

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
	Organization	5
Requirement 1		
100	General	5
200	Structure and Responsibility	5
300	Interface Control	5
	Quality Assurance Program	6
Requirement 2		
100	General	6
200	Indoctrination and Training	6
300	Qualification Requirements	6
400	Records of Qualification	8
500	Records	8
	Design Control	9
Requirement 3		
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
	Procurement Document Control	12
Requirement 4		
100	General	12
200	Content of the Procurement Documents	12
300	Procurement Document Review	12
400	Procurement Document Changes	12
	Instructions, Procedures, and Drawings	13
Requirement 5		

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

FOREWORD

This Standard is intended to serve the global nuclear industry responsible for the safety and quality of nuclear facilities and activities.

It is intended to be applied to any structure, system, component, activity, or organization that is essential to the safe, reliable, and efficient performance of a nuclear facility and any activities independent of a facility that may affect performance. It is also intended to be applied to all phases of a nuclear facility life cycle and to related activities.

This Standard reflects industry experience and current understanding of the quality assurance requirements necessary to achieve safe, reliable, and efficient utilization of nuclear energy and management and processing of radioactive materials. The Committee on Nuclear Quality Assurance (NQA) actively endorses the growing worldwide movement toward rational, cost-effective quality assurance practices — practices that focus on results. The NQA Committee also maintains liaison with national and international groups that have similar interests in quality to assure consistency and maximum applicability of the Standard in a global setting. Consequently, the NQA Committee has regularly updated and revised the Standard since its first edition was issued in 1979 to improve its utility, effect on nuclear safety, and value to the nuclear industry.

This Standard includes requirements and guidance and is organized in the following four parts:

- (a) **Part I** contains requirements for a Quality Assurance Program for nuclear facility applications.
- (b) **Part II** contains additional quality assurance requirements for the planning and conduct of specific work activities conducted under a Quality Assurance Program developed in accordance with **Part I**.
- (c) **Part III** contains guidance for implementing the requirements of **Parts I** and **II**.
- (d) **Part IV** contains guidance for the application of ASME NQA-1 and comparisons of ASME NQA-1 with other quality requirements.

Early in 1975, the American National Standards Institute (ANSI) assigned overall responsibility for coordination among technical societies and development and maintenance of nuclear power quality assurance standards to the American Society of Mechanical Engineers (ASME). The ASME Committee on NQA was constituted on October 3, 1975, and assumed responsibility for the ANSI/ASME N45 series documents. Currently, the NQA Committee operates under the ASME requirements for Nuclear Codes and Standards Development Committees.

This Committee initially prepared

ANSI/ASME NQA-1-1979	Quality Assurance Program Requirements for Nuclear Power Plants
ANSI/ASME NQA-2-1983	Quality Assurance Requirements for Nuclear Power Plants
ANSI/ASME NQA-3-1989	Quality Assurance Requirements for High Level Waste Management

Requests for interpretation or suggestions for improvement of this Standard should be submitted in accordance with [Correspondence With the NQA Committee](#).

Following approval by the ASME NQA Committee and ASME, and after public review, ASME NQA-1-2022 was approved by ANSI as an American National Standard on February 2, 2022.

For a listing of the NQA publication history, refer to the following table:

Historical Listing of ASME NQA Publications

NQA-1			NQA-2			NQA-3		
Editions and Addenda	Designator	Issued	Editions and Addenda	Designator	Issued	Editions and Addenda	Designator	Issued
1st Ed.	NQA-1-1979	8/31/1979	...	...	...	...	...	...
Add.	NQA-1a-1981	4/30/1981	...	...	...	...	...	...
Add.	NQA-1b-1981	1/31/1982	...	...	...	...	...	...
2nd Ed.	NQA-1-1983	7/1/1983	1st Ed.	NQA-2-1983	8/31/1983	...	...	...
Add.	NQA-1a-1983	12/31/1983	Add.	NQA-2a-1985	10/15/1985	...	...	...
Add.	NQA-1b-1984	3/15/1985	...	...	...	...	...	...
Add.	NQA-1c-1985	12/31/1985	...	...	...	...	...	...
3rd Ed.	NQA-1-1986	7/1/1986	2nd Ed.	NQA-2-1986	7/1/1986	...	...	...
Add.	NQA-1a-1986	2/15/1987	Add.	NQA-2a-1986	2/15/1987	...	...	...
Add.	NQA-1b-1987	3/15/1988	Add.	NQA-2b-1987	4/15/1988	...	...	...
Add.	NQA-1c-1988	2/28/1989	Add.	NQA-2c-1988	2/28/1989	...	...	...
4th Ed.	NQA-1-1989	9/15/1989	3rd Ed.	NQA-2-1989	9/30/1989	1st Ed.	NQA-3-1989	3/23/1990
Add.	NQA-1a-1989	3/31/1990	Add.	NQA-2a-1990	5/31/1990	...	...	...
Add.	NQA-1b-1991	4/15/1991	Add.	NQA-2b-1991	5/12/1992	...	...	...
Add.	NQA-1c-1992	9/30/1992	...	...	...	...	...	...
5th Ed.	NQA-1-1994 [Note (1)]	7/29/1994	...	...	...	...	...	...
Add.	NQA-1a-1995	1/19/1996	...	...	...	...	...	...
6th Ed.	NQA-1-1997	12/31/1997	...	...	...	...	...	...
Add.	NQA-1a-1999	5/25/1999	...	...	...	...	...	...
7th Ed.	NQA-1-2000	5/21/2001	...	...	...	...	...	...
Add.	NQA-1a-2002	12/6/2002	...	...	...	...	...	...
8th Ed.	NQA-1-2004	12/22/2004	...	...	...	...	...	...
Add.	NQA-1a-2005	5/3/2006	...	...	...	...	...	...
Add.	NQA-1b-2007	6/1/2007	...	...	...	...	...	...
9th Ed.	NQA-1-2008	3/14/2008	...	...	...	...	...	...
Add.	NQA-1a-2009	7/20/2009	...	...	...	...	...	...
Add.	NQA-1b-2011	1/4/2011	...	...	...	...	...	...
10th Ed.	NQA-1-2012	3/15/2013	...	...	...	...	...	...
11th Ed.	NQA-1-2015	2/20/2015	...	...	...	...	...	...
12th Ed.	NQA-1-2017	1/18/2018	...	...	...	...	...	...
13th Ed.	NQA-1-2019	12/31/2019	...	...	...	...	...	...
14th Ed.	NQA-1-2022	6/30/22	...	...	...	...	...	...

GENERAL NOTE: NQA editions and addenda prior to 1989 were titled ANSI/ASME NQA.

NOTE: (1) This edition is a consolidation of ASME NQA-1 and ASME NQA-2.

ASME NQA COMMITTEE

Nuclear Quality Assurance

(The following is the roster of the Committee at the time of approval of this Standard.)

STANDARDS COMMITTEE OFFICERS

J. W. McIntyre, *Chair*
T. J. Sandquist, *Vice Chair*
D. Sparkman, *Vice Chair*
A. Maslowski, *Secretary*

STANDARDS COMMITTEE PERSONNEL

J. G. Adkins, Consultant
A. Appleton, Alloy Stainless Products Co., Inc.
J. E. Bergstrom, Bergstrom Consulting
R. L. Blyth, Consultant
A. C. Cole, The Hartford Steam Boiler Inspection and Insurance Co.
M. K. Cox, BWXT NOG-L
R. Czuba, Sonic Systems International, Inc.
G. Danielson, TechSource, Inc.
C. Givens, Bechtel National, Inc.
V. J. Grosso, Mission Support and Test Service (MSTS)
R. S. Jolly, Bechtel Power Corp.
C. R. Martin, Longnecker and Associates
A. Maslowski, The American Society of Mechanical Engineers
J. W. McIntyre, Sargent and Lundy, LLC
N. Moreau, Theseus Professional Services, LLC
K. L. Morris, Ellis and Watts Global Industries, Inc.
C. H. Moseley, Jr., Edgewater Technical Associates
T. Muraki, Advanced Technology
M. F. Nicol, ARS Aleut Remediation, LLC
C. M. Palay, U.S. Department of Energy
P. F. Prescott, U.S. Nuclear Regulatory Commission
D. W. Prigel, X-energy
E. Renaud, Westinghouse Electric Co.
R. A. Sacco, Shine Medical Technologies
T. S. Sandquist, Los Alamos National Laboratory
D. Sparkman, Sparkman and Associates, LLC
L. Taggart, Paragon Energy Solutions
M. H. Tannenbaum, Electric Power Research Institute
W. G. Ware, Consultant
J. R. Yanek, Executive Services NQA ESH
J. M. Ziemba, Atkins Global — Member of the SNC-Lavalin Group
D. C. Agarwal, *Contributing Member*, Consultant
M. Concepcion-Robles, *Contributing Member*, Dominion Energy Services, Inc.
J. DeKleine, *Contributing Member*, Axion Technical Services, LLC
D. J. Gregory, *Contributing Member*, Los Alamos National Laboratory
K. A. Morrell, *Contributing Member*, SRNS
W. Sowder, Jr., *Contributing Member*, Quality Management Services, LLC
R. A. Symes, *Contributing Member*, Consultant
S. Bernsen, *Honorary Member*, Consultant
D. Brown, *Honorary Member*, Sargent and Lundy, LLC
T. E. Dunn, *Honorary Member*, Performance Development Corp.
R. Schrotke, Jr., *Honorary Member*, Ron Schrotke, LLC

