9) http://www.asias.faa.gov, 23 June 2010.
10) http://www.airportal.co.kr, 22 June 2010.
11) http://asrs.arc.nasa.gov, 22 June 2010.

<Figure 1> The Example of ASRS's Taxonomy

ENVIRONMENT		
Flight Conditions		Q1
	50 - VMC 51 - IMC 52 - Mixed 53 - Marginal	
Weather Elements / Visibility		
	5001 – Cloudy 56 – Fog 5002 - Hail 5003– Haze / Smoke 57 - Icing 58 - Rain 59 - Snow 60 - Thunderstorm 61 - Turbulence 62 - Windshear 5004 - Other________________ 83 - Visibility (SM)	

(source : www.nasa.gov)

3. Europe

The European Commission (EC) encouraged most of the aeronautical authorities in the European Union (EU) to collect information about aviation accidents and incidents, which they did, but in different ways. Due to differences in the data types used by various information systems, the mutual search and exchange of data were impossible.[12)]

As a solution to this problem, the European Co-ordination Centre for Aviation Incident Reporting Systems (ECCAIRS) was started and made available to the information systems in all EU countries. The EU selected

12) Choi, Hue Young., Colletion and Analysis Aviation Safety Information through Risk Management, Aviation, Aviation Development No. 39, 2005, p.187.

an order to regulate the reporting of civil aviation accidents. Members followed an order (Directive 2003/42/EC)[13] which is related to Europe. Furthermore, they accepted a regulated agenda to their aviation law within two years of joining the EC. Since July 2005, each country has had to collect and share national accident information. The EC and the analysts of each country have access to a lot of information, which is associated with the prevention of accidents.

The purpose of ECCAIRS is to prevent aviation accidents and incidents with liability or obligation. Aviation accidents may occur anywhere at any time, but any accident that happens can probably be compared to some similar accident in the past. If we can recognize these similarities through the analysis of accidents and incidents, future accidents can be prevented.

The ECCAIRS system consists of data input, search, analysis, utilization, system tools, data integration, data supply, and the ECCAIRS license. ECCAIRS continues to have ICAO conferences and workshops for the purpose of improving the system.[14]

ICAO collected aviation accident and serious incident data through the ADREP system for 30 years. However, since 2004, ICAO has used ECCAIRS instead of ADREP, so ECCAIRS is being introduced and used in the Republic of Korea. ECCAIRS is becoming the standard for the European Aviation Safety Agency (EASA) data reporting and exchange in Europe, as well as all over the world. It has gained support since Switzerland, Brazil, the Republic of Korea, and many other countries began supporting and storing data using this system.

The data that was set by the ICAO convention is implemented in ECCAIRS. Also, this data was developed on the basis of ADREP 2000 Taxonomy. This

13) Directive 2003/42/EC - Directive of the European Parliament and of the Council on Occurrence Reporting in Civil Aviation.

14) http://eccairsportal.jrc.ec.europa.eu, 12 December 2009.

data is used in ECCAIRS as summarized in Table 3.

<Table 3> ECCAIRS Taxonomy

ECCAIRS Taxonomy
• Aircrafts ATM by designator • Aircrafts ATM by Manufacturer • Aircrafts make/model • Air Navigation Services • ATM Rating and endorsement types • Aviation operations • Descriptive factors • Engines • Events • Event phases • Explanatory factors • Fuels • Pilot license types • Locations by Indicator • Locations by State • Modifiers • Occurrence classifications • Operators • Organisations and persons • Propellers • Recommendations • Reporting forms • States • Attribute values by attribute • Topics, Sections and Attributes • Attrribute values by section • Entities and attributes

(source : www.icao.int)

Ⅲ. Comparison and analysis of the foreign countries's aviation accident taxonomy

We compare taxonomies among ICAO, the United States, and Europe through research of international aviation accidents as shown in Table 4.

