Contents

C	onter	nts	V					
Fi	gure	es & Tables	VIII					
Sc	ope		1					
	Exclusions from Scope							
Ρι	ırpos	se of this Publication	3					
Revision from the second edition								
D		tions						
A	•	yms/Abbreviations						
1	Intr	roduction	8					
2	Rea	9						
	2.1	Manufacturers' Pressure Test	9					
	2.2							
	2.3	In-service Pressure Test	10					
		2.3.1 Statutory Requirement	10					
		2.3.2 Integrity Management						
		2.3.3 Repairs and Rerating						
	2.4	Review	12					
3	Types of Pressure Test							
	3.1	3.1 Standard Pressure Test						
	3.2	3.2 Tightness Test						
	3.3							
	3.4	Preliminary Pneumatic Test	15					
	3.5	Sensitive Leak Test	15					
	3.6	Acceptance Criteria	15					
	3.7	Functional Test	15					
	3.8	Test Medium	15					
	3.9	Test Type Selection	16					
4	Haz	zards of Pressure Testing	18					
	4.1	Stored Energy Comparisons						
		4.1.1 Hydrostatic Testing	20					

		4.1.2 P	Pneumatic Testing	20			
		4.1.3 S	Stored Energy	20			
	4.2	Effects o	f Stored Energy Release – Exclusion Zones	21			
		4.2.1 B	Blast and Pressure Waves	21			
		4.2.2 F	ragmentation and Missiles	22			
		4.2.3 A	Avoiding Brittle Fracture	22			
		4.2.4 J	ets and Impingement	23			
		4.2.5 F	Review	23			
5	Test	t Operativ	res Competence and Training	25			
	5.1	Framewo	ork	25			
	5.2						
	5.3	Duties ar	27				
		5.3.1 li	nteractions	29			
	5.4	Compete	ence Requirements for PTs	29			
		5.4.1	Demonstration of Competence for PTs	30			
	5.5	Knowled	lge and Understanding	30			
	5.6	Fundam	ental Topics for Pressure Testing Competency	31			
		5.6.1 F	undamental Topics	31			
			raining Curriculum				
	5.7		tion				
		5.7.1 F	Responsible Person	34			
			Assessment of Competence				
			Ongoing Assessment				
		5.7.4 F	Records and Output	35			
6	Spe	pecial Cases3					
	6.1	Waiving	a Pressure Test	36			
	6.2	Compon	nents and Assemblies	36			
		6.2.1 F	langes, Bolting and Sealing	36			
		6.2.2 S	Specific Components	36			
		6.2.3	Component Integrity	37			
			Component Pressure Boundary				
	6.3		Welds				
	6.4	Reduced	Pressure Tests (additional NDT)	37			
	6.5	Localised	d Pressure Testing	38			
7	Unc	39					
	7.1	What Ca	n Put People and Equipment at Risk During Tests?	39			
	7.2						
	7.3	3 Policy					
	7⊿	Planning	1	42			

		7.4.1	Calculations	43				
		7.4.2	Test Fluid	44				
		7.4.3	Support Structures, Pipe Hangers, etc	44				
		7.4.4	Restraints and Tethers	45				
		7.4.5	Test Rig	45				
		7.4.6	Pressure Gauges	46				
		7.4.7	Procedure	46				
		7.4.8	Intrusive Inspection	48				
		7.4.9	Weather	48				
	7.5 Preparation							
		7.5.1	Communications					
		7.5.2	Mechanical Condition Sign-off					
		7.5.3	Check and Double Check the Test Set-up					
		7.5.4	Risk Assessment					
	7.6	Execu	tion					
		7.6.1	Filling					
		7.6.2	Testing					
	7.7	Comp	letion	52				
8	Spe	cial Pre	ecautions	54				
8.1 Fired Heaters			Heaters	54				
	8.2	Storag	ge Tanks	54				
	8.3	Heat E	Exchangers	54				
	8.4	Pump	Casings, Valves and Other Items	54				
	8.5	Transr	mission Pipelines	55				
9	Bibl	iograp	hy	56				
		-						
Αp	pen	dix A C	omparison of NDT Techniques	59				
Αŗ	pen	dix B C	omparison of Terms	61				
Αŗ	pen	dix C Te	est Fluids: Comments and User Experience	62				
Αŗ	pen	dix D L	essons Learned	65				
Αŗ	pen	dix E Ex	cample of Depth of Knowledge in Fundamentals	69				
Fi	gures	s & Tab	les					
		Figure 1 – Pressure test type considerations for new pressure equipment						
	_		ressure test type considerations for pressure equipment that is in service					
	Figure 3 – Legislation, guidance and practices associated with pressure testing							
			Developing Industry Specific PT Qualifications					
	_		Steps in safe pressure testing					
	_							

Figure 6 – Typical breakdown of policy elements for safe pressure testing	41
Figure 7 – Typical considerations for planning safe pressure testing	43
Figure 8 – Typical Standard Pressure Test Procedure – MAWP 500psig, Pneumatic T	
Pressure 550psig	47
Figure 9 – Typical steps in preparing for safe pressure testing testing	49
Figure 10 – Final check on actions for safe pressure testing	51
Figure 11 – Completion of safe pressure testing	52
Figure 12 – Considerations for safe pressure testing	53
Figure 13 – Pressure Test Arrangements for Shell and Tube Heat Exchangers	55
Table 1 – Terminology used in this publication	5
Table 2 – Vessel and pressure test details for stored energy comparisons	19
Table 3 – Listing of the Three Levels of Competence for PTs	27
Table 4 – Listing of the Typical Duties and Responsibilities of PTs	28
Table 5 – Minimum Competence Requirements for PTs	30
Table 6 – PTC1 Operating Environment Fundamentals	31-32
Table 7 – PTC2 Organisational Arrangements Fundamentals	32
Table 8 – PTC3 Plant and Equipment Fundamentals	32-33
Table 9 – PTC4 Continuous Improvement Fundamentals	33
Table 10 – Examples of issues that can contribute to unsafe pressure testing	39
Table 11 – Comparison of inspection techniques	59-60
Table 12 – Comparison of terms used for pressure testing in various	
standards and guidances	61
Table 13 – Examples of incidents during pressure testing and	
lessons that can be learned	65-68
Table 14 – PTC1 Operating Environment Fundamentals	69-70
Table 15 – PTC2 Organisation Arrangements Fundamentals	70
Table 16 – PTC3 Plant and Equipment Fundamentals	71
Table 17 – PTC4 Continuous Improvement Fundamentals	72
EEMUA Publications: Feedback Form	73
FEMILA Publications Catalogue	74

EEMUA Policy is to evaluate new publications for their contribution to sustainability. Equipment may be pressure tested at various stages of its life cycle to provide some degree of assurance of equipment integrity and avoid unnecessary leakage of inventory (which may include greenhouse gasses), equipment renewal and associated wastage of resources and energy.