

民用航空飛航安全績效之檢測評估

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摘要

臺灣地區近十年來飛安事故頻繁的紀錄顯示出，於高運量、高航速及高密度航班下之航空運輸產業，其飛航安全係為民航運輸不可輕忽之一環，且民用航空飛航安全系統績效之提昇係為目前政府相關單位與民航業者所面臨之重要議題。然目前飛航安全系統之相關研究與科技發展，甚少著墨於之整體飛安績效提昇與安全管理計畫之研訂，本研究目的即為建立完善之民用航空飛航安全績效檢測指標體系，藉由模糊理論之應用分析以求得安全檢測指標間之相對權重體系，並針對我國民用航空之飛航環境及系統安全性作一檢測與評估。

研究為對於民用航空飛航安全之研究議題有所廣泛而深入的瞭解，係考量國內外相關民用航空運輸安全系統架構及回顧相關安全管理文獻，並進而對我國民用航空飛航安全系統環境做一全盤性了解，據以研擬民用航空飛航安全績效檢測指標及準則。研究研擬之飛航安全檢測指標體系，係依民用航空特性分為「飛行員飛航操作」、「航空公司航務操作」、「航空公司機務操作」、「航站作業管理系統」以及「飛安管理作業系統」五大構面。為結構化檢測評估指標及項目，及消弭問卷調查之語意模糊性、資訊不明確性等問題，研究將以模糊層級分析法建立評估指標體系之相對權重體系，利用語意模糊數轉換模糊語詞，最後係利用模糊極大極小貼近度據以評等分析飛安績效值。

於實例分析方面，研究之績效檢測評估主要分為「飛航安全管理系統」與「航空公司飛安績效」二個部分，於「航空公司飛安績效」檢測部分，評估對象係為國內六家民用航空運輸業者，意涵「航空公司航務操作」、「航空公司機務操作」二大構面。研究分析顯示「飛航安全管理系統」績效評定係屬於**優等 (B)** 等級；另外，於「航空公司飛航安全績效」等級分析顯示，國際線航空運輸業者之飛安績效值皆較國內線業者優異許多，分析研判係由於航空公司經營規模之不同而造成飛安系統資源呈現相對應之差異性存在，造成飛航安全資源較難公平有效地分配於各航空公司安全系統之執行運作。

本研究探討分析結果，期提供相關民航主管單位與航空業者作為改善我國飛航環境和提昇飛航安全之參考依據，藉此預防潛在飛安危險因素與提昇飛航安全績效。

關鍵詞：飛航安全績效檢測指標、模糊理論、績效檢測評估、模糊層級分析法

Evaluation and Inspection of Domestic Civil Aviation Safety Performance

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Abstract

A number of recent and highly publicized fatal aircraft accidents, within the Taiwan regional airlines industry, has highlighted flight safety is the most important issue in civil aviation. Despite this need, there are currently few proactive safety management programs that are practical, effective, helpful and which reliably demonstrate improvements in aviation safety performance. Improving domestic civil aviation safety and ensuring the safety of passengers are the objective and obligation to be faced by the government and all airlines. The purpose of the research is to establish a valid index for the evaluation and inspection of the performance of aviation safety to the nature of domestic civil aviation, to assess the relative weights of safety attributes using Fuzzy theory and apply them to the empirical study of the performance of domestic civil aviation safety.

To establish a valid index for the evaluation and inspection of the performance of domestic civil aviation safety, the research takes an overview of literatures relating to aviation safety both at abroad and home, and aviation administrative system, furthermore investigates current civil aviation safety system in Taiwan. According to the characteristics of indices, the hierarchical structure of the evaluation criteria for the aviation safety performance evaluation program is constructed based on five performance dimensions: pilot's flight operating, airline flight operations, airline maintenance operations, airport operating system, and aviation administrative systems. In order to structure the performance indices and items, get rid of linguistic vague in questionnaire survey linguistic and information uncertainty, the research is to assess the relative weights of safety attributes by means of Fuzzy Analytic Hierarchy Process (FAHP) method, transform the linguistic expressions into fuzzy number, and finally equalize the performance value of airlines by max-min close of degree method.

The empirical performance evaluation may be divided into two aspects, say government administrative side and airlines' performance side. The evaluation of airlines' safety performance takes six major airlines in Taiwan as empirical study, evaluating the performance of airlines' flight operations and maintenance operations. Generally speaking, the performance evaluation of government administrative is excellent. In other hand, according to the performance evaluation of airline safety, the operators managing overseas flight display the best performance and the operators managing domestic flight the worst. The research helps administrative department and operators of regular public transport aircraft understand their relative safety strengths and weakness in term of safety attributes, prevent the accidents from happening in advance and finally enhance the domestic civil aviation safety.

Keywords : civil aviation safety index, Fuzzy theory, performance evaluation, Fuzzy Analytic Hierarchy Process