<Table 4> Comparing Taxonomy among ICAO, U.S, and Europe

	ICAO	U.S	Europe
System	ADREP	ASIAS (The most common system)	ECCAIRS
Taxonomy	ADREP 2000 Taxonomy	CICTT common Taxonomies	ECCAIRS Taxonomy (Based on ADREP 2000.)
System structure	▪ 3 hierarchical structures classify 27 Topics, 102 Sections, and 589 Attributes.	▪ 5 classification system - Aircraft make/ model - Engine make/model - Phases of flight - Occurrence categories - Engine Occurrence Sub-Category	▪ Establish based on ADREP 2000. ▪ Defined each data. ▪ It is complicated and massive material because each upper class of the data has different hierarchical structure.
Collecting Data	▪ Data source is from ICAO report .	▪ To hold diverse material such as NTSB reporting system, AIDS, and ASRS.	▪ Using ECCAIRS countries around the world including EU

	ICAO	U.S	Europe
Remarks	▪ Collected data for 30 years since 1974, but selecting ECCAIR instead of ADREP from 2004	▪ The purpose of ASIAS is to collect, analyze, and share about all related information. However, it is not reporting system	▪ Since 2004, the ICAO has adopted the ECCAIRS instead of the ADREP. ▪ ECCAIRS becomes standard ▪ Republic of Korea adapts and uses ECCAIRS

As a result of comparison and analysis, we realized that ECCAIRS, used in Europe, is divided with complex and detailed data, which led it to become the standard for data taxonomy. Furthermore, ECCAIRS provides accurate data to prevent and discover risks through the gathering and analysis of aviation safety information. In the United States, each agency has a system devoted to aviation safety, and they have a substantial interest in aviation safety and do a variety of safety-related activities. Thus, a system that integrates a variety of aviation safety information can get well-developed information through a system such as ASIAS, not only to support a wide range of activities related to aviation safety, but also to investigate aviation accidents. In addition, the CICTT taxonomy that is used in ASIAS can be used on a smaller scale than other taxonomies, and it continues to develop taxonomies and clear up definitions of data, examples, and manuals. Since it provides data in a variety of languages, all countries can easily access and use it.

Ⅳ. Comparison and analysis of taxonomies related to human factors

1. Human Factors Analysis Classification System (HFACS)

James Reason's Swiss cheese model is directly related to the human factors involved in accidents. It identifies the "latent" or intangible failures (so-called cheese holes) and "active failures" that ultimately lead to an accident . However, this situation makes the accident investigators intent on only considering potential mistakes existing in cause and effect. The U.S. Air Force and Army are aware of these limitations and developed a taxonomy for analyzing civil aviation accident data obtained from the NTSB and the FAA. This is the Human Factor Analysis Classification System (HFACS).

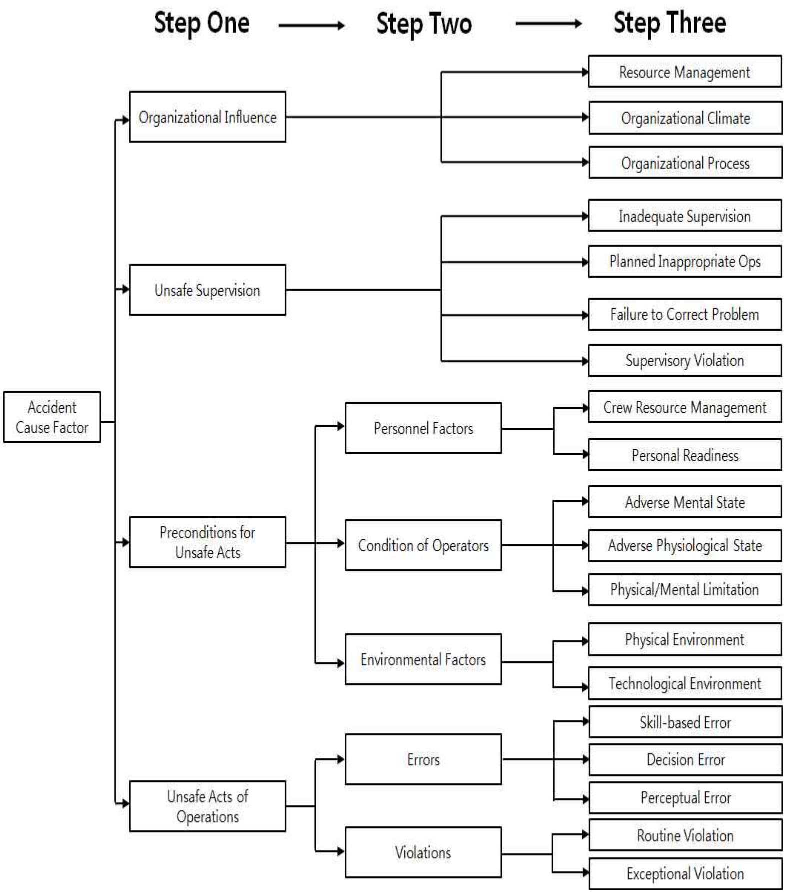
The Swiss cheese model is divided into four stages, three of which deal with the more subtle factors that create the potential for an accident, and a fourth one that deals with the more obvious unsafe actions taken by the flight crew just before an accident occurs. These four stages are: the impact of the organization, unsafe supervision, preconditions for unsafe acts, and unsafe acts. The four stages explain an accident and the stage most closely related to each error, and they classify the main components and causes using the categories of unsafe activity.[15]

