ASME NQA-1–2022

(Revision of ASME NQA-1–2019)

Quality Assurance Requirements for Nuclear Facility Applications

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers

ASME NQA-1–2022
(Revision of ASME NQA-1–2019)

Quality Assurance Requirements for Nuclear Facility Applications

AN AMERICAN NATIONAL STANDARD

The American Society of Mechanical Engineers
Two Park Avenue • New York, NY • 10016 USA

Date of Issuance: June 30, 2022

The next edition of this Standard is scheduled for publication in 2024.

ASME issues written replies to inquiries concerning interpretations of technical aspects of this Standard. Interpretations are published on the ASME website under the Committee Pages at http://cstools.asme.org/ as they are issued.

Errata to codes and standards may be posted on the ASME website under the Committee Pages to provide corrections to incorrectly published items, or to correct typographical or grammatical errors in codes and standards. Such errata shall be used on the date posted.

The NQA Committee Page can be found at https://go.asme.org/NQAcommittee. There is an option available to automatically receive an e-mail notification when errata are posted to a particular code or standard. This option can be found on the appropriate Committee Page after selecting “Errata” in the “Publication Information” section.

ASME is the registered trademark of The American Society of Mechanical Engineers.

This code or standard was developed under procedures accredited as meeting the criteria for American National Standards. The standards committee that approved the code or standard was balanced to ensure that individuals from competent and concerned interests had an opportunity to participate. The proposed code or standard was made available for public review and comment, which provided an opportunity for additional public input from industry, academia, regulatory agencies, and the public-at-large.

ASME does not “approve,” “rate,” or “endorse” any item, construction, proprietary device, or activity. ASME does not take any position with respect to the validity of any patent rights asserted in connection with any items mentioned in this document, and does not undertake to insure anyone utilizing a standard against liability for infringement of any applicable letters patent, nor does ASME assume any such liability. Users of a code or standard are expressly advised that determination of the validity of any such patent rights, and the risk of infringement of such rights, is entirely their own responsibility.

Participation by federal agency representatives or persons affiliated with industry is not to be interpreted as government or industry endorsement of this code or standard.

ASME accepts responsibility for only those interpretations of this document issued in accordance with the established ASME procedures and policies, which precludes the issuance of interpretations by individuals.

No part of this document may be reproduced in any form,
in an electronic retrieval system or otherwise,
without the prior written permission of the publisher.

The American Society of Mechanical Engineers
Two Park Avenue, New York, NY 10016-5990

Copyright © 2022 by
THE AMERICAN SOCIETY OF MECHANICAL ENGINEERS
All rights reserved
Printed in U.S.A.

CONTENTS

Foreword		xviii
Correspondence With the NQA Committee		xxiv
Committee Roster		xx
Introduction		xxvi
Summary of Changes		xxvii
Part I	**Requirements for Quality Assurance Programs for Nuclear Facilities (From Former ASME NQA-1)**	1
	Introduction	1
100	Purpose	1
200	Applicability	1
300	Responsibility	1
400	Terms and Definitions	1
Requirement 1	**Organization**	5
100	General	5
200	Structure and Responsibility	5
300	Interface Control	5
Requirement 2	**Quality Assurance Program**	6
100	General	6
200	Indoctrination and Training	6
300	Qualification Requirements	6
400	Records of Qualification	8
500	Records	8
Requirement 3	**Design Control**	9
100	General	9
200	Design Input	9
300	Design Process	9
400	Design Analyses	9
500	Design Verification	10
600	Change Control	10
700	Interface Control	11
800	Software Design Control	11
900	Documentation and Records	11
Requirement 4	**Procurement Document Control**	12
100	General	12
200	Content of the Procurement Documents	12
300	Procurement Document Review	12
400	Procurement Document Changes	12
Requirement 5	**Instructions, Procedures, and Drawings**	13