EXECUTIVE COMMITTEE ON NUCLEAR QUALITY

T. S. Sandquist, *Chair*, Los Alamos National Laboratory
D. Sparkman, *Chair*, Sparkman and Associates, LLC
J. W. McIntyre, *Vice Chair*, Sargent and Lundy, LLC
A. Maslowski, *Secretary*, The American Society of Mechanical Engineers
J. E. Bergstrom, Bergstrom Consulting
R. L. Blyth, Consultant
A. C. Cole, The Hartford Steam Boiler Inspection and Insurance Co.
C. Givens, Bechtel National, Inc.
D. J. Gregory, Los Alamos National Laboratory
V. J. Grosso, Mission Support and Test Service (MSTS)
M. F. Nicol, ARS Aleut Remediation, LLC
C. M. Palay, U.S. Department of Energy
P. F. Prescott, U.S. Nuclear Regulatory Commission
D. W. Prigel, X-energy
E. Renaud, Westinghouse Electric Co.
R. A. Sacco, Shine Medical Technologies
L. Taggart, Paragon Energy Solutions

SUBCOMMITTEE ON APPLICATIONS

D. J. Gregory, *Chair*, Los Alamos National Laboratory
S. D. Diffey, *Vice Chair*, Los Alamos National Laboratory
T. M. Grace, *Vice Chair*, Bechtel — Nuclear, Security, and Environmental
K. Deike, *Secretary*, Los Alamos National Laboratory
N. R. Barker, Boston Government Services
C. Beaman, U.S. Department of Energy

R. D. Brown, Atkins Global — Member of the SNC-Lavalin Group
A. C. Cole, The Hartford Steam Boiler Inspection and Insurance Co.
G. Danielson, TechSource, Inc.
D. A. Morley, S. A. Technologies
C. H. Moseley, Jr., Edgewater Technical Associates
G. Udent, Consultant

SUBCOMMITTEE ON ASSESSMENT AND VERIFICATION

L. Taggart, *Chair*, Paragon Energy Solutions
J. M. Ziemba, *Vice Chair*, Atkins Global — Member of the SNC-Lavalin Group
B. Blum, *Secretary*, Consultant
S. F. Borland, Curtiss-Wright Nuclear Canada
R. Carbonneau, Arizona Public Service
M. Concepcion-Robles, Dominion Energy Services, Inc.
M. Coren, Duke Energy
J. Ellis, U.S. Environmental Protection Agency
E. D. Groover, Consultant
J. G. Ice, Exelon
K. Iwasawa, Toshiba Corp. Power Systems Co.
D. J. Jantosik, Sequoia Consulting Group, Inc.
R. M. Joschak, Framatome, Inc.
J. W. McIntyre, Sargent and Lundy, LLC

K. Miller, Sargent and Lundy, LLC
K. L. Morris, Ellis and Watts Global Industries, Inc.
J. A. Ortega-Luciano, U.S. Nuclear Regulatory Commission
C. M. Palay, U.S. Department of Energy
M. D. Porter, Exelon Nuclear
G. C. Smolens, Department of Energy, National Nuclear Security Administration
R. A. Symes, Consultant
J. Verderber, Washington River Protection Solutions
J. W. Wilson, BWX Technologies, Inc. — Nuclear Operations Group
T. S. Sandquist, *Contributing Member*, Los Alamos National Laboratory
W. Sowder, Jr., *Contributing Member*, Quality Management Services, LLC