We should perform analysis using the HFACS system to understand the point of view of the accident investigator and back to the point of the accident. For example, when an accident is caused by the pilot's excessive takeoff

15) Jung, Young Tak., A Study on Causal Factor of Mishap By Human Factors: Based on HFACS, Gyeongsang University graduate school, Master thesis, 2005, p.26.

decision, this is considered an unsafe act by the aircraft operator. The next step is to decide whether this act was an error or a violation. If the analysts confirm that the action was an error of any kind, then the error will be classified again.

<Figure 2> Steps required to classify casual factors using HFACS



(source : A Human Error Approach to Aviation Accident Analysis, Douglas A. wiegmann, Scott A. shappell)

2. ECCAIRS's Explanatory Factors taxonomy

ECCAIRS's Explanatory Factors Taxonomy contains the human factors data. The human factors data is explained by applying the SHEL model. The SHEL model was developed by Elwyn Edwards in 1972 and later amended (and renamed SHELL) by Frank Hawkins in 1987. It is a graphic for systematically displaying and synthesizing the interactions between the flight crew and the aircraft equipment.[16)]

There are four elements. The first element is S, which stands for "Software", it includes the checklist, symbols, and the laws or flight procedures relating to aircraft operations. The second element is H, which stands for "Hardware"; it represents all the equipment related to aircraft operations. The third element is E, which stands for "Environment"; it represents the surrounding environment, the cockpit lighting, humidity, temperature, pressure, oxygen levels, noise, jet lag, etc. The fourth element is L, which stands for "Liveware"; it represents the human flight crew . Each of these elements should have optimal conditions established for achieving a perfect execution of duties at all times.[17)]

ECCAIRS's Explanatory Factors Taxonomy consists of five hierarchical structures. Its detailed classification system can be seen in Table 5.

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16) Byun, Sun Cheul., A Study on Building Accident Investigation Tool of Human Factor through Example of CFIT Aircraft Accident, Korea Aerospace University, August 2009,
17) http://www.airportal.co.kr, 22 June 2010.

<Table 5> ECCAIRS's Explanatory Factors Taxonomy

Main Category(5)	Medium Category(23)	Small Category (102)	Detailed (Ⅰ) (319)	Detailed (Ⅱ) (90)
Liveware (human)	Physical/sensory limits	3	9	7
	Human physiology	5	47	16
	Psychological limitations	10	66	25
	Personal work management	5	1	-
	Experience & knowledge	3	20	12
Liveware-Environment	Physical environment	6	26	-
	Psychosocial factors	5	6	-
	Company/regulatory issues	5	11	-
	Operational task demands	5	23	4
Hard/software interface	Human/hardware interface	6	19	14
	Inadequate info sources	2	8	7
	Human software interface	2	7	-
	Automation systems	2	10	-
	Automatic defence/warning	3	7	-
	Operational material	4	13	-
Human - Software	Human v procedures	8	4	-
	Human v training	9	6	-
	Human/sys interface-other	-	-	-
Interface between humans	Human v communications	3	21	5
	Human v team skill/CRM	4	13	-
	Human interface-support	4	-	-
	Human v regulatory activities	8	2	-
	Other human human interface	-	-	-

(source : www.icao.int)

3. Comparison and analysis of HFACS and Explanatory Factor Taxonomy

Almost all aviation accidents involve human error. In fact, approximately 70-80 percent of accidents are known to have been caused by human factors. Therefore, when studying aviation accident taxonomy, the classification of human factors in aircraft accidents should be considered as well. We analyzed and compared HFACS and ECCAIRS's Explanatory Factors in Table 6.