100	General	13
Requirement 6	**Document Control**	14
100	General	14
200	Document Control	14
300	Document Changes	14
Requirement 7	**Control of Purchased Items and Services**	15
100	General	15
200	Supplier Evaluation and Selection	15
300	Bid Evaluation	15
400	Control of Supplier-Generated Documents	15
500	Acceptance of Item or Service	15
600	Control of Supplier Nonconformances	16
700	Commercial Grade Items and Services	16
800	Records	17
Requirement 8	**Identification and Control of Items**	18
100	General	18
200	Identification Methods	18
300	Specific Requirements	18
Requirement 9	**Control of Special Processes**	19
100	General	19
200	Process Control	19
300	Responsibility	19
400	Records	19
Requirement 10	**Inspection**	20
100	General	20
200	Inspection Requirements	20
300	Inspection Hold Points	20
400	Inspection Planning	20
500	In-Process Inspection	20
600	Final Inspections	20
700	Inspections During Operations	20
800	Records	20
Requirement 11	**Test Control**	22
100	General	22
200	Test Requirements	22
300	Test Procedures (Other Than for Computer Programs)	22
400	Computer Program Test Procedures	22
500	Test Results	22
600	Test Records	22
Requirement 12	**Control of Measuring and Test Equipment**	24
100	General	24
200	Selection	24
300	Calibration and Control	24
400	Records	24
Requirement 13	**Handling, Storage, and Shipping**	26

100	General	26
200	Special Requirements	26
300	Procedures	26
400	Tools and Equipment	26
500	Operators	26
600	Marking or Labeling	26
Requirement 14	**Inspection, Test, and Operating Status**	27
100	General	27
200	Authority	27
300	Status Indication	27
Requirement 15	**Control of Nonconforming Items**	28
100	General	28
200	Identification	28
300	Segregation	28
400	Disposition	28
Requirement 16	**Corrective Action**	29
100	General	29
Requirement 17	**Quality Assurance Records**	30
100	General	30
200	Generation of Records	30
300	Authentication of Records	30
400	Classification	30
500	Receipt Control of Records	30
600	Storage	30
700	Retention	31
800	Maintenance of Records	31
Requirement 18	**Audits**	32
100	General	32
200	Scheduling	32
300	Preparation	32
400	Performance	33
500	Reporting	33
600	Response	33
700	Follow-Up Action	33
800	Records	33
Part II	**Quality Assurance Requirements for Nuclear Facility Applications**	34
	Introduction	34
100	Purpose	34
200	Applicability	34
300	Responsibility	34
400	Planning and Procedures	34
500	Definitions	35
600	Multiunit Facility Provisions	35
Subpart 2.1	**Quality Assurance Requirements for Cleaning of Fluid Systems and Associated Components for Nuclear Facilities**	36

100	General	36
200	General Requirements	37
300	Cleanness Criteria	38
400	Manufacturing Phase Cleanness	42
500	Cleanness Prior to Installation	42
600	Cleanness During Installation	42
700	Maintenance of Installation Cleanness	43
800	Preoperational Cleaning	43
900	Layup and Postlayup Cleaning	44
1000	Postoperational Repairs and Modifications	44
1100	Records	45
Subpart 2.2	**Quality Assurance Requirements for Packaging, Shipping, Receiving, Storage, and Handling of Items for Nuclear Facilities**	46
100	General	46
200	General Requirements	46
300	Packaging	47
400	Shipping	53
500	Receiving	54
600	Storage	55
700	Handling	57
800	Records	57
Subpart 2.3	**Quality Assurance Requirements for Housekeeping at Nuclear Facilities**	58
100	General	58
200	General Requirements	58
300	Requirements	58
400	Records	60
Subpart 2.5	**Quality Assurance Requirements for Installation, Inspection, and Testing of Structural Concrete, Structural Steel, Soils, and Foundations for Nuclear Facilities**	61
100	General	61
200	General Requirements	62
300	Requirements	62
400	Preconstruction Verification	62
500	Inspection of Soils and Earthwork	63
600	Inspection of Foundation Pile and Caisson Construction	64
700	Inspection of Concrete Construction	66
800	Inspection of Steel Construction	69
900	Data Analysis and Evaluation	70
1000	Records	71
Subpart 2.7	**Quality Assurance Requirements for Computer Software for Nuclear Facility Applications**	72
100	General	72
200	General Requirements	73
300	Software Acquisition	75
400	Software Engineering Method	75