SUBCOMMITTEE ON ENGINEERING AND PROCUREMENT PROCESSES

V. J. Grosso, *Chair*, Mission Support and Test Service (MSTS)
R. Czuba, *Vice Chair*, Sonic Systems International, Inc.
T. Bolt, *Secretary*, Paragon
Z. Betsill, Southern Nuclear Operating Co.
R. L. Boler, Consultant
S. Daw, Battelle Energy Alliance
J. DeKleine, Axion Technical Services, LLC
R. W. Dillman, Savannah River Nuclear Solutions
D. Ethington, GE Hitachi Nuclear Energy
S. T. Fairburn, BWX Technologies, Inc.
R. Horst, National Nuclear Security Administration
R. S. Jolly, Bechtel Power Corp.
K. Kavanagh, U.S. Nuclear Regulatory Commission
P. Kilroy, Waste Treatment Completion Co., LLC

J. D. Lipsky, Consultant
G. Oliveros, SGS
P. F. Prescott, U.S. Nuclear Regulatory Commission
E. Renaud, Westinghouse Electric Co.
T. N. Rezk, Bechtel Power Corp.
D. Y. Roberts, Engine Systems, Inc.
T. S. Sandquist, Los Alamos National Laboratory
M. H. Tannenbaum, Electric Power Research Institute
M. Vann Mitchell, Mitsubishi Nuclear Energy Systems
W. G. Ware, Consultant
J. R. Yanek, Executive Services NQA ESH
P. J. Anderson, *Contributing Member*, Dominion Energy Services, Inc.
N. Sakamoto, *Contributing Member*, Mitsubishi Heavy Industries, Ltd.

SUBCOMMITTEE ON INTERFACES AND ADMINISTRATION

R. A. Sacco, *Chair*, Shine Medical Technologies
D. W. Prigel, *Vice Chair*, X-energy
R. Czuba, *Secretary*, Sonic Systems International, Inc.
J. G. Adkins, Consultant
J. E. Bergstrom, Bergstrom Consulting
S. D. Diffey, Los Alamos National Laboratory
B. Frank, Westinghouse Electric Co.

J. W. McIntyre, Sargent and Lundy, LLC
C. H. Moseley, Jr., Edgewater Technical Associates
R. W. VonRoble, VonRoble Consulting
R. Wood, Consultant
J. M. Ziemba, Atkins Global — Member of the SNC-Lavalin Group
M. E. Smith, *Contributing Member*, Nuclear Innovation North America
L. Taggart, *Contributing Member*, Paragon Energy Solutions

SUBCOMMITTEE ON INTERNATIONAL ACTIVITIES

- D. W. Prigel**, *Chair*, X-energy
T. R. Verma, *Vice Chair*, Consultant
R. W. VonRoble, *Vice Chair*, VonRoble Consulting
A. Maslowski, *Secretary*, The American Society of Mechanical Engineers
D. Holler, *Secretary*, X-energy
D. C. Agarwal, Consultant
P. Ancion, Westinghouse Belgium
B. Basu, Ranjan Consulting Engineers (OPC)
P. Callens, Vinçotte
A. V. Chermak, Battelle Energy Alliance
- G. Danielson**, TechSource, Inc.
S. F. K. Dzide, Nuclear Regulatory Authority, Ghana
C. Kofi Klutse, Ghana Atomic Energy Commission
N. Moreau, Theseus Professional Services, LLC
A. Sengupta, U.S. Department of Transportation
M. Vann Mitchell, Mitsubishi Nuclear Energy Systems
B. Wang, Shanghai Nuclear Engineering Research and Design Institute Co., Ltd.
M. Sharma, *Contributing Member*, ASME India
J. Zhang, *Contributing Member*, ASME Asia Pacific, LLC

