

## CONTENTS

ACKNOWLEDGEMENT .....	iii
LIST OF FIGURES.....	vi
LIST OF TABLES .....	viii
NOMENCLATURE.....	ix
<b>1. INTRODUCTION.....</b>	<b>1</b>
1.1 RESEARCH MOTIVATION AND OVERVIEW.....	1
1.2 OBJECTIVES.....	1
1.3 RESEARCH METHODOLOGY.....	2
1.4 REVIEW OF LITERATURE.....	6
1.5 CHAPTER SCHEME.....	8
<b>2. PHOTO VOLTAIC THEORY .....</b>	<b>9</b>
2.1 OVERVIEW .....	9
2.2 PHOTOELECTRIC EFFECT .....	9
2.3 SOLAR CELL .....	11
2.4 PARTIAL SHADE BEHAVIOUR AND HOT-SPOT PHENOMENA.....	14
2.5 HOT-SPOT TESTING STANDARDS AND PROCEDURES .....	17
2.6 SUMMARY.....	24
<b>3. HYDROCARBON INDUSTRY EXPLOSIVE ATMOSPHERE .....</b>	<b>25</b>
3.1 OVERVIEW .....	25
3.2 FIRE BASICS.....	25
3.3 SOURCES OF HEAT .....	26
3.4 FLAMMABLE VAPOUR .....	28
3.5 FLAMMABLE DUST.....	29
3.6 SUMMARY.....	31
<b>4. SIMULATION OF PARTIAL SHADING AND EFFECT ANALYSIS.....</b>	<b>32</b>
4.1 OVERVIEW .....	32
4.2 POLY CRYSTALLINE PV MODULE (110 W <sub>p</sub> ) SIMULATION .....	32
4.3 MONO CRYSTALLINE PV MODULE (250 W <sub>p</sub> ) SIMULATION.....	42
4.4 SUMMARY.....	42
<b>5. EMPIRICAL RESEARCH ATTRIBUTES .....</b>	<b>43</b>
5.1 OVERVIEW .....	43
5.2 RESEARCH DESIGN ATTRIBUTES.....	43
5.3 TEST METHODOLOGY .....	44
5.4 TEST SPECIMEN.....	46
5.5 TEST SEQUENCING .....	47
5.6 HEALTH, SAFETY, ENVIRONMENT .....	50

5.7	SUMMARY.....	50
<b>6.</b>	<b>EXPERIMENTATION &amp; RESULTS.....</b>	<b>51</b>
6.2	RESULTS POLY CRYSTALLINE PV MODULE (100W <sub>P</sub> ).....	54
6.3	RESULTS POLY CRYSTALLINE PV MODULE (230W <sub>P</sub> ).....	54
6.4	RESULTS OF MONO CRYSTALLINE PV MODULE (250W <sub>P</sub> ) .....	54
6.5	SUMMARY.....	55
<b>7</b>	<b>DISCUSSIONS.....</b>	<b>62</b>
7.1	OVERVIEW .....	62
7.2	ANALYSIS OF POLY CRYSTALLINE PV MODULE (100W <sub>P</sub> ).....	62
7.3	ANALYSIS OF POLY CRYSTALLINE PV MODULE (230W <sub>P</sub> ) .....	68
7.4	ANALYSIS OF MONO CRYSTALLINE PV MODULE (250W <sub>P</sub> ) .....	73
<b>8</b>	<b>CONCLUSIONS AND FUTURE SCOPE.....</b>	<b>77</b>
	REFERENCES .....	79
	BIO-DATA OF RESEARCHER .....	82
	LIST OF PUBLICATIONS .....	84
	APPENDICES .....	85