500	Standards, Conventions, and Other Work Practices	77
600	Support Software	78
700	Reference	78
Subpart 2.8	**Quality Assurance Requirements for Installation, Inspection, and Testing of Mechanical Items for Nuclear Facilities**	79
100	General	79
200	General Requirements	79
300	Preinstallation Verification	80
400	Installation Inspections	81
500	Systems Turnover Inspection and Tests	82
600	Data Analysis and Evaluation	84
700	Records	84
Subpart 2.14	**Quality Assurance Requirements for Commercial Grade Items and Services**	85
100	General	85
200	CGI Definition Applications	86
300	Utilization	86
400	Technical Evaluation	86
500	Critical Characteristics	87
600	Methods of Accepting Commercial Grade Items and Services	87
700	Commercial Grade Services	90
800	Documentation	90
900	References	90
Subpart 2.15	**Quality Assurance Requirements for Hoisting, Rigging, and Transporting of Items for Nuclear Power Plants**	92
Subpart 2.17	**Quality Assurance Requirements for Electronic Quality Assurance Records Systems**	93
100	General	93
200	General Requirements	93
300	Record Recovery	93
400	Access Control and Retrieval	94
500	Digital and Physical Security	94
600	Electronic Data Integrity	94
700	Disposal of Records	94
800	Acquisition, Development, and Maintenance of Electronic Records Systems	94
Subpart 2.18	**Quality Assurance Requirements for Maintenance of Nuclear Facilities**	95
100	General	95
200	General Requirements	95
300	Preventive Maintenance	96
400	Corrective Maintenance	97
500	Records	97
Subpart 2.19	**Quality Assurance Requirements for the Use of Supplier Accreditation for Calibration or Testing Services**	98
100	General	98
200	Requirements	98

Subpart 2.20	**Quality Assurance Requirements for Subsurface Investigations for Nuclear Facilities**	100
100	General	100
200	General Requirements	100
300	Verification	101
400	Field Investigation	102
500	Laboratory Testing	104
600	Engineering Evaluation and Analysis	105
700	Records	105
Subpart 2.22	**Quality Assurance Requirements for Management Assessment and Quality Improvement for Compliance With 10 CFR 830 and Department of Energy (DOE) Order 414.1 for DOE Nuclear Facilities**	106
100	General	106
200	Management Assessment Requirements	107
300	Quality Improvement	108
400	Records	109
500	References	109
Subpart 2.25	**Quality Assurance Requirements for High-Level Waste Custodians**	110
100	General	110
200	Requirements	110
Part III	**Guidance for Implementing Parts I and II Requirements**	115
	Introduction	115
100	Purpose	115
200	Applicability	115
Subpart 3.1	**Guidance for Implementing Part I Requirements**	116
Subpart 3.1-1.1	**Implementing Guidance for Part I, Requirement 1: Organization**	117
100	General	117
200	Organizational Structure	117
300	Basic Principles	117
Subpart 3.1-2.1	**Implementing Guidance for Part I, Requirement 2: Quality Assurance Programs**	118
100	General	118
200	Program Format	118
300	Program Development	118
400	Work Requirements and Performance	119
500	Work Processes	119
600	Training and Qualification	120
700	Assessment of Performance	120
Subpart 3.1-2.2	**Implementing Guidance for Part I, Requirement 2: Quality Assurance Programs, Lead Auditor Qualification**	121
100	General	121
200	Education and Experience	121
300	Records	121
Subpart 3.1-2.3	**Implementing Guidance for Part I, Requirement 2: Quality Assurance Programs, Inspection and Test Personnel Qualification**	124
100	General	124

200	Functional Qualifications	124
300	Education and Experience Qualifications	124
400	Use of Inspection and Test Personnel	125
Subpart 3.1-2.4	**Implementing Guidance for Part I, Requirement 2: Quality Assurance Programs, Management Assessment of the QA Program**	126
100	General	126
200	Types of Management Assessment	126
300	Scheduling and Planning	126
400	Assessment Performance	127
500	Reporting	128
Subpart 3.1-2.5	**Risk-Informed Approach for the Treatment of Structures, Systems, and Components for Nuclear Facilities Not Subject to NRC Regulation**	129
100	General	129
200	SSC Categorization	130
300	Adaptation	130
400	Implementation Guidance	131
500	Computer Software	134
600	Feedback and Progress Adjustment	134
700	10 CFR 50.69 Implementation References From EPRI	134
Subpart 3.1-3.1	**Implementing Guidance for Part I, Requirement 3: Design Control**	135
100	General	135
200	Design Input	135
300	Design Process	136
400	Design Analysis	137
500	Design Verification	138
600	Change Control	138
700	Use of Reverse-Engineering Techniques	139
800	Interface Control	140
900	Documentation and Records	140
1000	Reference	140
Subpart 3.1-4.1	**Implementing Guidance for Part I, Requirement 4: Procurement Document Control**	141
100	General	141
200	Procurement Document Review	141
300	Typical Scope of Procurement Effort	141
400	Categorization of Procurement Actions	142
500	General Logic Considerations	142
600	Logic Chart	143
700	Methods of Specifying Quality Assurance Program Requirements	143
Subpart 3.1-7.1	**Implementing Guidance for Part I, Requirement 7: Control of Purchased Items and Services**	146
100	General	146
200	Procurement Planning	146
300	Supplier Selection	146
400	Bid Evaluation	147

