

RISK MANAGEMENT ON SAFETY AND HEALTH PERFORMANCE IN  
INFINEON TECHNOLOGIES (MALAYSIA) SDN. BHD.

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## DECLARATION

### Supervisor Confirmation

I / we acknowledge have read this thesis and in my/we opinion, this thesis is adequate in term of scope and quality for the award of Bachelor Degree of Technology Management (Innovation)

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## DECLARATION

“I hereby declare that the work in this report is my own except for summaries and quotations which have been duly acknowledged.”

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## DEDICATION

I dedicate my dissertation work to my family and many friends. A special feeling of gratitude to my loving parents, Hus Bandeh and Mereha Kupon whose words of encouragement and push for tenacity ring in my ears. Thanks for all of the wonderful memories of growing up, and for your continued support and encouragement. I could not have asked for better parents or role-models. My sister Roziara, and Emenasya and my youngest brother Harris Vahid, who have never left my side and are very special.

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LOVE



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## ABSTRACT

*Hazard identification, risk assessment and control measure are the method that used to identify, analyze the possible of an undesirable event that could lead to a hazard and the risk of hazardous events. Diversity of techniques ranging from simple qualitative methods to advanced quantitative methods are used to identify and analyze hazards. Implementation of hazard control and risk assessment is to establish the mechanism of priorities based on the dangerous level of the particular activity that can cause major hazard and identifies some alternatives to reduce risk and eliminating possible hazards. In this case study, the research is focused on the hazard managements and risk assessment within the organization of the HSE department at the Infineon Technologies AG company. The study aiming is to develop a risk assessment and identify possible hazards and risks in the organization. To attain this, the simple quantitative methods are used to help identify and analyze hazards. The appropriate risk control measures and standard model hazard control are proposed to improve current hazard management. At the end of this research, all the three objectives that are stated in this research have been achieved. As a result, the three variables of risk management (risk assessment, hazard identification and control measure) are significantly important towards the improvement of health and safety performance of the company.*

## **ABSTRAK**

*Pengenalpasti bahaya, penilaian risiko dan cara mengawal adalah kaedah yang digunakan untuk mengenal pasti, menganalisis kemungkinan satu peristiwa yang tidak diingini yang boleh membawa kepada bahaya dan risiko kejadian yang berbahaya. Kepelbagaian teknik-teknik yang antara kaedah kualitatif yang mudah hingga lanjutan kaedah kuantitatif digunakan untuk mengenal pasti dan menganalisis bahaya. Pelaksanaan penilaian kawalan dan risiko bahaya adalah untuk mewujudkan satu mekanisma keutamaan berdasarkan tahap bahaya aktiviti-aktiviti tertentu yang boleh menyebabkan bahaya besar dan mengenal pasti beberapa alternatif untuk mengurangkan risiko dan menghapuskan bahaya yang berkemungkinan. Dalam kajian kes ini, kajian ini adalah tertumpu kepada pengurusan bahaya dan penilaian risiko dalam organisasi Jabatan HSE di Infineon Technologies (Malaysia) Sdn. Bhd. Kajian bertujuan adalah untuk membangunkan penilaian risiko dan mengenal pasti risiko-risiko dalam organisasi dan bahaya yang berkemungkinan. Untuk mencapai kaedah ini, kaeda-kaedah kuantitatif yang mudah digunakan untuk membantu mengenalpasti dan menganalisis bahaya. Langkah-langkah pengawalan risiko yang sesuai dan kawalan bahaya standard model dicadangkan untuk memperbaiki pengurusan bencana. Pada akhir penyelidikan ini, semua tiga objektif yang dinyatakan dalam penyelidikan ini telah tercapai. Hasilnya, tiga pembolehubah pengurusan risiko (penilaian risiko, pengenalpastian bahaya dan cara mengawal) nyata sekali penting ke arah peningkatan kesihatan dan prestasi keselamatan syarikat.*

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## LIST OF ABBREVIATIONS

PPE	-	Personal Protective Equipment
HAZOP	-	Hazard and Operability
QRA	-	Quantitative Risk Analysis
FMEA	-	Failure Mode and Effect Analysis
FTA	-	Fault Tree Analysis
FMECA	-	Failure Mode Effect and Critical Analysis
OSH	-	Occupational Safety and Health
$\alpha$	-	Alpha
$\beta$	-	Beta
f	-	Frequency
%	-	Percentage

