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Ranking human factor risks for quality manager in aviation environment by using Analytical Hierarchy Process (AHP)

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Quality management is required for sustanability of the aviation operations; because quality management system provide business envoriment to maintain operations both safe and secure by considering regulations. Aviation organizations such as Airlines, Airports, Air Naviagation Service Providersi Maintenance Organizations etc. shall establish quality management system to meet their objectives such as flight safety, airworthiness etc. in compliance with appropriate technical standarts and aviation regulations completely related to operations in cost effective manner. Organizations such as Airports shall meet its quality objectives, implement aviation regulations and satisfy the certificiation requirement and prepare manuals, procedures-Aerodrome Manual- required by regulator such as Directorate General Of Civil Aviation (DGCA) in Turkey. Safe and airwothy of aircraft or airport are provided by execution of the aviation activities completely. The Quality Manager perform a critical function in the aviation organizations and inevitably responsible for the coordination of organizations overall quality activities taking into account regulatory needs and perform audit process which provides the feedback mechanism about the status of aviation operations and where to make improvements. The quality management system is driven by quality manager, who ensures compliance with relevant aviation operations regulations and to achieve the organizations objectives, quality manager carry out the internal audit process correctly. Quality management is vital to manage both legal and compliance with regulations based risks in operational environment because errors in aviation opeartions are extremely dangerous, and even the smallest error can be fatal. In this study, firstly human risk factors especially for quality manager in aviation environment are categorized as individual-related factors such as not following update aviation regulations, lack of expertise (technical knowledge), lack of experience, social maladjustment, aggressiveness, indiscipline, fatigue and organizational-related factors such as time pressure, lack of management support, corporate change/restructuring due to layoffs, reorganizations, pay cuts, etc., taking inappropriate given personnel training such as quality management, auditor, etc. These are important human factor risks for quality manager in aviation industry. Afterwards these risks are evaluated and ranking by using Analytical Hierarchy Process (AHP), the most important multi-criteria decision technique (MCDM) developed by Thomas Saaty, taking experts opinions' in the aviation sector and take into consideration also qualitative factors in decision making problems. AHP has been largely used by researchers in different industries and is considered to be very useful technique for ranking these risk factors via using The Expert Choice program. The "priorities" of human factor risks that have influence on quality manager error is determined by using AHP method in this study. Risk has two dimension such as "the probability/likelihood and impact/severity". Human factor risks are weighted in terms of probability and impact separately via AHP technique in hierarchical structure because AHP is a great method to obtain relative weights of each risk and to select the highest risk category. The results of AHP model may guide to the relevant aviation organizations when risk assessments method performed by determining and ranking risk factors properly. This study is carried out by taking into account the senior management level who may handle the risk mitigation plans. It is essential importance to manage the human factor risk in the quality department, especially related to the quality manager, for the quality sustainability of the airport or other aviation operations. Ranking human factors risks will be provided benefit for senior management to be managed through a proactive approach. It is also highly important that the development of AHP model for different organizations will lead to the raising of awareness for similar applications. This work taking into human factor risk with AHP model may contribute literature and human factors field. This study results can serve as a model to other employees working in aviation industry and be used to decide on many similar risks for managers.

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