500	Purchaser/Supplier Communications	147
600	Control of Changes in Items or Services	147
700	Product Acceptance	147
Subpart 3.1-10.1	**Implementing Guidance for Part I, Requirement 10: Inspection**	149
100	General	149
200	Inspection and Process Monitoring	149
300	In-Service Inspection	149
Subpart 3.1-15.1	**Implementing Guidance for Part I, Requirement 15: Control of Nonconforming Items**	150
100	General	150
200	Identification	150
300	Segregation	150
400	Disposition	150
Subpart 3.1-16.1	**Implementing Guidance for Part I, Requirement 16: Corrective Action**	153
100	General	153
200	Corrective Action	153
300	Basic Corrective Action Elements	153
400	Management Involvement	155
500	Process Chart	155
Subpart 3.1-16.2	**Implementing Guidance for Part I, Requirement 16: Trend Analysis**	156
100	General	156
200	Definitions	156
300	Trending Program	156
400	Data Collection	157
500	Trend Analysis Process	157
600	Trend Reporting	158
700	Records	159
800	References and Recommended Reading	159
Subpart 3.1-17.1	**Implementing Guidance for Part I, Requirement 17: Quality Assurance Records**	160
100	General	160
200	List of Typical Lifetime Records	161
Subpart 3.1-17.2	**Implementing Guidance for Part I, Requirement 17: Quality Assurance Records, Electronic Records**	164
100	General	164
200	Authentication of Records	164
300	Generation of Records	165
400	Receipt Control of Records	165
500	Storage	166
600	Access Control and Retrieval	166
700	Disposal of Records	167
800	Maintenance of Records System	168
900	System Integrity and Record Recovery	168
Subpart 3.1-18.1	**Implementing Guidance for Part I, Requirement 18: Audits**	169
100	General	169
200	Audit Administration	169

300	Preparation for Auditing	170
400	Audit Performance	171
500	Reporting	172
600	Response	172
700	Follow-Up Action	172
Subpart 3.1-18.2	**Implementing Guidance on Classification and Handling Audit Issues**	173
100	General	173
200	Introduction	173
300	Classification of Issues	173
400	Responses to Issues	174
500	Follow-Up	174
Subpart 3.1-18.3	**Implementing Guidance for Part I, Requirement 18: Audits, Use of Surveillance**	175
100	General	175
200	Planning and Scheduling	175
300	Preparation	175
400	Performance	176
500	Reporting and Communication	177
600	Resolution of Issues	177
Subpart 3.2	**Guidance for Implementing Part II Requirements**	178
Subpart 3.2-2.1	**Implementing Guidance for Part II, Requirement 2.1: Cleaning of Fluid Systems**	179
100	General	179
200	Applicability	179
300	Cleaning Recommendations and Precautions	179
400	Guidelines for Assigning Cleanness Classifications	179
Subpart 3.2-2.7.1	**Implementing Guidance for Part II, Requirement 2.7: Quality Assurance Requirements for Computer Software for Nuclear Facility Applications**	180
	Introduction	180
100	General	180
200	General Requirements	182
300	Software Acquisition	183
400	Software Engineering Method	184
500	Standards, Conventions, and Other Work Practices	188
600	Support Software	188
700	References	188
Subpart 3.2-2.7.2	**Implementation Guidance on the Requirements of ASME NQA-1, Parts I and II for Software Used for Nuclear Facility Applications**	189
	Introduction	189
100	General	189
200	Flowchart Approach	189
Subpart 3.2-2.14	**Implementing Guidance for Part II, Requirement 2.14: Quality Assurance Requirements for Commercial Grade Items and Services, Commercial Grade Computer Programs, and Software Services**	212
100	General	212