## CHAPTER 1

### INTRODUCTION

#### 1.1 Background

For any industry to be successful, it should encounter not only the production requirements, but also keep the highest safety standards for all concerned. The industry has to identify the hazards, assess the associated risks and bring the risks to a tolerable level on unremitting basis. Manufacturing of semiconductor which required a high level of chemical purity being a hazardous operation has considerable safety risk to their employees. Practices in their employees lead to a number of accidents and causes loss and harm to human dwellings, damages the property, amputate production and risky conditions. Risk assessment is a systematic method of identifying and analyzing the hazards associated with an activity and establishing a level of risk for each hazard. The hazards cannot be completely eliminated, and thus there is a need to define and estimate an accident risk level possible to be presented either in the quantitative or qualitative way.

Because of the existing hazards in semiconductor activity and the complexity of its machinery and equipment and the associated systems, procedures and methods, it is not possible to be naturally safe. Regardless of how well the machinery or methods are designed, there will always be potential for serious accidents. It is not feasible for an external agency to ensure the safety of an organization such as Infineon Technologies (Malaysia) company nor of the machinery or methods it uses. The principal



responsibility for the safety of any particular activities and the manner in which it is operated rest with the management of that manufacturing. It is widely accepted within industries in general that the various techniques of risk assessment contribute greatly toward improvements in the safety of complex operations and equipment. In many industries, there is a legislative requirement for risk assessment to be undertaken of all hazardous equipment, machinery and operations taking account of the procedures used for operation, maintenance, supervision and management.

Risk management involves the identification of undesirable events that leads to a hazard, the assessment of hazard mechanism by which this undesirable event could occur and generally the estimation of extent, magnitude and likelihood of harmful effects.

## 1.2 Problem Statement

The semiconductor industry's safety record has always been poor. It remains one of the dangerous industries in which to work. The main purpose of this research is to study the implementation of risk management that brings toward enhancement of the health and safety performance. This research is focusing on Infineon Technologies (Malaysia) Sdn. Bhd., one of the largest semiconductor manufacturers in Malacca. Most of the semiconductor industries still have number of accident and harms even though the existing of conducting informal risk management in their company. The factors that contribute to the increasing rates of industrial accidents are:

- 1) There is no hazard identification procedure to identify the hazards in the working environment. Hazard identification process is incomplete and potential hazards are left unidentified.
- 2) The risk assessment process is very unlikely happening and it does not conduct, according to the legislative law of risk assessment.
- 3) No control measures are taken to eliminate or reduce the risks of facing these hazards.

### 1.3 Research Questions

The research question would focus on the area of exploring the process of risk management used in practice within Infineon Technologies (Malaysia) Sdn. Bhd., in Malacca and identify if they believe any recommendations might improve their level of safety performance in the company. There are several research questions that needed to investigate which have been identified as follows:

- 1) What is the relationship of risk assessment, hazard identification and control measure with health and safety performance in Infineon Technologies (Malaysia) Sdn. Bhd.?
- 2) Which factor contributes more to health and safety performance in Infineon Technologies (Malaysia) Sdn. Bhd.?
- 3) Does the gap exist between the managers and workers regarding their perception on implementation of risk management in Infineon Technologies (Malaysia) Sdn. Bhd.?

## 1.4 Research Objectives

In order to achieve the underlying purpose, it is essential to determine the objective of the study. The objectives of this research are:

- 1) To identify the relationship of the (i) risk assessment, (ii) hazard identification, and (iii) control measures with health and safety performance in Infineon Technologies (Malaysia) Sdn. Bhd.
- 2) To determine the factors that contribute towards the health and safety performance in Infineon Technologies (Malaysia) Sdn. Bhd.
- 3) To analyze the gap between managers and workers regarding their perception on implementation of risk management in Infineon Technologies (Malaysia) Sdn. Bhd.

