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Developing a Conceptual Model of Organizational Safety Risk:Case Studies of Aircraft Maintenance Organizations in Indonesia

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Abstract

In Indonesia, the rate of accident and serious incident of aircraft have reached alarming stage. National Transportation Safety Committee affirmed that human errors played the biggest role from period 2007 – 2013. Although there are several possible causes for human error, one of the most critical elements is the quality of Aircraft Maintenance Organization, especially the human resources.To get basic knowledge of human factor, the first step of this study is literature study. The literature reviews showed that there are at least four factors that influenced human errors. They are Organizational Design, Safety Climate, Safety Performance, and Safety Outcome. After the factors were discovered, the next step is choosing the methodology. Since most of the literatures used models to describe the situation, this study will use similar approaches. Ostroff et al Model (2003) and Christian et al Model (2009) are chosen among the model because they can represent the most accurate situations in Aircraft Maintenance Organization in Indonesia. To get an added value, after these two model are merged, Principle of Hoffman (2003) is used to give a better and upgraded model. The proposed model is then explained through six proposed hypotheses, in which two of them are the added values. To collect the suitable data for the model, the final step is deciding the operational variables which are described on the form of tables for each factor. Each variable is tested through sub-model. Method used for gathering data is questionnaire which uses Likert scale test. The result of Likert scale test and the sub-models will become the proposed model. The proposed model is expected to give Aircraft Maintenance Organization a better understanding on human error and make them focus their improvement on human factor more so that the rate of accidents and serious incidents in Indonesia can be reduced significantly.

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*Keywords:*Aircraft Maintenance Organization, Organizational Design, Safety Climate, Safety Performance, Safety Outcome

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1. Introduction

In Indonesia alone, through the National Transportation Safety Committee (NTSC), it is affirmed that the human factor is the main cause nearly 60% of aviation accidents in Indonesia, only 34% were attributed to technical problems and the remaining is environmental problems, this percentage indicates the phenomenon of human error that occurred in Indonesia, it shows that the Human Resources in the troubled aviation organizations and require an increase in flight safety service standards. In addition to human resources, technical issues also still has a high percentage as the cause of the accident, this shows that the field of aircraft maintenance needs attention because of the potential to reduce the level of safety.

Based on data from the NTSC rate of accidents and incidents has reached alarming stage. On the duration of the year 2007 - 2013, there were 87 Accidents and 82 Serious Incident in Indonesia, where the Papua Island ranked first with 26 Accidents and 19 Serious Incident and Java Island was ranked second with 20 Accidents and 21 Serious Incidents.By taking the average per year, data showed that in 2007 had the worst accident rate with a value of 3.14, the year 2008 has an accident rate of 2.93, and in 2011 had an accident rate of 2.51. Only in 2013 included in the limit with the accident rate of 0.46 accidents.

Ostroff et al, (2003) describes the completeness of the safety models require coverage and social culture integration (e.g. security climate) and structural (structural and safety practices of the organization) organizational aspects that affect safety.

Mohaghegh (2007) developed a framework of safety analysis organization called SoTeRiA (Socio-Technic Risk Analysis). This model describes the dynamics of technical problems, social and behavioral done in layers, on individual, group, and organization. Analysis of safety risk management involves multiple disciplines that are in a container called Safety Risk Analysis Organization. SoTeRiA explained that there is a theoretical relationship between the organization's safety culture, safety structures or practices of the organization, organizational safety climate with specific differences between the safety culture and safety climate.

Christian et al (2009) explains that the behavior of people (workers) and factors affect the situation of safety performances and safety outcomes in the form of accident or injury.

Organizational Structure On Aircraft Maintenance Organization in Indonesia

Organizational structure is a formal framework in which the framework of the job tasks are divided, grouped and coordinated, while organization design is preparing and modifying the organizational structure (Robbins, 2004). The explanation shows that the role of the organizational structure of a company is crucial to the achievement of organizational goals.

Each Aircraft Maintenance Organizations officially registered by the Directorate of Airworthiness and Aircraft Operation, Ministry of Transportation of Indonesia, should have the same basic organizational structure in accordance with the standards set by the existing regulations. Aircraft maintenance organization refers to the standardized work. The job holder has little freedom as to what to do, when to do it and how to do it. Work should refer to the manuals and documents that are written in the organization.

Understanding which states that management and organizational factors as major contributors to the problem of operational safety has been studied by various methods of quantitative safety and risk assessment which led many to believe that the causal modeling is an effective way to assess the effects of the risk factors of safety organizations (Mohaghegh, 2007). However, there are a number of major challenges in developing construct models of organizational safety performance. Field studies have revealed the fact that salvation is achieved from safety culture application (Kennedy et al., 1998).

Thus, this study begins by describing the conceptualization construct a model of safety by doing integration between structural effects model organization (Ostroff, 2003) with the safety performance (Christian, 2009) which refers to the results of the safety outcomes. Models of organizational effectiveness are used as the basic model of the organizational safety, because the organizational structure is the controlling behavior, and is defined as the value of the safety of certain behaviors produced in accordance with the organizational structure (Suryaningsum, 2008).

From these explanations it is clear that safety is one of the desirable attributes of the performance of the organization,this attribute must be beneficial and at the same time provide a sense of security. The performance of the organization should consider the interaction of safety performance with output of other organizations, such as