CONTENTS

List of Figures ........................................................................................................... ix
List of Tables ............................................................................................................ xiii
Acronyms and Abbreviations .................................................................................... xv
Glossary .................................................................................................................... xvii
Acknowledgments ................................................................................................... xviii
Preface .................................................................................................................... xxv

1 INTRODUCTION ................................................................. 1
  1.1 The Need for Integration .......................................................... 1
  1.2 The Purpose of this Guideline ................................................. 4
  1.3 The Scope of this Guideline .................................................... 4
  1.4 The Approach used in this Guideline ...................................... 4
  1.5 How Established Models can be used in Integrated Systems ..... 8
  1.6 Exclusions to the Scope .......................................................... 9
  1.7 Key Audience for this Guideline ............................................. 9
  1.8 Some Recent Advances in Process Safety Metrics ................. 10

2 SECURE LEADERSHIP SUPPORT ACROSS GROUPS .......... 11
  2.1 The Need for Securing Support .............................................. 11
  2.2 Securing Support to Optimize Resource Allocation ............... 14
  2.3 Developing a Preliminary Plan .............................................. 16
  2.4 The Importance of a Safety Culture ..................................... 23
  2.5 Identifying Stakeholders ...................................................... 24
  2.6 Sharing Resources across Groups ....................................... 27
  2.7 The Case for a SHEQ&S program ....................................... 27
  2.8 Surveying for Competency Gaps ......................................... 28
3 EVALUATE HAZARDS AND RISKS ACROSS GROUPS 31
3.1 The Need for Evaluating Hazards and Risks 31
3.2 Identifying and Prioritizing Key Processes and Risks 32
3.3 Selecting Potential Metrics 33
3.4 Focusing on Process Safety Performance 35
3.5 Re-evaluating Metrics for Continuous Improvement 35
3.6 Examples of Performance Effects across SHEQ&S Groups 38

4 IDENTIFY COMMON METRICS ACROSS GROUPS 41
4.1 The Need for Identifying Common Metrics 41
4.2 Define the System Integration Process 43
4.3 Identify the Program Requirements 43
4.4 Develop the Program 43
4.5 Identify Overlapping Metrics 46
4.6 Prioritize the Program Installation 66
4.7 Document the Program Baseline 72
4.8 Continuous Improvements 73
4.9 Some Management System Assessment Tools 73
4.10 Other Metrics Worth Considering 82

5 IMPLEMENT THE SHEQ&S PROGRAM 83
5.1 The Need for Proper Implementation 86
5.2 How to Apply the Plan, Do, Check, Act (PDCA) Approach 86
5.3 Piloting the SHEQ&S program 95
5.4 Communication 103

6 MONITOR THE SHEQ&S PROGRAM PERFORMANCE 105
6.1 The Need for Reviewing and Assessing Program Performance 106
6.2 How to Reinforce the Integrated Framework 108
6.3 How to Use Management Reviews to Respond to Gaps 108
6.4 How to Engage Leadership 109
6.5 The Roadmap and Process Improvement Plan 110
6.6 Auditing and Verifying the Program 110
6.7 Tracking Corrective Actions 111
6.8 Statistical Methods and Tools 112
6.9 Capturing Early Success 114
CONTENTS

6.10 Improving Performance in All SHEQ&S Management Systems... 115
6.11 How and When to Communicate the Information... 115
6.12 Obtaining Stakeholder Feedback... 118
6.13 Metric Communication Examples... 119

7 IMPLEMENT CHANGES TO THE SHEQ&S PROGRAM... 121
7.1 The Need for Continuous Improvement... 122
7.2 Ensuring Management Responsibility... 122
7.3 Addressing Non-Conformities... 122
7.4 Using Statistical Methods... 126

8 EXAMPLES FROM INDUSTRY... 127
8.1 Case Studies... 129
8.2 Examples of the SHEQ&S program... 129

APPENDIX A: REFERENCE LISTS FOR GLOBAL PROCESS SAFETY LEGISLATION AND SHEQ&S ORGANIZATIONS... 131

APPENDIX B: RECENT ADVANCES IN PROCESS SAFETY METRICS... 139

APPENDIX C: POTENTIAL ANSWERS DESCRIBING THE NEED FOR SECURING SUPPORT... 145

APPENDIX D: DETAILED CASE STUDY FOR DESIGNING AND IMPLEMENTING A SHEQ&S PROGRAM... 147

APPENDIX E: EQUIPMENT INTEGRITY IN THE EQUIPMENT LIFE CYCLE... 158

APPENDIX F: THE SHEQ&S MANAGEMENT SYSTEM MAPPING SURVEY... 160

APPENDIX G: THE PROCESS SAFETY PERSONNEL COMPETENCY SURVEY... 167

REFERENCES... 179
INDEX... 185