



**THE EFFECT OF PROGRESSIVE CRACK ON DYNAMIC PROPERTIES OF
TAPERED BEAM USING EMA**

**MOHD HAFIZ BIN ZAINI
(2006134911)**

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**Faculty of Mechanical Engineering
Universiti Teknologi MARA (UiTM)**

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"I declare that this thesis is the result of my own work except the ideas and summaries which we have clarified their sources. This thesis has not been accepted for any degree and is not concurrently submitted in candidature of any degree"

Signed: 

Date : 24/5/2010

MOHD HAFIZ BIN ZAINI

UiTM NO: 2006134911

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ABSTRACT

Cracks in vibrating component can initiate catastrophic failures. The presences of cracks change the physical characteristics of a structure which in turn alter its dynamic response characteristics. Therefore there is need to understand dynamics of cracked structures. Crack depth and location are the main parameters for the vibration analysis. Along with the development of modern computer technology, experimental modal analysis has become the main tool for solving complicated structural vibration problems. Modal analysis is therefore made necessary as such measurement generates dynamic response of structures because natural frequency can indicate the deflection of the structure which also significant in determining of cracking. The scope of the project experiment modal testing is carried out on the uncracked and progressives cracked of mild steel tapered beam. Two boundary conditions were selected to carry out in the experiment such are Free Hanging and Simply Supported. Progressives cracks were seeded on a structure by using hacksaw. For a different crack depth the dynamic properties were determined. This project covers a technique experimental method by using db Real time Analyzer (dbRTA) or 01db Four Channel equipment and ME' Scope software. Then simulation and compare the result by numerical model finite element analysis with the help of ANSYS 5.7 software.

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