CHINA INTERNATIONAL WORKING GROUP

- W. Bin**, *Chair*, Shanghai Nuclear Engineering Research and Design Institute
Z. Bo, Shengyang Blower Works Group Nuclear Pump Co., Ltd.
J. Fei, China National Erzhong Group Co.
L. Haibin, Shanghai Nuclear Engineering Research and Design Institute (SNERDI)
D. Hongwei, Nuclear and Radiation Safety Center
D. Hui, State Nuclear Baotai Zirconium Industry Co.
S. Jianmin, Shanghai Nuclear Engineering Research and Design Institute Co., Ltd. (SNERDI)
F. Jianping, Nuclear Regulatory Department on Nuclear Power of NNSA
- Z. Jin**, China Productivity Center for Machinery
X. Lang, Dalian DV Valve Co., Ltd.
J. Long, Shanghai Electric — KSB Nuclear Pumps and Valves Co., Ltd.
G. Meng, China Nuclear Power Engineering Co., Ltd.
H. Mingxuan, China Nuclear Power Engineering Co., Ltd.
S. Peng, Harbin Electric Corp. (QHD) Heavy Equipment Co., Ltd.
X. Qin, Shanghai Nuclear Engineering Research and Design Institute Co., Ltd. (SNERDI)
P. Ruihua, Sanmen Nuclear Power Co.
B. Shao, China Nuclear Power Engineering Co., Ltd.
X. Xue, Shanghai Nuclear Engineering Research and Design Institute Co., Ltd. (SNERDI)

EUROPE INTERNATIONAL WORKING GROUP

- P. Ancion**, *Chair*, Westinghouse Belgium
P. Callens, *Secretary*, Vinçotte
D. Duba, TÜV Nord Systems GmbH and Co. KG
D. Koelbl, CIS GmbH, TÜV Thüringen Group
- M. H. Koeppen**, Framatome GmbH
H. Malkhasyan, Worleyparsons Nuclear Services
J. Wendt, TÜV Sud Industrie Service GmbH
C. Yilmaz, Schneider Electric/Gutor Electronic, LLC

INDIA INTERNATIONAL WORKING GROUP

- B. Basu**, *Chair*, Ranjan Consulting Engineers (OPC)
A. D. Bagdare, *Vice Chair*, Godrej Precision Engineering
V. Sehgal, *Vice Chair*, Larsen and Toubro
R. Sahai, *Secretary*, Nuclear Power Corp. of India, Ltd.
- N. Mistry**, The Hartford Steam Boiler Inspection and Insurance Co.
M. R. Nadgouda, Mazagon Dock, Ltd.
D. Narain, RPG (LWRD), BARC
S. Subramanyam, Larsen and Toubro

SUBCOMMITTEE ON PROGRAM MANAGEMENT PROCESS

- R. L. Blyth**, *Chair*, Consultant
J. E. Bergstrom, *Vice Chair*, Bergstrom Consulting
M. K. Cox, *Secretary*, BWXT Nuclear Operations Group, Inc.
T. D. Bradley, *Secretary*, Savannah River Nuclear Solutions
C. R. Roache, *Secretary*, Westinghouse Electric Co.
R. Seipel, *Secretary*, Shine Medical Technologies
A. Appleton, Alloy Stainless Products Co., Inc.
A. R. Armstrong, U.S. Nuclear Regulatory Commission
W. Clover, Exelon Nuclear
A. C. Cole, The Hartford Steam Boiler Inspection and Insurance Co.
- J. N. Dailey**, Weller Energy Services Corp.
J. Gardiner, Curtiss-Wright, EMD
C. Kofi Klutse, Ghana Atomic Energy Commission
H. Malkhasyan, Worleyparsons Nuclear Services
L. E. Meche, Turner Industries Group, LLC
T. Shashaty, Dominion Energy
D. Vickery, Dubose National Energy Services, Inc.
H. S. O. Al Jaber, *Contributing Member*, ENEC
C. Castillo, *Contributing Member*, North Wind Portage
L. A. Yochim, *Contributing Member*, Black and Veatch

SUBCOMMITTEE ON SOFTWARE QUALITY ASSURANCE

C. Givens, *Chair*, Bechtel National, Inc.
B. Frank, *Vice Chair*, Westinghouse Electric Co.
Y. Deaton, *Secretary*, U.S. Department of Energy
L. Abbott, Savannah River Nuclear Solutions
S. B. Ailes, Atkins Global — Member of the SNC-Lavalin Group
K. Cook, Pacific Northwest National Laboratory
P. R. Diepolder, EMC, Inc.
G. S. Galletti, U.S. Nuclear Regulatory Commission
T. J. Hall, Ellis and Watts Global Industries
H. Henry, Battelle Energy Alliance, LLC
N. M. Kyle, Theseus Professional Services, LLC
G. A. Lipscomb, Goldwing Services
C. R. Martin, Longnecker and Associates
N. Moreau, Theseus Professional Services, LLC

