

CONTENTS

1.	INTRODUCTION	1
1.1.	Objective	1
1.2.	Scope	1
1.3.	Relevant IAEA publications	2
1.4.	Terminology	2
2.	THE PURPOSES OF TESTING	2
2.1.	Employee selection and job placement	3
2.2.	Trainee assessment	3
2.3.	Qualification, requalification and authorization	4
2.4.	Job advancement/promotion	4
2.5.	Other purposes and uses of testing	4
2.5.1.	Trainee motivation	4
2.5.2.	Instructional improvement	5
2.5.3.	Programme evaluation	5
2.5.4.	An instrument to provide teaching and feedback	5
3.	BASIS FOR EXAMINATIONS	6
3.1.	Job/task analysis and job competency analysis	6
3.2.	Training objectives	6
3.3.	Classification of training objectives	7
3.4.	Selection and overview of assessment methods	8
3.5.	Supporting material	9
4.	WRITTEN EXAMINATIONS	11
4.1.	General discussion	11
4.2.	Development of written test items	17
4.3.	Formats of test items	19
4.3.1.	Short answer test items	19
4.3.2.	Multiple-choice test items	22
4.3.3.	Essay format test items	29
4.4.	Open reference testing	33
4.5.	Test item answers and point value	35
4.5.1.	Cognitive level versus point value	36

4.5.2.	Scoring essay format test items	37
4.6.	Examination specifications	37
4.6.1.	Developing examination specifications	38
4.6.2.	Examination construction	39
4.6.3.	Examination layout and assembly	40
4.7.	Examination banks	41
4.7.1.	Trainee access to examination banks	42
4.8.	Written examination administration	43
4.8.1.	Establish environment	43
4.8.2.	Test directions	43
4.8.3.	Test monitoring	44
4.8.4.	Use of handouts	44
5.	ORAL EXAMINATIONS	45
5.1.	Benefits of oral assessment	46
5.2.	Types and uses of oral examinations	46
5.2.1.	One-on-one oral checkout	46
5.2.2.	Oral (or examination) board	47
5.2.3.	Other uses of oral boards	47
5.3.	General guidance for oral assessments	49
5.3.1.	Procedures for oral examination	49
5.3.2.	Examination intent	49
5.4.	Development of oral questions	50
5.4.1.	Types of question	51
5.4.2.	Questioning process	51
5.5.	Administration of oral checkouts	52
5.5.1.	Assessor actions at completion of an oral checkout ...	53
5.6.	Adminstration of oral boards	53
5.6.1.	Oral board preparation	53
5.6.2.	Participation on oral boards	54
5.6.3.	Oral board facilities	55
5.6.4.	Conduct of oral boards	56
5.6.5.	Oral board grading	57
6.	PERFORMANCE ASSESSMENTS	57
6.1.	Developing performance assessments	58
6.1.1.	Determine test limitations	59
6.1.2.	Determine elements to be tested	60
6.1.3.	Determine conditions and standards	61

6.1.4.	Determine method of accomplishment	62
6.1.5.	Construct the performance test	63
6.1.6.	Develop scoring procedures	64
6.1.7.	Piloting the performance test	65
6.2.	Performance test administration	65
6.2.1.	Establish environment	65
6.2.2.	Test directions	66
6.2.3.	Conducting the performance test	66
6.2.4.	Assessing the performance test	67
6.2.5.	Debriefing the trainee	67
6.3.	Other types of performance assessment	67
6.3.1.	Assessment centres	67
6.3.2.	Performance assessments of professional-technical staff	68
6.3.3.	Simulator assessments	68
7.	COMPUTER BASED EXAMINATIONS	68
8.	EXAMINATION METHODS TO IMPROVE THE EFFICIENCY AND EFFECTIVENESS OF TRAINING	70
8.1.	Some Member State approaches	70
8.1.1.	Sharing of training and examination materials	70
8.1.2.	Sharing of examination banks	71
8.1.3.	Industry-wide examination process	71
8.1.4.	Reciprocity agreements	71
8.1.5.	Nuclear training groups	71
9.	RELIABILITY AND VALIDITY	72
9.1.	Reliability	72
9.2.	Validity	74
9.2.1.	Content validity	75
9.2.2.	Concurrent validity	75
9.2.3.	Construct validity	75
9.2.4.	Predictive validity	76
9.3.	Methods to improve validity	76
10.	EXAMINATION AND TEST ITEM ANALYSIS	77
10.1.	Examinations	77
10.2.	Test item analysis	79

APPENDIX I:	DEFINITION OF TERMS	81
APPENDIX II:	ACTION VERBS	88
APPENDIX III:	TEST ITEM DEVELOPMENT FORM	91
APPENDIX IV:	WRITTEN TEST ITEM REVIEW CHECKLIST...	92
APPENDIX V:	EXAMPLES OF MULTIPLE-CHOICE TEST ITEMS	97
APPENDIX VI:	EXAMPLE DIRECTIONS TO TRAINEES FOR A WRITTEN EXAMINATION.....	104
APPENDIX VII:	EXAMPLE FIELD CHECKLIST FOR A MAINTENANCE TASK	106
APPENDIX VIII:	EXAMPLE WORKPLACE ASSESSMENT	110
APPENDIX IX:	EXAMPLE ORAL BOARD INSTRUCTIONS ...	116
APPENDIX X:	METHOD FOR ORAL BOARD GRADING	118
APPENDIX XI:	PERFORMANCE TEST CONSTRUCTION CHECKLIST	122
APPENDIX XII:	EXAMPLE PERFORMANCE TEST FOR A MAINTENANCE INSPECTION TASK.....	124
APPENDIX XIII:	EXAMPLE PERFORMANCE TEST FOR A SYSTEMS ENGINEER	129
APPENDIX XIV:	EXAMPLE INSTRUCTOR OBSERVATION FORM	135
APPENDIX XV:	SELF-ASSESSMENT OF INSTRUCTOR QUALITIES	140
REFERENCES	143
BIBLIOGRAPHY	144

CONTENTS OF THE ACCOMPANYING CD-ROM 145

CONTRIBUTORS TO DRAFTING AND REVIEW 149