

## LIST OF CONTENTS

<b>ABSTRACT</b> .....	ii
<b>VALIDITY SHEET</b> .....	iii
<b>ORIGINALITY STATEMENT</b> .....	iv
<b>FOREWORD</b> .....	v
<b>LIST OF CONTENTS</b> .....	vi
<b>LIST OF FIGURES</b> .....	ix
<b>LIST OF TABLES</b> .....	x
<b>CHAPTER I INTRODUCTION</b> .....	1
<b>I.1 Background</b> .....	1
<b>I.2 Problem Formulation</b> .....	7
<b>I.3 Purpose of Research</b> .....	7
<b>I.4 Benefits of Research</b> .....	8
<b>I.5 Writing System</b> .....	8
<b>CHAPTER II THEORETICAL BASIS</b> .....	10
<b>II.1 Occupational Health and Safety</b> .....	10
<b>II.2 Work Accident</b> .....	11
<b>II.3 Hazard</b> .....	13
<b>II.4 Risk</b> .....	14
<b>II.4.1 Risk Management</b> .....	14
<b>II.4.2 Risk Identification</b> .....	15
<b>II.4.3 Risk Classification</b> .....	15
<b>II.4.4 Risk Assessment</b> .....	16
<b>II.4.5 Risk Control</b> .....	16
<b>II.5 HIRARC</b> .....	17
<b>II.6 ISO 45001:2018</b> .....	18
<b>II.7 Theory Selection</b> .....	19
<b>CHAPTER III PROBLEM SOLVING METHODOLOGY</b> .....	23
<b>III.1 Problem Solving Systematics</b> .....	23

<b>III.1.1 Data Collection Stage</b> .....	25
<b>III.1.2 Data Processing Stage</b> .....	26
<b>III.1.4 Stage of Suggestions and Conclusions</b> .....	27
<b>III.2 Identification of Integrated System Components</b> .....	27
<b>III.3 Final Limits and Assumptions</b> .....	28
<b>CHAPTER IV COLLECTION AND PROCESSING OF DATA</b> .....	29
<b>IV.1 Primary Data</b> .....	29
<b>IV.1.1 50kg Gas Cylinder Forming Parts</b> .....	29
<b>IV.1.2 Assembly Welding activities</b> .....	32
<b>IV.2 Secondary Data</b> .....	34
<b>IV.2.1 Company Profile</b> .....	35
<b>IV.2.2 Company Vision</b> .....	35
<b>IV.2.3 Company Mission</b> .....	36
<b>IV.2.4 Organization Structure</b> .....	36
<b>IV.2.5 Risk Assessment Criteria Data</b> .....	36
<b>IV.2.6 ISO 45001:2018 Requirement</b> .....	40
<b>IV.3 Processing Data</b> .....	43
<b>IV.3.1 Hazards Identification Result</b> .....	44
<b>IV.3.2 Risk Assesment Result</b> .....	47
<b>IV.3.3 Risk Control Result</b> .....	54
<b>IV.4 Analysis of the Proposed Control Design with Requirements</b> .....	58
<b>IV.5 Design of Control Proposals</b> .....	59
<b>IV.5.1 Design of Proposed Control of Welding Process Activities</b> .....	60
<b>IV.5.2 Design Proposed Control of Welding Process Position Activities</b> .....	61
<b>IV.5.3 Design Proposed Control of Material Refinement Process Activity</b> ..	63
<b>CHAPTER V ANALYSIS</b> .....	69
<b>V.1 Verification</b> .....	69
<b>V.2 Validation</b> .....	70
<b>V.3 Analysis of Design Proposed</b> .....	73
<b>V.3.1 Analysis of Design Proposed Control of Welding Process Activities</b> ..	73

<b>V.3.2 Analysis of Design Proposed Control of Welding Process Position Activities .....</b>	<b>74</b>
<b>V.3.3 Analysis of Design Proposed Material Refinement Process Activity ..</b>	<b>75</b>
<b>CHAPTER VI CONCLUSION AND SUGGESSTION .....</b>	<b>78</b>
<b>VI.1 Conclusion .....</b>	<b>78</b>
<b>VI.2 Suggestion .....</b>	<b>79</b>
<b>REFERENCES .....</b>	<b>81</b>