A. R. Mrugacz, Sargent and Lundy, LLC
T. Muraki, Advanced Technology
D. Riggs, Riggs Quality Consulting
S. K. Sen, Retired
H. V. Sobah, Sobah Consulting
D. Sparkman, Sparkman and Associates, LLC
D. Taneja, U.S. Nuclear Regulatory Commission
G. Udentia, Consultant
P. L. Valdez, Palo Verde Generating Station
T. R. Verma, Consultant
R. W. VonRoble, VonRoble Consulting
R. Ward, Consolidated Nuclear Security, LLC
D. Williams, Consultant
M. Apodaca, *Contributing Member*, Sandia National Laboratories

SUBCOMMITTEE ON WASTE MANAGEMENT

M. F. Nicol, *Chair*, ARS Aleut Remediation, LLC
R. Wood, *Vice Chair*, Trinity Engineering Associates, Inc.
A. Sengupta, *Secretary*, U.S. Department of Transportation
B. Bice, Seafab Metals
M. L. Coriz, Los Alamos National Laboratory

M. Moore, Sandia National Laboratories
K. A. Morrell, SRNS/Aiken SC
J. Tapp, U.S. Nuclear Regulatory Commission
P. Yadav, U.S. Nuclear Regulatory Commission

INTERPRETATION SPECIAL WORKING GROUP (ISWG)

E. Renaud, *Chair*, Westinghouse Electric Co.
T. N. Rezk, *Secretary*, Bechtel Power Corp.

M. Concepcion-Robles, Dominion Energy Services, Inc.

SPECIAL WORKING GROUP ON HONORS AND AWARDS

J. E. Bergstrom, *Chair*, Bergstrom Consulting
J. Adkins, Consultant

J. M. Ziemba, Atkins Global — Member of the SNC-Lavalin Group

CORRESPONDENCE WITH THE NQA COMMITTEE

General. ASME Standards are developed and maintained with the intent to represent the consensus of concerned interests. As such, users of this Standard may interact with the Committee by requesting interpretations, proposing revisions, and attending Committee meetings. Correspondence should be addressed to:

Secretary, NQA Standards Committee
The American Society of Mechanical Engineers
Two Park Avenue
New York, NY 10016-5990
<http://go.asme.org/Inquiry>

Proposing Revisions. Revisions are made periodically to the Standard to incorporate changes that appear necessary or desirable, as demonstrated by the experience gained from the application of the Standard. Approved revisions will be published periodically.

The Committee welcomes proposals for revisions to this Standard. Such proposals should be as specific as possible, citing the paragraph number(s), the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent documentation.

Interpretations. Upon request, the NQA Standards Committee will render an interpretation of any requirement of the Standard. Interpretations can only be rendered in response to a written request sent to the Secretary of the NQA Standards Committee.

Requests for interpretation should preferably be submitted through the online Interpretation Submittal Form. The form is accessible at <http://go.asme.org/InterpretationRequest>. Upon submittal of the form, the Inquirer will receive an automatic e-mail confirming receipt.

If the Inquirer is unable to use the online form, he/she may mail the request to the Secretary of the NQA Standards Committee at the above address. The request for an interpretation should be clear and unambiguous. It is further recommended that the Inquirer submit his/her request in the following format:

- Subject: Cite the applicable paragraph number(s) and the topic of the inquiry in one or two words.
- Edition: Cite the applicable edition of the Standard for which the interpretation is being requested.
- Question: Phrase the question as a request for an interpretation of a specific requirement suitable for general understanding and use, not as a request for an approval of a proprietary design or situation. Please provide a condensed and precise question, composed in such a way that a “yes” or “no” reply is acceptable.
- Proposed Reply(ies): Provide a proposed reply(ies) in the form of “Yes” or “No,” with explanation as needed. If entering replies to more than one question, please number the questions and replies.
- Background Information: Provide the Committee with any background information that will assist the Committee in understanding the inquiry. The Inquirer may also include any plans or drawings that are necessary to explain the question; however, they should not contain proprietary names or information.

