

Contents

Contents	iv
Preface	ix
Acknowledgements.....	x
Abbreviations / Acronyms used in this Guide.....	xi
1 Scope	1
1.1 What is included?.....	1
1.2 What is not included?.....	1
1.3 Reference publications for above-ground rectangular metallic tanks.....	2
1.4 Terminology.....	3
2 Tank Procurement	4
2.1 General.....	4
2.2 Selecting a tank provider.....	4
2.3 Requirements for discussion/information to be exchanged between the end user and tank provider.....	4
3 Electrical Requirements	12
3.1 General.....	12
3.2 Ingress protection.....	12
4 Considerations for Tank and Equipment Location	13
4.1 Environmental consideration.....	13
4.2 Area classification (Hazardous Zoning)	13
4.3 Separation distances.....	13
5 Tank support consideration.....	14
5.1 General.....	14
5.2 Access for inspection and maintenance.....	14
5.3 Design considerations.....	14
6 Delivery, installation and commissioning	15
6.1 Delivery and installation.....	15
6.2 Commissioning	15

7 Operational requirements	16
7.1 General.....	16
7.2 Operating instructions	16
7.3 Authorised personnel.....	16
7.4 Operational permits	15
8 Maintenance Requirements	17
8.1 The purpose of maintenance.....	17
8.2 Maintenance programme.....	17
9 Degradation mechanisms and failure modes	18
9.1 General.....	18
9.2 Failure modes.....	18
9.3 Corrosion	18
9.4 Other Weathering.....	19
9.5 Mechanical degradation.....	19
9.6 Buckling.....	19
9.7 Structural degradation.....	19
9.8 Chemical degradation.....	19
9.9 Contamination	19
9.10 Thermal degradation.....	20
10 Inspection Requirements.....	21
10.1 General.....	21
10.2 The purpose of inspections.....	21
10.3 Safety and preliminary considerations for inspections	21
10.4 Inspector competence.....	22
10.5 Type and frequency of inspection	22
10.5.1 Commissioning inspection	22
10.5.2 Periodic inspections.....	23
10.5.3 Periodic visual inspection (6 Monthly to Annual).....	24
10.5.4 Periodic in-service inspection (Five Year).....	24
10.5.5 Periodic thorough inspection (Ten Year)	24
10.5.6 Inspection after exceptional circumstances.....	24
10.5.7 Inspection reporting	25
10.5.8 Competence requirement.....	25
10.5.8.1 Commissioning inspection.....	25
10.5.8.2 Periodic visual inspection (6 Monthly to Annual).....	24
10.5.8.3 Periodic in-service inspection (Five Year).....	26
10.5.8.4 Periodic thorough inspection (Ten Year).....	26

11 Life Cycle Considerations	27
11.1 Introduction	27
11.2 Repurposing, relocating or transfer of tanks	27
11.3 Out of service or mothballed tanks	28
11.4 Repairs and modifications	28
11.5 Recommissioning following repair or modification	28
11.6 Deciding end-of-life	29
11.7 Decommissioning and disposal	29
12 Management of Change	30
Appendix A –Typical arrangements	31
Appendix B – Examples	32
Appendix C – Tank capacity and fill levels	38
Appendix D – Nameplates.....	39
D.1 Preferred format	39
D.2 Example nameplates.....	39
Appendix E – Commissioning checklist - Example	41
Appendix F – Example management of change form and assessment checklist	44
F.1 General.....	44
F.2 Management of change form	45
F.3 Assessment checklist	46
Appendix G – Example inspection record forms	50
G.1 Checklist 1 – 6 to 12 Month – Visual inspection.....	51
G.2 Checklist 2 – 60 Month (5-Year) – In-service inspection.....	52
G.3 Checklist 3 – 120 Month (10-Year) – Thorough inspection.....	57
Appendix H – Ultrasonic thickness measurements.....	59
Bibliography.....	60
EEMUA can offer you a lot more than publications.....	62
EEMUA Publication: feedback form.....	63
EEMUA Online Learning Courses	64
EEMUA Publications Catalogue	66

List of Figures

Figure A-1 Current tank type	31
Figure A-2 Inner tank and cabinet.....	31
Figure B-1 Typical newer self-bunded tank with integral dispensing cabinet.....	32
Figure B-2 Typical 'older' tank installation – open steel bund.....	32
Figure B-3 A further example of an older installation with an open bund.....	33
Figure B-4 An example of a poor installation.....	33
Figure B-5 Older Tank – Before Inspection and Repainting	34
Figure B-6 Older tank – After Inspection and Repainting	34
Figure B-7 Examples of Tank Corrosion	35
Figure B-8 Examples of Paint deterioration.....	35
Figure B-9 Water collecting in open bund.....	35
Figure B -10 Paint break down and corrosion on inaccessible surfaces (between open bund and tank wall).....	36
Figure B-11 Tank support runner corrosion	36
Figure B-12 Corrosion of lower surface and trapped debris.....	36
Figure B-13 Unplugged drain valve.....	36
Figure B-14 Leaking Piping Joint.....	36
Figure B-15 Inspection Challenges – External, lower surfaces	37
Figure B-16 Inspection challenges, internal, all areas	37
Figure C-1 Tank levels and alarm settings.....	38
Figure D-1 Typical nameplate	39
Figure D-2 Non-typical nameplate (Example 1)	40
Figure D-3 Non-typical nameplate (Example 2)	40

List of Tables

Table 2-1 Product Details.....	5
Table 2-2 Design Considerations.....	6
Table 2-3 Fabrication and Quality Control	9
Table 2-4 Surface Treatment.....	10
Table 2-5 Documentation	10
Table 2-6 Delivery, Installation and Commissioning	11
Table 10-1 Grades of periodic inspection.....	23
Table 10-2 Typical inspection schedule.....	23