

ASME NQA-1-2024

(Revision of ASME NQA-1-2022)

Quality Assurance Requirements for Nuclear Facility Applications

AN AMERICAN NATIONAL STANDARD



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Mechanical Engineers**

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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-1-2024 was approved by ANSI as an American National Standard on June 13, 2024.

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	6/30/2022	...	...	...	...	...	...
15th Ed.	NQA-1-2024	7/24/2024	...	...	...	...	...	...

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.

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Nuclear Quality Assurance

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

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Revisions and Errata. The committee processes revisions to this Standard on a continuous basis 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 in the next edition of the Standard.

In addition, the committee may post errata on the committee web page. Errata become effective on the date posted. Users can register on the committee web page to receive e-mail notifications of posted errata.

This Standard is always open for comment, and the committee welcomes proposals for revisions. Such proposals should be as specific as possible, citing the paragraph number, the proposed wording, and a detailed description of the reasons for the proposal, including any pertinent background information and supporting documentation.

Cases. The committee does not issue cases for this Standard.

Interpretations. Upon request, the committee will issue an interpretation of any requirement of this Standard. An interpretation can be issued only in response to a request submitted through the online Inquiry Submittal Form at <https://go.asme.org/InterpretationRequest>. Upon submitting the form, the inquirer will receive an automatic e-mail confirming receipt.

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 information submitted, it is the opinion of the committee that the inquirer should seek assistance, the request will be returned with the recommendation that such assistance be obtained. Inquirers can track the status of their requests at <https://go.asme.org/Interpretations>.

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.

Interpretations are published in the ASME Interpretations Database at <https://go.asme.org/Interpretations> as they are issued.

Committee Meetings. The NQA Standards Committee regularly holds meetings that are open to the public. Persons wishing to attend any meeting should contact the secretary of the committee. Information on future committee meetings can be found on the committee web page at <https://go.asme.org/NQAcommittee>.

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-1-2024

SUMMARY OF CHANGES

Following approval by the ASME NQA Standards Committee and ASME, and after public review, ASME NQA-1-2024 was approved by the American National Standards Institute on June 13, 2024.

ASME NQA-1-2024 includes the following changes identified by a margin note, **(24)**.

<i>Page</i>	<i>Location</i>	<i>Change</i>
1	Part I, 400	(1) Definitions of <i>assure</i> and <i>ensure</i> added (2) Footnote (1) added, and subsequent footnotes renumbered
5	Part I, Requirement 1, 201	Subparagraph (d) revised
6	Part I, Requirement 2, 300	Revised
6	Part I, Requirement 2, 301	Revised
7	Part I, Requirement 2, 303.5	Subparagraph (c) revised
8	Part I, Requirement 2, 400	Revised in its entirety
12	Part I, Requirement 4, 100	Revised
12	Part I, Requirement 4, 200	Terms “Purchaser” and “Supplier” lowercased throughout
12	Part I, Requirement 4, 300	The term “Supplier” lowercased throughout
13	Part I, Requirement 5, 100	First sentence revised
18	Part I, Requirement 8, 100	Revised
18	Part I, Requirement 8, 200	Paragraphs 201 and 202 revised
19	Part I, Requirement 9, 100	Revised
19	Part I, Requirement 9, 200	Paragraphs 201 and 203 revised
19	Part I, Requirement 9, 300	Former para. 300 deleted, and former para. 400 revised and redesignated
20	Part I, Requirement 10, 500	Revised
20	Part I, Requirement 10, 700	Revised
20	Part I, Requirement 10, 800	Subparagraph (f) revised
22	Part I, Requirement 11, 100	Last sentence added
22	Part I, Requirement 11, 200	Subparagraph (a) revised
22	Part I, Requirement 11, 300	Title revised
22	Part I, Requirement 11, 400	Former section 400 deleted, and subsequent paragraphs redesignated
22	Part I, Requirement 11, 500	(1) Former para. 600 revised in its entirety (2) Former paras. 601 and 602 deleted
25	Part I, Requirement 13, 500	Revised
31	Part I, Requirement 18, 200	Second paragraph revised
31	Part I, Requirement 18, 201	Revised
31	Part I, Requirement 18, 301	Last sentence added
32	Part I, Requirement 18, 500	Subparagraph (c) revised
35	Part II, Subpart 2.1	Title revised
35	Part II, Subpart 2.1, 100	Revised