Requests that are not in the format described above may be rewritten in the appropriate format by the Committee prior to being answered, which may inadvertently change the intent of the original request.

Moreover, ASME does not act as a consultant for specific engineering problems or for the general application or understanding of the Standard requirements. If, based on the inquiry information submitted, it is the opinion of the Committee that the Inquirer should seek assistance, the inquiry will be returned with the recommendation that such assistance be obtained.

ASME procedures provide for reconsideration of any interpretation when or if additional information that might affect an interpretation is available. Further, persons aggrieved by an interpretation may appeal to the cognizant ASME Committee or Subcommittee. ASME does not “approve,” “certify,” “rate,” or “endorse” any item, construction, proprietary device, or activity.

Attending Committee Meetings. The NQA Standards Committee regularly holds meetings and/or telephone conferences that are open to the public. Persons wishing to attend any meeting and/or telephone conference should contact the Secretary of the NQA Standards Committee.

INTRODUCTION

This Standard is to be applied to any structure, system, component, activity, or organization that is essential to the safe, reliable, and efficient performance of a nuclear facility and any activities independent of a facility that may affect performance (e.g., transportation of nuclear materials) of those activities. The extent to which this Standard should be applied depends upon the specific type of facility, items, or services involved and the nature, scope, and relative importance of the activity being performed. It is also to be applied to all phases of a nuclear facility life cycle (e.g., siting, design, construction, operation, and decommissioning) and all types of activities (e.g., training, testing, software development or use).

The Standard also applies to activities that could affect the quality of nuclear material applications, structures, systems, and components of nuclear facilities.

Examples of nuclear facilities are those for power generation, spent fuel storage, waste management, fuel reprocessing, nuclear material processing, fuel fabrication, nuclear research, and other related facilities. Examples of activities include siting, designing, procuring, developing or using software, fabricating, constructing, handling, shipping, receiving, storing, cleaning, erecting, installing, inspecting, testing, operating, maintaining, repairing, refueling, modifying, and decommissioning.

This Standard is organized in the following four parts:

(a) **Part I** contains requirements for developing and implementing a Quality Assurance Program for nuclear facility applications.

(b) **Part II** contains additional quality assurance requirements for the planning and conduct of specific work activities under a Quality Assurance Program developed in accordance with **Part I**.

(c) **Part III** contains guidance for implementing the requirements of **Parts I** and **II**.

(d) **Part IV** contains guidance for application of ASME NQA-1 and comparisons of NQA-1 with other quality requirements.

The arrangement of the requirements in **Parts I** and **II** and the guidance in **Parts III** and **IV** permit the judicious application of the Standard or portions of the Standard. Applicable requirements of **Parts I** and **II** are to be implemented to ensure conformance with ASME NQA-1. The application of this Standard, or portions thereof, shall be invoked by written contracts, policies, procedures, specifications, or other appropriate documents.

This Standard reflects industry experience and current understanding of the quality assurance requirements necessary to achieve safe, reliable, and efficient utilization of nuclear energy and management and processing of radioactive materials. The Standard focuses on the achievement of results, emphasizes the role of the individual and line management in the achievement and sustainment of quality, and fosters the application of these requirements in a manner consistent with the relative importance of the item or activity (i.e., a “graded approach”).

ASME NQA-1-2022

SUMMARY OF CHANGES

Following approval by the ASME NQA Committee and ASME, and after public review, ASME NQA-1-2022 was approved by the American National Standards Institute on February 2, 2022.