200	Definition Applications	213
300	Utilization	213
400	Technical Evaluation	213
500	Critical Characteristics	214
600	Methods for Accepting Commercial Grade Items and Services	215
700	Commercial Grade Software Services	221
800	Documentation	221
900	References	222
Subpart 3.2-2.15	**Implementing Guidance for Part II, Requirement 2.15: Hoisting, Rigging, and Transportation**	223
100	General	223
Subpart 3.2-2.18.1	**Implementing Guidance for Part II, Requirement 2.18: Maintenance of Nuclear Facilities, Establishing and Maintaining Equipment Histories**	224
100	General	224
200	Developing an Equipment History	224
300	Maintaining Historical Data	224
400	Using Maintenance History	224
Subpart 3.2-2.18.2	**Implementing Guidance for Part II, Requirement 2.18: Maintenance of Nuclear Facilities, Engineering Evaluations of Equipment Failures**	225
100	Introduction	225
200	Engineering Evaluations	225
Subpart 3.2-2.20	**Implementing Guidance for Part II, Requirement 2.20: Subsurface Investigations for Nuclear Power Plants, Sample Control and Identification**	227
100	General	227
200	Control of Subsurface Investigations	227
300	Identification of Samples	227
400	Control of Samples	227
Subpart 3.3	**Nonmandatory Guidance on Quality Assurance Program Requirements for Collection of Scientific and Technical Information for Site Characterization of High-Level Nuclear Waste Repositories**	228
Part IV	**Guidance on the Application and Use of ASME NQA-1**	229
	Introduction	229
100	Purpose	229
200	Applicability	229
Subpart 4.1	**Guides on Use and Comparison of ASME NQA-1 With Other Quality Requirements**	230
Subpart 4.1.1	**Guidance to Modification of an ISO 9001:2015 Quality Management System for Compliance With ASME NQA-1, Part I**	230
100	Purpose and Scope	230
200	Background	230
300	Terms and Definitions	230
400	Comparison Tables	230

Subpart 4.1.2 **Guidance on the Use of ASME NQA-1–2008/1a–2009 for Compliance With Department of Energy Quality Assurance Requirements 10 CFR 830, Subpart A and DOE O 414.1** 244
100 Purpose 244
200 Introduction 244
300 DOE Rule and Order General QAP Requirements 244
400 DOE Rule and Order QA Criteria 244
Subpart 4.1.3 **Guidance on the Use of ASME NQA-1–2015 for Compliance With 10 CFR 71 and/or 10 CFR 72 Requirements** 249
100 Purpose 249
200 Introduction 249
300 Summary Results 249
Subpart 4.1.4 **Guidance to Modification of an IAEA GS-R-3 Quality Program to Meet ASME NQA-1a–2009 Requirements and Modification of an ASME NQA-1a–2009 Quality Program to Meet IAEA GS-R-3 Requirements** 255
100 Purpose and Scope 255
200 Applicability 255
300 Background 255
400 How to Use This Guide to Achieve Compliance With IAEA GS-R-3 or ASME NQA-1 256
Subpart 4.1.5 **Guidance to Modification of an ANSI/ANS-15.8-1995 (R2005; R2013) Quality Program to Meet ASME NQA-1–2012 Requirements** . . . 274
100 Introduction 274
200 Applicability 274
300 Background 274
400 Terms and Definitions 274
500 How to Use the Guide to Achieve Compliance With ASME NQA-1 or an ANSI/ANS-15.8 Quality Program 274
Subpart 4.1.6 **Guidance to Modification of an ASME NQA-1–2019 Quality Program to Meet IAEA GSR Part 2 (2016) Management System Requirements** 288
100 Purpose and Scope 288
200 Applicability 288
300 Background 288
400 How to Use This Guide to Achieve Compliance With ASME NQA-1 . . . 288
Subpart 4.2 **Guides on Application of ASME NQA-1 to Work Processes and Activities** 295
Subpart 4.2.1 **Guidance on Graded Application of Nuclear Quality Assurance (NQA) Standard for Research and Development** 295
100 Introduction 295
200 Research and Development Quality Assurance Through Peer Review . . 297
300 A Graded Approach 297
400 Quality Assurance Research and Development Applications 297
500 Research and Development Quality Assurance Glossary of Terms 298
600 Application of ASME NQA-1 to Research and Development Activities . . 298
700 Technology Life Cycle (Subpart 4.2.1) and Technology Readiness Levels 303
Subpart 4.2.3 **Guidance on Qualification of Existing Data** 305
100 General 305

