CHAPTER 1

INTRODUCTION

1.1 BACKGROUND OF STUDY

An earthquake is the consequence of an unexpected release of energy in the Earth’s crust. This sudden energy release causes the seismic waves that make the ground shake that could create seismic waves. Due to the consequence rock breaking, the result in energy waved which is seismic wave. It is a kind of energy that travels all the way through the earth. Seismic waves pass through either the length of the earth's surface or through the earth's interior.

Earthquakes are usually triggered when rock underground suddenly breaks along a fault. Fault plane is the underground surface along which the rock moves and breaks. By using seismograph it will determine the magnitude or size by measuring the amplitude of the seismic wave that occurs and the distance of seismograph from the earthquake. The seismograph consists of a seismometer (the detector) and a recording device that located at every station of possibility of an earthquake occur. The seismometer device will electronically amplifies the wave motion in earth.
Earthquakes caused too many damaging effects to the surrounding they act upon. This includes damage to man-made buildings structure and in worst cases the human death. The destruction of structures such as bridges, dams and buildings are caused by the rumbling impacts which originated from the earthquake. Besides, earthquake can also trigger landslides that have bad effect on human life and animal life.

Earthquakes usually cause dramatic changes, including ground movements, dropping, dropping, and tilting of the surface cause different in the groundwater flow. Other than producing floods and damaging the buildings, earthquakes that occur under ocean can sometimes cause tsunamis or known as tidal waves. The tsunamis’ conditions are high water which travel at a short period of time. They are surely destroying area in coastlines which effect entire populations and cities.

1.2 PROBLEM STATEMENT

On 26 December 2004, the coastal area off northern Sumatra, Indonesia had been struck by huge and massive earthquake which then triggered tsunamis around the neighboring countries such as India, Maldives, Malaysia, Thailand and Sri Lanka. Due to the massive earthquake that occur in Northern Sumatra, Indonesia magnitude 9.0 in Ritcher scale, Malaysia was affected critically by this natural disaster. The earthquake in Indonesia had triggered tsunamis in coastal area Malaysia that caused to serious injuries, loss of human life, damage to man-made structure and etc.

Although Malaysia is near to the epicenter of the earthquake, Malaysia escaped from the kind of damage that struck another countries nearby the Sumatra. Since the western coast Sumatra is the epicenter of earthquake, Malaysia is largely protected by that island from the worst case of tsunami. Even though Malaysia is safely protected but still there are some part
in Malaysia that been affected such as Penang and Langkawi. It reported that number the number of life loss are 68 where in Penang (52), Kedah (12), Perak (3) and Selangor (1). Malaysia which located at the peripheral of the fire ring and near to Indonesia and Philippines that known had always occurs seismological activities in the past few years, shows that Malaysia could have a chance of being struck by at least one moderate earthquake.

In year 2012, Malaysian Meteorological Department had detected eight earthquakes in the eastern part Malaysia, Sabah and Sarawak which have magnitude between 2 and 4.5 scale Ritcher (Bernama, 2013). This shows that Malaysia cannot ignored the threat of an earthquake since there was record for existing earthquake even in small magnitude. Besides, in 1976, the strongest earthquake, magnitude 5.8 had been recorded in Lahad Datu, Sabah. “Malaysia is close to areas that have experienced strong earthquakes, including Sumatra and the Andaman Sea, while Sabah and Sarawak are located close to the earthquake zone of South Philippines and North Sulawesi. Therefore, the odds of an earthquake striking Peninsula Malaysia cannot be ruled out,” (Dr. Mohd Rosaidi Che Abas).

In record, there are about less than 10% man made structure in Malaysia that consider earthquake in the design. Although tendency Malaysia to be struck by massive earthquake is quite slim, but supposed the design cannot ignored the threat for moderate earthquake. Since the damage by the moderate earthquake could defect the existing structure by presence of crack. Lately, Prime Minister 5th Abdullah Ahmad Badawi had highlighted about the importance of consider impact of earthquake in Eurocode standard toward design structure in Malaysia. Thus, it really important to take account the earthquake impact in structure especially in design of offshore platform.