

# CONTENTS

<i>List of Tables</i> .....	xv
<i>List of Figures</i> .....	xvii
<i>Items on the CD Accompanying These Guidelines</i> .....	xix
<i>Acronyms and Abbreviations</i> .....	xxi
<i>Glossary</i> .....	xxiii
<i>Acknowledgments</i> .....	xxvii
<i>Preface</i> .....	xxix
<i>Executive Summary</i> .....	xxxi

## 1

### INTRODUCTION

		<b>1</b>
1.1	Historical Perspective	2
1.2	Management of Change Element Overview	3
1.3	Motivations for MOC	5
	1.3.1 Internal Motivations	5
	1.3.2 Industry Initiatives	5
	1.3.3 Regulatory Influences	9
	1.3.4 Quality Initiatives	10
1.4	Commitment Required for Effective MOC Systems	10
1.5	Organization and Use of These Guidelines	11

## 2

### RELATIONSHIP TO RISK-BASED PROCESS SAFETY

2.1	Basic Concepts and Definitions	15
	2.1.1 Process Safety and Risk	15
	2.1.2 Management Systems	16
	2.1.3 Life Cycles of Processes and Management Systems	18
	2.1.4 Responses to Management System Problems	18

2.2	Overview of the RBPS System	19
2.2.1	Risk-based Management System Approach	20
2.2.2	Risk Based Process Safety Elements	21
2.2.3	RBPS System Design Hierarchy	21
2.2.4	Key Principles and Essential Features of MOC Systems	22
2.2.5	Interaction among MOC and Other RBPS Elements	25

### 3

	<b>DESIGNING AN MOC SYSTEM</b>	<b>27</b>
3.1	Establishing Terminology	28
3.2	Determining the Implementation Context	30
3.2.1	Life-cycle Application	30
3.2.2	Considerations for MOC Systems in Non-traditional Activities	31
3.2.3	Establishing MOC System Design Parameters	32
3.2.4	RBPS Design Criteria	33
3.3	Defining Roles and Responsibilities	34
3.4	Defining the Scope of the MOC System	37
3.4.1	Physical Areas for which MOC Will Be Implemented	37
3.4.2	Types of Changes to Be Managed	37
3.4.3	Boundaries and Intentional Overlaps with Other Elements	39
3.5	Integrating with Other PSM Elements and Existing Company Practices and Programs	39
3.6	Requirements for Review and Authorization	42
3.7	Guidelines for Key MOC Issues	42
3.8	Making an MOC System Easier to Monitor	42
3.8.1	Designing an MOC System to Make It Easier to Audit	43
3.8.2	Collecting Performance and Efficiency Measurement Indicator Data	44

### 4

	<b>DEVELOPING AN MOC SYSTEM</b>	<b>45</b>
4.1	Verifying Implementation Context	46
4.2	Identifying Potential Change Situations	47

4.3	Coordinating the MOC System with Existing Procedures	48
4.3.1	Maintenance Work Orders	48
4.3.2	Spare Parts Control, Warehousing, and Distribution	49
4.3.3	Purchase Requisitions and Suppliers	49
4.3.4	Engineering Change Requests	49
4.3.5	Research and Development Recommendations	49
4.3.6	Company Standards and Specifications	50
4.4	Establishing RFC Review and Approval Procedures	50
4.5	Developing Guidelines for Key MOC Issues	52
4.5.1	Evaluating Hazards	52
4.5.2	Communicating Changes or Providing Training	54
4.5.3	Tracking Temporary Changes	54
4.5.4	Integrating MOC with ORRs and PSSRs	55
4.5.5	Allowing Emergency Changes	56
4.6	Designing MOC System Documentation	58
4.7	Defining Employee Training Requirements	58
4.8	Considering How to Modify the MOC System	59
4.9	Comparing the MOC System to the Design Specification	59

# **5**

## **IMPLEMENTING AND OPERATING AN MOC SYSTEM 61**

5.1	Preparing the Site Infrastructure	61
5.2	Managing the Culture Change	62
5.3	Integrating the MOC System with Existing Procedures	63
5.4	Developing a Phased Implementation Plan	63
5.5	Training Personnel Affected by MOC Procedures	64
5.6	Operating an MOC System	65
5.6.1	Monitoring the Operation of the MOC System	65
5.6.2	Resolving MOC Questions and Disputes	66
5.6.3	Maintaining MOC System Documentation and Records	66

# 6

<b>6</b>	<b>MONITORING AND IMPROVING AN MOC SYSTEM</b>	<b>69</b>
6.1	Motivations for Improvement	69
6.2	Sources of Information to Launch and Guide Improvement	71
6.2.1	Performing MOC Audits	72
6.2.2	Collecting Metrics and Performing Management Reviews	73
6.3	Identifying the Need to Improve	74
6.3.1	Identifying Specific Problem Areas for Corrective Action/Redesign	74
6.3.2	Using Performance and Efficiency Metrics	75
6.3.3	Performing Management Reviews	76
6.4	Identifying Opportunities for Corrective Action or Improvement	77
6.4.1	Identifying and Addressing Causal Factors	77
6.4.2	Identifying Typical Causes of Ineffective MOC Systems	78
6.4.3	Performing a Gap Analysis for Performance Issues	88
6.5	Implementing the Redesign/Improvement Effort	88
6.5.1	Managing the Redesign Effort	89
6.5.2	Itemizing and Evaluating Known Concerns	90
6.5.3	Proposing Corrective Actions to Address the Causal Factors	90
6.5.4	Repeating the Evaluation to Address Efficiency Issues	91
6.5.5	Challenging the Proposed Revisions to the MOC System	91
6.5.6	Implementing and Monitoring the Redesigned or Improved MOC System	91

<b>7</b>	<b>THE FUTURE OF CHANGE MANAGEMENT</b>	<b>93</b>
<b>APPENDIX A:</b>	<b>EXAMPLES OF REPLACEMENTS-IN-KIND AND CHANGES FOR VARIOUS CLASSES OF CHANGE</b>	<b>97</b>
<b>APPENDIX B:</b>	<b>MOC SYSTEM DESIGN STRUCTURE</b>	<b>117</b>
<b>APPENDIX C:</b>	<b>EXAMPLES OF MOC SYSTEM PROCEDURE WORK FLOW CHARTS AND MOC REVIEW DOCUMENTATION FORMS</b>	<b>123</b>
<b>APPENDIX D:</b>	<b>ELECTRONIC MOC APPLICATIONS</b>	<b>133</b>
<b>APPENDIX E:</b>	<b>EXAMPLE MOC SYSTEM AUDIT CHECKLIST</b>	<b>147</b>
<b>APPENDIX F:</b>	<b>EXAMPLE MOC PERFORMANCE AND EFFICIENCY METRICS</b>	<b>153</b>
<b>APPENDIX G:</b>	<b>COMMON MOC PROBLEMS AND PROPOSED SOLUTIONS</b>	<b>155</b>
	<b>REFERENCES</b>	<b>165</b>
	<b>INDEX</b>	<b>167</b>