<i>Page</i>	<i>Location</i>	<i>Change</i>
35	Part II, Subpart 2.1, 101	In definition of <i>sensitized corrosion-resistant alloy</i> , ASTM specification updated
36	Part II, Subpart 2.1, 201	First paragraph revised
37	Part II, Subpart 2.1, 203	Second paragraph revised
37	Part II, Subpart 2.1, 204	Last sentence added
37	Part II, Subpart 2.1, 302.1	ASTM specifications updated
37	Part II, Subpart 2.1, 302.2	ASTM specifications updated throughout
38	Part II, Subpart 2.1, 302.4	(1) In subpara. (d), ASTM specification updated (2) Note revised
39	Part II, Subpart 2.1, Table 302.5	(1) Under “Rust,” entries for Classes B and C revised (2) Under “Flushing Criteria,” last entry corrected by errata (3) Note (3) added
40	Part II, Subpart 2.1, 400	First three paragraphs revised
44	Part II, Subpart 2.2, 201	Revised
47	Part II, Subpart 2.2, 304.1	Subparagraph (c) revised
48	Part II, Subpart 2.2, 306.3	Subparagraph (j) revised
50	Part II, Subpart 2.2, 309	Subparagraph (b)(3) revised
51	Part II, Subpart 2.2, 405	Revised
52	Part II, Subpart 2.2, 502.2	Subparagraph (b) revised
53	Part II, Subpart 2.2, 504	Revised
61	Part II, Subpart 2.5, 504	Subparagraph (f) revised
66	Part II, Subpart 2.5, 711	First paragraph revised
67	Part II, Subpart 2.5, 712	Revised
67	Part II, Subpart 2.5, 804	Fourth paragraph revised
68	Part II, Subpart 2.5, 804.1	Last paragraph revised
69	Part II, Subpart 2.5, 903	Revised
70	Part II, Subpart 2.7, 101	(1) Former paras. 101 and 102 transposed and cross-references updated throughout (2) Definition of <i>source code</i> added
72	Part II, Subpart 2.7, 203.1	Subparagraph (b)(3) added, and subsequent subparagraph redesignated
73	Part II, Subpart 2.7, 401	Revised
76	Part II, Subpart 2.7, 601	Second paragraph revised
76	Part II, Subpart 2.7, 700	Updated
88	Part II, Subpart 2.14, 900	Updated
96	Part II, Subpart 2.19, 201	(1) Subparagraph (a) revised (2) Subparagraphs (a)(3) and (b)(2) added, and subsequent subparagraphs redesignated
96	Part II, Subpart 2.19, 202	(1) Subparagraphs (a) and (a)(2) revised (2) Subparagraphs (a)(3) and (b)(2) added, and subsequent subparagraphs redesignated
99	Part II, Subpart 2.20, 300	Paragraphs 302 through 305 revised
107	Part II, Subpart 2.22, 500	Updated
119	Part III, Subpart 3.1-2.2, 100	Revised
120	Part III, Subpart 3.1-2.2, Figure 300	