<Table 6> Comparison of HFACS and Explanatory Factor Taxonomy

	HFACS	Explanatory Factors
Model	HFACS Model (Base on the Swiss model)	SHELL model
Taxonomy structure	▪ Divided into 4 main stages. Also, it classifies main component and range of causes. ▪ Data with 3 hierarchical structures is released and it classified in detailed for request from each airlines and agency.	▪ SHELL model with a hierarchical structure, consists of main (5), medium (23), small (102), detailed (1-319), and detailed (2- 90) classification and element has relationship with each other.
Features	▪ 4 stages based on the potential and appeared mistake. These 4 stages are unsafe acts, preconditions for unsafe acts, unsafe supervision, and the impact of the organization.	▪ We can recognize relationship among human, equipment, and environment which are elements of SHELL theory. However, it is complicated to analyze so it can not be used in investigation.

The components of data are divided into five hierarchical structures in the Explanatory Factors Taxonomy of ECCAIRS. Nevertheless, we can recognize the relationship among humans, equipment, and environment which are the elements of the SHEL theory, although it is complicated to analyze. Hence, it cannot be used in investigations. In order to more precisely investigate the accidents that are caused by human factors, we can use HFACS to analyze the data from civil aviation accidents.

V. Directions to introduce domestic aviation accident taxonomy

Currently, the Republic of Korea utilizes ECCAIRS, which is the aviation accident reporting system used in Europe. The ECCAIRS which was developed on the basis of ADREP 2000 Taxonomy is the standard aviation accident reporting system recommended by ICAO. Accordingly, we need to establish a new taxonomy that is based on the ECCAIRS Taxonomy. Also, this new system should coincide with the ECCAIRS system for adopting a domestic aviation accident classification system.

Furthermore, it is necessary to adopt a human factor analysis system and taxonomy because human factors are the main cause of aviation accidents. ECCAIRS's Explanatory Factors Taxonomy contains human factor data, but we cannot apply that system to a human factor investigation as we explained above. Therefore, we should consider adopting HFACS, which is the most common system, because HFACS can explain human factor data better than ECCAIRS. Basically, HFACS classifies data within three hierarchical structures and divides it into four main stages. It is an established, detailed taxonomy adopted by each airline and agency.

Ⅵ. Conclusion

In light of the major revisions from Annex 13 of ICAO, countries should use a standardized format to collaborate with each database system in order to build a network of global aviation safety information. Therefore, a study of aviation accident classification systems is considered basic research for building an aircraft accident and incident database.

First of all, we investigated the aviation accident taxonomies among ICAO, the United States, and Europe. Then, we analyzed their recent statuses. In the case of ICAO, aviation safety information was collected through the ADREP system for 30 years, starting in 1974. However, in 2004, ICAO selected ECCAIRS, which is used in Europe, instead of ADREP. Data using ECCAIRS's Explanatory Factors Taxonomy has been developed on the basis of the ADREP 2000 Taxonomy. Moreover, because the data is organized in a much broader and more complex hierarchical classification system, we can analyze collected aviation safety information in detail and discover the causes of accidents so that accuracy will improve for preventing future accidents. The U.S.'s leading aviation safety system, ASIAS, sorted a wide range of aviation safety information from a variety of database systems and integrated it. The system stored information such as accidents and incidents, as well as air traffic, aircraft, airports, and materials. We expect that the system will play a major role in reducing aviation safety risks and preventing aviation accidents. Also, CICTT, the ASIAS taxonomy developed by CAST and ICAO, has five different taxonomies and continues to develop more. As a result of comparative study related to the taxonomy of human factors, most parts of the ECCAIRS Explanatory Factors Taxonomy contain human factor data. However, it is not suitable for investigating human factors because the HFACS system is required for better explanation of human factors.