ASME NQA-1-2022 includes the following changes identified by a margin note, **(22)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
1	Part I, Introduction	Sections 200 and 300 revised
14	Part I, Requirement 6	Sections 100 and 200 and para. 302 revised
34	Part II, Introduction	Sections 200 and 300 revised
72	Part II, Subpart 2.7, 102	Definition of <i>software tool</i> revised
75	Part II, Subpart 2.7, 302	Revised, and subparas. 302.1 and 302.2 added
98	Part II, Subpart 2.19, 100	Second paragraph revised
117	Part III, Subpart 3.1-1.1	Section 200 and para. 302 revised
118	Part III, Subpart 3.1-2.1	Sections 200, 300, 400, 600 and paras. 402, 501, and 502 revised
126	Part III, Subpart 3.1-2.4	Revised in its entirety
129	Part III, Subpart 3.1-2.5	Added
175	Part III, Subpart 3.1-18.3	Added
181	Part III, Subpart 3.2-2.7.1, 101.8	Added
181	Part III, Subpart 3.2-2.7.1, 102	Definitions of <i>reusable code</i> and <i>software library</i> added
183	Part III, Subpart 3.2-2.7.1, 300	Revised
223	Part III, Subpart 3.2-2.15	Revised in its entirety
230	Part IV, Subpart 4.1.1	(1) In title, reference to NQA-1 revised (2) In section 100, reference to NQA-1 revised and third paragraph added (3) In section 300, reference to NQA-1 revised
274	Part IV, Subpart 4.1.5, 100	Revised
276	Part IV, Subpart 4.1.5, Table 200-3	Recommendation (c) revised
277	Part IV, Subpart 4.1.5, Table 200-4	Recommendation (e) revised
282	Part IV, Subpart 4.1.5, Table 200-12	Recommendations (a), (b), and (c) revised
285	Part IV, Subpart 4.1.5, Table 200-19	Recommendation (b) revised
288	Part IV, Subpart 4.1.6	Added
310	Part IV, Subpart 4.2.5	(1) Paragraphs 200(b), 201, and 301 revised (2) In para. 301.1, first sentence revised (3) In para. 301.3, subparas. (d), (e), and (g) revised (4) In para. 301.4, subpara. (e) revised (5) In para. 301.5, first sentence revised (6) Paragraphs 301.6, 302, 303, 304, and 305 revised
323	Part IV, Subpart 4.2.8	Added
327	Part IV, Subpart 4.2.9	Added

PART I

REQUIREMENTS FOR QUALITY ASSURANCE PROGRAMS FOR NUCLEAR FACILITIES (FROM FORMER NQA-1)

INTRODUCTION

(22)

This Standard reflects industry experience and current understanding of the quality assurance requirements necessary to achieve safe, reliable, and efficient utilization of nuclear energy, and management and processing of radioactive materials. The Standard focuses on the achievement of results, emphasizes the role of the individual and line management in the achievement of quality, and fosters the application of these requirements in a manner consistent with the relative importance of the item or activity.

100 PURPOSE

Part I — this Part — establishes requirements for the development and implementation of a Quality Assurance Program (QAP) for nuclear facility applications. It is arranged by Requirements 1 through 18.

Part II contains additional quality assurance requirements for the planning and conduct of specific work activities under a Quality Assurance Program developed in accordance with **Part I**. It is arranged by Subparts.

Part III contains guidance for implementing the requirements of **Parts I** and **II**. It is arranged by Subparts.

Part IV contains guidance for the application of NQA-1 and comparisons of NQA-1 with other quality requirements. It is arranged by Subparts.

200 APPLICABILITY

Part I is applied using a graded approach to any structure, system, component, activity, or organization that is essential to the safe, reliable, and efficient performance of a nuclear facility and to any activities independent of a facility that may affect performance (e.g., transportation of nuclear materials) of those activities. It is also applied using a graded approach to all phases of a nuclear facility life cycle (e.g., siting, design, construction, operation, and decommissioning) and to all types of activities (e.g., training, testing, software development and use). A Quality Assurance Program developed in accordance

with **Part I** is applied when implementing **Part II** requirements.

300 RESPONSIBILITY

The user or implementing organization invoking this Standard shall determine and document applicable **Part I** Requirements and appropriately relate them to specific items, activities, and services. The organization implementing this Part and applicable **Part II** requirements as determined by scope of work, contract, legal, and regulatory requirements shall be responsible for complying with the specific requirements to achieve quality results in compliance with this Standard

400 TERMS AND DEFINITIONS

The following definitions are provided to assure a uniform understanding of select terms as they are used in this Standard:

acceptance criteria: specified limits placed on the performance, results, or other characteristics of an item, process, or service defined in codes, standards, or other requirement documents.

assessment: an all-inclusive term that may include review, evaluation, inspection, test, check, surveillance, or audit to determine and document whether items, processes, systems, or services meet specified requirements and perform effectively.

audit: a planned and documented activity performed to determine by investigation, examination, or evaluation of objective evidence the adequacy of and compliance with established procedures, instructions, drawings, and other applicable documents, and the effectiveness of implementation. An audit should not be confused with surveillance or inspection activities performed for the sole purpose of process control or product acceptance.