

**THE EFFECTS OF TRANSMISSION LINE RADIATION  
ON HUMAN PSYCHOLOGICAL CONDITION  
DUE TO BRAIN AND EMOTION USING  
RESONANT FIELD IMAGING (RFI)**

This thesis is presented in partial fulfillment for the award of the  
**Bachelor of Electrical Engineering (Hons)**  
**UNIVERSITI TEKNOLOGI MARA**  
(MAY 2006)



UNIVERSITI  
TEKNOLOGI  
MARA

**FAIZAH BINTI SHA'ARI (2002387891)**  
**Faculty of Electrical Engineering**  
**UNIVERSITI TEKNOLOGI MARA**  
**40450 SHAH ALAM, SELANGOR**

## **ACKNOWLEDGEMENT**

In the name of ALLAH s.w.t, the most beneficent and the most merciful, I would like to express my gratitude and appreciations to my supervisor, Pn. Aziati Husna binti Awang for his invaluable suggestions, guidance and constant encouragement.

I also owe a great debt to my friends Jimmy and Afzan for a valuable guidance and contribution in Visual Basic programming.

Special heartfelt thanks to all Menara TM and TM Annexe 1 staffs especially to En. Zafizal bin Zolkafli, the manager of Menara TM and all of Universiti Malaya students involved in this research. Without all of you, this research will not complete at all.

I would like to express my sincere to my beloved parent, En. Shaari bin Mamat and Puan Paridah binti Dawi, also to my beloved sisters for their support, love and understanding to make this research successful.

Last but not least, I would like to thank Mohamad Yusri and all of my friends for a given idea and encouragement throughout this research.

Faizah Binti Sha'ari  
Bachelor (Hons) Electrical Engineering  
Universiti Teknologi Mara  
40450 Shah Alam  
Selangor Darul Ehsan

## **ABSTRACT**

That electric fields can produce physiological and psychological effects has been known for hundred of years. It also has been clear to power transmission and distribution engineers that some of the largest, extremely low frequency (ELF) electric fields in our environment are to be found in the space underneath high voltage transmission lines. Rightly or wrongly, the question of possible impacts of these fields has become a major factor in hearings devoted to the sitting of new transmission lines. It is based from these questions of transmission lines that this paper work is made.

This research examines the effects of transmission line fields and radiations to human psychological condition due to human brain and emotion. This five-week research is made by comparing people that live or work nearby and far away from the transmission lines tower.

The measurement technique being used is Resonant Field Imaging (RFI), which is based on the concept of electromagnetic feedback and imaging. This RFI will detect the human frequencies using RFI Hand Hold Digital Frequency Counter and interpret the frequencies into Aura Color interpretation. Next, the final results of psychological effects were obtained using the Visual Basic 6.0 Software Analysis that has been designed.

# TABLE OF CONTENTS

CHAPTER	DESCRIPTION	PAGE
<b>1</b>	<b>INTRODUCTION</b>	
1.1	Introduction	1
1.2	Project Overview	7
1.3	Project Objectives	8
1.4	Scope of Thesis	8
<b>2</b>	<b>TRANSMISSION LINES</b>	
2.1	Introduction	9
2.2	Transmission Lines	9
2.3	Types of Transmission Lines	12
2.3.1	Overhead transmission lines	13
2.3.2	Subtransmission lines	14
2.3.3	Underground transmission lines	15
2.4	Electric Power Transmission Lines	15
2.4.1	Requirements of electric power service	16
2.4.2	Transmission and distribution systems	16
2.4.3	Standard frequencies, number of phases, voltages	18
2.4.4	Grid input	19
2.4.5	Grid exit	19
2.4.6	AC power transmission	20
2.4.7	High voltage DC (HVDC) power transmission	20
2.4.8	Communication transmission lines	21

<b>3</b>	<b>ELECTROMAGNETIC FIELDS</b>	
3.1	Introduction	22
3.2	The Fields of Extra High Voltage Transmission Lines	23
3.2.1	The electric fields	23
3.2.2	The magnetic fields	24
3.3	Electromagnetic Fields and Radiation Effects	25
<b>4</b>	<b>HUMAN PSYCHOLOGICAL</b>	
4.1	Psychological	26
4.2	Principles of Psychology	26
<b>5</b>	<b>HUMAN BRAIN</b>	
5.1	Introduction	28
5.2	Integrated Brain Functions	
5.2.1	Cerebral cortex	29
5.2.2	Visual cortex	30
5.2.3	Cerebellum	30
5.2.4	Pineal gland and pituitary gland	31
5.2.5	Limbic system	33
5.2.6	Parietal lobe	34
5.3	Frontal Lobes Functions	
5.3.1	Prefrontal cortex left and right brain	34
<b>6</b>	<b>EMOTION</b>	
6.1	Introduction	36
6.1.1	Evolution of emotion	36