We set out to determine the best domestic aviation accidents taxonomy based on the taxonomies of international aviation accidents and human factors related to results of classification comparison and analysis. We should adopt an accident and incident reporting system based on the ECCAIRS system. Furthermore, if we need to analyze human factors separately, we should use HFACS.

Our conclusion meets the major revision of ICAO Annex 13 that mentions that accident and incident database systems should use a standardized format and recommends that each country establish an aviation safety information system to gather, analyze, and share accident information. We analyzed precisely the major cause of human factors by researching taxonomies so that we can discover new methods. These methods will analyze information and data effectively and decide which prevention activities are necessary for the future. Therefore, this study will contribute to a reduction in accident rates worldwide.

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Abstract

The international community has done a lot of effort to improve the aviation safety. The new high technologies, systems and development of navigation equipments considerably improved the level of aviation safety.

However, the aviation accident rate has been showing unchanged status without the decline since 1980. It means it is difficult to secure enough safety by the existing efforts to improve the aviation safety, eventually needs new methods for the accident prevention.

With this in mind, the nations interest new methods that can consider a countermeasure by realizing potential risk factors before fatal accidents. In other words, that is to analyze and share the safety information collected from accidents by establishing aviation safety information system.

To establish international aviation safety information system, each country's aviation accident · incident reporting systems are need to be established. Also aviation safety data taxonomy is need to be standardized. Then, aviation users will communicate the information efficiently.

This study investigates and considers each country's aviation accident · incident database taxonomy for the analysis of the aviation data and the necessary prevention activity. This will contribute to a better international aviation safety and strengthen the country's aviation diplomacy.

Key Words : Aviation Safety , Fatal Accident, aviation safety information system, taxonomy, Accident investigation

초 록

한국의 항공안전 데이터베이스 분류체계에 관한 연구

이 강 석*

국제 사회에서는 그 동안 항공안전의 향상을 위하여 많은 노력과 활동을 전개하여 왔다. 새로운 첨단기술과 시스템, 그리고 전 세계 어디서나 보다 정밀한 항행을 할 수 있도록 도와주는 항법장비의 발전은 항공안전의 수준을 상당히 향상시켜 왔다.

그러나 전 세계의 항공 사고율은 1980년대 이후부터 별다른 감소 추세 없이 계속해서 정체현상을 보이고 있다. 이는 기존의 항공안전 향상을 위한 노력만으로는 이제 더 이상 항공기의 안전 운항을 보장해 줄 충분한 수준의 안전 확보가 어렵다는 것을 의미하며, 결국 사고예방을 위한 새로운 방법이 필요하게 되었다.

이러한 점을 주목하여 전 세계 항공국들은 항공기 사고로 인명 또는 재산상의 손실이 발생하기 전에 전 항공시스템 내에서 초기 위험요소들을 사전에 인지하여 그에 대한 적절한 개선 대책을 개발할 수 있는 새로운 방식에 관심을 가지게 되었는데 그것은 항공안전정보시스템의 구축을 통한 안전정보의 수집·분석·공유를 하는 것이다.

세계적인 항공안전정보시스템을 구축하기 위해서는 각 나라의 정보들을 수집하고 분석할 수 있는 항공사고·준사고 보고시스템 구축을 기본으로 이용자 간에 자유스럽게 교환이 이루어져야 한다. 또한 시스템을 구성하는 항공안전 데이터들의 분류체계가 표준화되어 이용자간의 정보가 원활히 소통될 수 있어야 하겠다.

이 연구에서는 항공안전 정보를 효과적으로 분석하고 필요한 예방활동을

* 한서대학교 항공교통관리학과 부교수

결정할 수 있는 각 나라의 항공사고・준사고 데이터베이스 분류체계를 조사를 통하여 세계 항공안전 강화에 기여함은 물론 국가 항공 외교력 증진에도 도움이 되고자 한다.

주제어 : 항공안전, 항공사고, 항공안전정보시스템, 분류체계, 사고조사