200	Selecting Data Sets for Qualification	305
300	Data Qualification Process	305
400	Qualification Methods	305
500	Documentation of Results	306
Subpart 4.2.4	**Guidance on the Control of Scientific Investigations**	307
100	General	307
200	Planning and Performing Scientific Investigations	307
300	Technical Data	308
400	Sample Control	308
500	Peer Review	309
Subpart 4.2.5	**Guidance on the Transition From Construction to Operation for Nuclear Facilities**	310
100	General	310
200	Applicability	310
300	Transition Recommendations	310
400	Records	313
Subpart 4.2.6	**Guidance on Quality Assurance for Decommissioning of Nuclear Facilities**	314
100	General	314
200	Prerequisites	314
300	Predecommissioning Checks	315
400	Control During Decommissioning	317
500	Postdecommissioning Checks	318
600	Records	318
Subpart 4.2.7	**Guidance on Peer Review**	319
100	General	319
200	Terms and Definitions	319
300	Performance	319
400	Reviewer Selection	321
500	Comment Resolution	321
600	Peer Review Report	321
700	Records	322
Subpart 4.2.8	**Guidance for Prevention, Detection, and Control of Counterfeit, Fraudulent, or Suspect Items (CFSI)**	323
100	General	323
200	Prevention	324
300	Detection	324
400	Control	325
500	Records	326
600	References	326
Subpart 4.2.9	**Guidance on Quality Assurance for Low-Level Waste Shipping From Nuclear Facilities**	327
100	General	327
200	Prerequisites	332
300	Preshipping Checks	332
400	Procurement of Items and Services	334

500 Containers/Packaging 334
600 Equipment and Calibration 334
700 Disposition 334
800 Shipping Vehicle Inspection 335
900 Audits 335
1000 Post-Shipping Checks 335
1100 Records 335

Figures

300 Sample Form for Record of Lead Auditor Qualification 122
102-1 §50.69 RISC Categories 130
200-1 Summary of NEI 00-04 Categorization Process 131
600 Logic Chart for Determining Appropriate Quality Requirements 144
100 Nonconforming Item Process Chart 151
300 Corrective Action Process Chart 155
201-1 Software Engineering 191
201-2 Software Design Requirements 196
201-3 Software Configuration Management 197
201-4 Support Software and Tools 198
201-5 Problem Reporting and Corrective Action 199
201-6 Software Design 201
201-7 Software Reviews 202
201-8 Software Design Implementation 203
201-9 Computer Program Testing 204
201-10 Software Operation, Maintenance, and Retirement 207
201-11 Software Acquisition 208
201-12 Computer Program Use in Design Analysis 210
202-1 Legend for Flowcharts 211
103 Technology Life Cycle 296
100-1 Low-Level Water Shipper Guidance 337

Tables

302.5 Summary Table for Cleanness Classes 40
304.1 Water Requirements 41
304.4 Flushing Requirements for Hydraulic, Instrument Control, and Lubrication Systems 41
506 Required In-Process Tests for Compacted Fill 64
301 127
401.4 Scenarios for Use of Computer Programs in Design Analysis 139
501 Typical Critical Characteristics to Consider for Computer Programs . . . 216
400-1 ASME NQA-1, Part I, Requirement 1 (Organization) and Corresponding ISO 9001 Clauses 231
400-2 ASME NQA-1, Part I, Requirement 2 (Quality Assurance Program) and Corresponding ISO 9001 Clauses 232
400-3 ASME NQA-1, Part I, Requirement 3 (Design Control) and Corresponding ISO 9001 Clauses 233