## 1.5 Scope Of Study

In this study, the researcher will separate into two scopes which are the implementation of risk management and the safety and health performance in the Infineon Technologies (Malaysia) Sdn. Bhd. These scopes are related with each other. Risk management is an important step in protecting workers in a company, as well as complying with the law. It helps focus on the risks that really matter in the workplace and the ones with the potential to cause harm. The current level of effectiveness of the implementation of risk management will be analyzed to measure the efficiency in improving their safety and health performance. Based on the adoption of these steps acquired, the measurement of safety and health performance will be determined according to the statistic of accidents, fatal injuries and death among the workers in the Infineon Company. The higher effectiveness of the implementation of risk management in the company, therefore their safety performance will increase and the lower the statistic of their fatal injury.

In many instances, straightforward measures can readily control risks, for example, ensuring spillages are cleaned up promptly so people do not slip or cupboard drawers kept closed to ensure people do not trip. For most, that means simple, cheap and effective measures to ensure your most valuable asset – your workforce – is protected. The law does not expect companies to eliminate all risk, but they are required to protect people as far as is „reasonably practicable“.

## **1.6 Limitation Of Study**

In this study, the researcher will limit into employees in the Infineon Company in Malacca only. The main focus will be all departments, especially the Health and Safety Executives (HSE) department in the Infineon Company. This is including the company area, workers, managers and senior managers from various of departments within the Infineon Technologies (Malaysia) Sdn. Bhd.

## **1.7 Significance Of Study**

A risk management is an important step in protecting the workers and organization, as well as complying with the law. Risk management will help to prioritize risks and provide information on the probability of harm arising and severity of harm by understanding the hazard, combine assessments of probability and severity to produce an assessment of risk and it is used in the assessment of risk as an aid to decision making. In this way, Infineon Technologies (Malaysia) Sdn. Bhd. will be able to implement safety improvements. Different types of approaches for the safety in the organization, various tools and appropriate steps have to be taken to make the workplace better and safer.

Risk management is a systematic way to identify and analyze hazards to determine their scope, impact and the vulnerability of the built environment to such hazards and its purpose is to ensure that there is a formal process for hazard identification, risk assessment and control measure to effectively manage hazards that may occur within the workplaces. The significance of this study is to give impact on future for safety awareness among all employees in Infineon Company as well as adoption of risk management in their HSE departments. The improvement of this approach or method will gives greater contributions to their safety performance in the semiconductor based company.

## 1.8 Summary

Overall, the study will explain the relationship between the adoption of risk management and safety performance in Infineon Technologies (Malaysia) Sdn. Bhd. Throughout this research, the researcher will focus on determining and analyzing the importance of risk assessment in Infineon Technologies (Malaysia) Sdn. Bhd. Since the risk management is well known concept so the researcher needs to study further and closer what is actually the actual contributions of this concept especially in health and occupational health field. Does the closer and detail implementation of risk management, which, according to the MSOSH will reduce the accident injuries in the company? So, any recommendation regarding improvement in adoption of risk management or any methods or tools that might help in reducing accident injuries Infineon Company will be encountered to increase the safety performance. Hence, it will decrease the statistic of accidents, fatal injuries and death as well in semiconductor based company.

## CHAPTER 2

### LITERATURE REVIEW

#### 2.1 Introduction

The worldwide semiconductor industry faces a broad scope of hazards and risks to employees, which may as well shift over time, work activity, and geographic localization. According to Bernhard Zimolong and Gabriele Elke risk management may be defined as the reduction and control of the adverse effects of the risks to which an organization is exposed. However, The European Foundation for Quality Management (2005) is somehow less verbose. They define it as the systematic use of organization-wide processes to identify, assess, manage, and monitor risks – such that aggregated information can be used to protect, release, and create value. Put simply, risk management aims to provide decision makers with a systematic approach to coping with risk and uncertainty.

An effective OHS risk management operation is an integral component of a healthy Occupational Health and Safety Management System. This procedure describes the steps that are to be taken to ensure so far as is reasonably practicable, that health and safety hazards are identified in Infineon Technologies (Malaysia) Sdn. Bhd. and controls implemented to eliminate or mitigate the risk to persons as far as is practicable.

The essential tasks of risk management are to (1) determine what hazards present more danger than society (as mapped by its government) is willing to accept; (2)