

Contents

Abbreviations/Acronyms.....	vii
1. Introduction and Objectives.....	1
1.1 Scope	1
1.2 Objectives	2
2. Use of this EEMUA Publication	3
2.1 Recommended Use of this EEMUA Publication	3
2.2 List of Definitions	3
3. Structured Approach to Competence Management.....	5
3.1 Evaluations of Inspection Personnel	5
3.1.1 The Competence Management System Cycle	5
3.1.2 CMS Phases and Principles.....	6
3.1.3 Developing and Maintaining the Competence of Individuals	7
3.2 Relevant Qualifications	8
3.3 RG0 Illustrated Process.....	10
4. Identify the Range of Inspection Activities	11
5. Identify the Competence Required for Each Activity	13
5.1 Personal Attributes of Inspection Personnel	13
5.1.1 Communication Skills.....	13
5.1.2 Physical Capability.....	13
5.1.3 Acuity of Senses	13
5.1.4 Ability to Work Alone	14
5.1.5 Ability to Deal with Challenging Clients	14
5.1.6 Writing Skills	15
5.1.7 Academic and Practical Training	15
5.1.8 Inspection Reports and Repair Recommendations	15
5.2 Technical Competencies.....	15
5.2.1 Detection of Defects	15
5.2.2 Use of Instruments.....	16
5.2.3 Evaluation of Defects	16
5.2.4 Decision Making	21
5.2.5 Inspection Scheme Development, Interpretation and Review	29
5.2.6 Underpinning Knowledge and Understanding	31
5.2.7 Mechanics of Materials	35
5.2.8 Risk Assessment	39
5.2.9 Failure Mode and Criticality Analysis.....	39
5.2.10 Limits of their Own Understanding and Capability	40
6. Train and Assess Against the Competence Criteria.....	41
6.1 Employ Persons Competent to Undertake Inspection Tasks	41
6.2 Ensure Inspection Personnel have the Necessary Personal Attributes, Knowledge, Training and Education	41
6.3 Assess Competence and Ensure Competence of Assessors	41
6.3.1 Certification.....	41
6.3.2 Training Records	42
6.3.3 Performance Appraisal Records	42
6.3.4 Observation/Demonstration	42
6.3.5 Direct Questioning.....	43
7. Authorise Persons for Activities Under Appropriate Supervision	45
8. Monitor Performance of Persons to Re-assess Competence	47
Appendix A - Typical Job Titles and Roles.....	49
A1 (Technical) Management.....	49
A2 (Technical) Supervision	49
A3 Inspector for Major Systems.....	50

A4 Support Staff	50
A4.1 Plant Inspector (PI) or Inspector (I).....	50
A4.2 Piping Inspectors and Relief Stream Inspectors	50
A4.3 Welding Inspectors.....	51
A4.4 NDT Technicians	51
Appendix B - Certification Schemes.....	53
B1 UK.....	53
B1.1 Scope.....	53
B1.2 Personnel.....	53
B1.3 Training	53
B1.4 Inspection Methods and Procedures	54
B1.5 Subcontracting	54
B2 EU.....	54
B3 USA.....	54
Appendix C - Examples from RG0	55
C1 Example of Type B Inspection Body	55
C1.1 Identification of Competencies	55
C1.2 Train and Assess Staff Against Required Competencies	55
C1.3 Authorisation.....	56
C1.4 Monitor Performance and Re-assess Competence.....	56
C2 Example of Inspection in a Major Hazard Environment	56
C2.1 Identification of Competencies	56
C2.2 Train and Assess Staff Against the Required Competencies.....	57
C2.3 Assessment.....	57
C2.4 Authorisation.....	57
C2.5 Monitor Performance and Reassess Competence	57
Appendix D - Country Specific Legislation	59
D1 Pressure System and Safety legislation.....	59
D1.1 Client Safety Training Requirements	60
D1.2 The Pressure Systems Safety Regulations (PSSR) 2000	60
Appendix E - Life Expectancy Data	63
References and Bibliography.....	65
References	65
Standards and Recommended Practices.....	67
Bibliography	69

Figures

Figure 1 Schematic representation of the Phases of the CMS cycle	5
Figure 2 Proposed system for developing/maintaining staff competence	7
Figure 3 Diagrammatic representation of competence assessment.....	10

Tables

Table 1 Criteria for Inspection Personnel Qualifications.....	8
Table 2 Examples of Inspectors Qualification Criteria	9
Table 3 Example of FMECA Process	40
Table 4 UK and EU Pressure System Legislation.....	59
Table 5 Pressure equipment covered/not covered by the PSSR	61
Table 6 Life expectancy for plastics.....	63