400-4 ASME NQA-1, Part I, Requirement 4 (Procurement Document Control) and Corresponding ISO 9001 Clauses 234
400-5 ASME NQA-1, Part I, Requirement 5 (Instructions, Procedures, and Drawings) and Corresponding ISO 9001 Clauses 234
400-6 ASME NQA-1, Part I, Requirement 6 (Document Control) and Corresponding ISO 9001 Clauses 235
400-7 ASME NQA-1, Part I, Requirement 7 (Control of Purchased Items and Services) and Corresponding ISO 9001 Clauses 236
400-8 ASME NQA-1, Part I, Requirement 8 (Identification and Control of Items) and Corresponding ISO 9001 Clauses 237
400-9 ASME NQA-1, Part I, Requirement 9 (Control of Special Processes) and Corresponding ISO 9001 Clauses 237
400-10 ASME NQA-1, Part I, Requirement 10 (Inspection) and Corresponding ISO 9001 Clauses 238
400-11 ASME NQA-1, Part I, Requirement 11 (Test Control) and Corresponding ISO 9001 Clauses 238
400-12 ASME NQA-1, Part I, Requirement 12 (Control of Measuring and Test Equipment) and Corresponding ISO 9001 Clauses 239
400-13 ASME NQA-1, Part I, Requirement 13 (Handling, Storage, and Shipping) and Corresponding ISO 9001 Clauses 240
400-14 ASME NQA-1, Part I, Requirement 14 (Inspection, Test, and Operating Status) and Corresponding ISO 9001 Clauses 240
400-15 ASME NQA-1, Part I, Requirement 15 (Control of Nonconforming Items) and Corresponding ISO 9001 Clauses 241
400-16 ASME NQA-1, Part I, Requirement 16 (Corrective Action) and Corresponding ISO 9001 Clauses 241
400-17 ASME NQA-1, Part I, Requirement 17 (Quality Assurance Records) and Corresponding ISO 9001 Clauses 242
400-18 ASME NQA-1, Part I, Requirement 18 (Audits) and Corresponding ISO 9001 Clauses 243
300 10 CFR 830 Subpart A, Dated January 10, 2001 §830.121, Quality Assurance Program; DOE O 414.1C, Dated June 17, 2005 245
400 10 CFR 830 Subpart A, Dated January 10, 2001 §830.122, Quality Assurance Criteria 246
300 10 CFR 71 and 10 CFR 72 Criteria Addressed by ASME NQA-1 250
I The Extent to Which GS-R-3 Addresses ASME NQA-1 Requirements . . 257
II The Extent to Which ASME NQA-1 Addresses GS-R-3 Requirements . . 266
200-1 Corresponding NQA Sections (Introduction) to ANSI/ANS-15.8 275
200-2 Corresponding NQA Sections (Requirement 1) to ANSI/ANS-15.8 275
200-3 Corresponding NQA Sections (Requirement 2) to ANSI/ANS-15.8 276
200-4 Corresponding NQA Sections (Requirement 3) to ANSI/ANS-15.8 277
200-5 Corresponding NQA Sections (Requirement 4) to ANSI/ANS-15.8 278
200-6 Corresponding NQA Section (Requirement 5) to ANSI/ANS-15.8 278
200-7 Corresponding NQA Sections (Requirement 6) to ANSI/ANS-15.8 278
200-8 Corresponding NQA Sections (Requirement 7) to ANSI/ANS-15.8 279
200-9 Corresponding NQA Sections (Requirement 8) to ANSI/ANS-15.8 280
200-10 Corresponding NQA Sections (Requirement 9) to ANSI/ANS-15.8 280
200-11 Corresponding NQA Sections (Requirement 10) to ANSI/ANS-15.8 . . . 281
200-12 Corresponding NQA Sections (Requirement 11) to ANSI/ANS-15.8 . . . 282

200-13	Corresponding NQA Sections (Requirement 12) to ANSI/ANS-15.8 . . .	282
200-14	Corresponding NQA Sections (Requirement 13) to ANSI/ANS-15.8 . . .	283
200-15	Corresponding NQA Section (Requirement 14) to ANSI/ANS-15.8	283
200-16	Corresponding NQA Sections (Requirement 15) to ANSI/ANS-15.8 . . .	283
200-17	Corresponding NQA Section (Requirement 16) to ANSI/ANS-15.8	284
200-18	Corresponding NQA Sections (Requirement 17) to ANSI/ANS-15.8 . . .	285
200-19	Corresponding NQA Sections (Requirement 18) to ANSI/ANS-15.8 . . .	285
200-20	Corresponding NQA Sections (Parts I and II) to ANSI/ANS-15.8	286
200-21	Corresponding NQA Sections (Part II) to ANSI/ANS-15.8	287
400-1	The Extent to Which ASME NQA-1 Addresses GSR Part 2 Requirements	289
600-1	Guidance on Graded Application of the NQA Standard for Research and Development	299
600-2	Software Within Research and Development	299
700	Comparison of Subpart 4.2.1 Technology Life Cycle and Technology Readiness Levels	304
100-1	Regulation and Other References	328