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		Data in “Experience” and “Other Credentials of Professional Competence” boxes revised
122	Part III, Subpart 3.1-2.3, 100	Revised
122	Part III, Subpart 3.1-2.3, 300	Revised in its entirety
123	Part III, Subpart 3.1-2.3, 400	Subparagraph (a) revised
124	Part III, Subpart 3.1-2.4, 100	First paragraph revised
124	Part III, Subpart 3.1-2.4, 201	Revised
124	Part III, Subpart 3.1-2.4, 202	Titles of subparas. (a) through (c) revised
124	Part III, Subpart 3.1-2.4, 301	Last paragraph revised
125	Part III, Subpart 3.1-2.4, 302	Second and third paragraphs and subparas. (d) and (g) revised
125	Part III, Subpart 3.1-2.4, 401	First sentence and subparas. (f) and (g) revised
126	Part III, Subpart 3.1-2.4, 402	First sentence and subparas. (b) and (c) revised
127	Part III, Subpart 3.1-2.5, 101	Definitions of <i>HSS</i> and <i>LSS</i> revised
130	Part III, Subpart 3.1-2.5, 403.2	Second paragraph revised
132	Part III, Subpart 3.1-2.5, 602	Revised
132	Part III, Subpart 3.1-2.5, 700	Updated
134	Part III, Subpart 3.1-3.1, 300	Revised
136	Part III, Subpart 3.1-3.1, 401.2	Second paragraph deleted
136	Part III, Subpart 3.1-3.1, 401.3	Title revised
137	Part III, Subpart 3.1-3.1, 700	First sentence revised
138	Part III, Subpart 3.1-3.1, 1000	(1) Title revised (2) Updated
139	Part III, Subpart 3.1-4.1, 301	First paragraph and subparas. (c) and (h) revised
139	Part III, Subpart 3.1-4.1, 302	Subparagraph (d) revised
140	Part III, Subpart 3.1-4.1, 400	First sentence revised
144	Part III, Subpart 3.1-7.1, 100	Revised
145	Part III, Subpart 3.1-7.1, 700	Revised
145	Part III, Subpart 3.1-7.1, 701	Paragraph and subparagraph designations revised in their entirety
146	Part III, Subpart 3.1-7.1, 704	First sentence revised
158	Part III, Subpart 3.1-16.2, 800	Updated
168	Part III, Subpart 3.1-18.1, 200	Added, and subsequent paragraphs redesignated
168	Part III, Subpart 3.1-18.1, 303	In former para. 203, first paragraph revised
169	Part III, Subpart 3.1-18.1, 305	Former subpara. 205(e) revised
170	Part III, Subpart 3.1-18.1, 402.1	Former para. 302.1 revised
170	Part III, Subpart 3.1-18.1, 402.2	In former para. 302.2, first paragraph revised
170	Part III, Subpart 3.1-18.1, 402.5	In former para. 302.5, second paragraph revised
170	Part III, Subpart 3.1-18.1, 402.6	Former para. 302.6 revised
171	Part III, Subpart 3.1-18.1, 403	Former para. 303 revised
171	Part III, Subpart 3.1-18.1, 503.1	Former para. 403.1 revised
171	Part III, Subpart 3.1-18.1, 503.3	Added
172	Part III, Subpart 3.1-18.1, 504	Former para. 404 revised
172	Part III, Subpart 3.1-18.1, 600	Former para. 500 revised
172	Part III, Subpart 3.1-18.1, 800	In former para. 700, first paragraph revised, and subparas. (c) and (d) revised

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179	Part III, Subpart 3.2-2.1	Deleted
180	Part III, Subpart 3.2-2.7.1, 100	Text formerly in Introduction moved to section 100, and remainder of section 100 revised in its entirety
182	Part III, Subpart 3.2-2.7.1, 202	Revised
183	Part III, Subpart 3.2-2.7.1, 300	First paragraph revised
183	Part III, Subpart 3.2-2.7.1, 302	Revised
184	Part III, Subpart 3.2-2.7.1, 403	Subparagraph (a) revised
185	Part III, Subpart 3.2-2.7.1, 405.1.1	Revised
186	Part III, Subpart 3.2-2.7.1, 405.1.5	Revised
187	Part III, Subpart 3.2-2.7.1, 406.1	Paragraphs 406.1.1 and 406.1.2 and in-text table added
188	Part III, Subpart 3.2-2.7.1, 406.2	Former para. 406.3 revised and redesignated
188	Part III, Subpart 3.2-2.7.1, 406.3	Former para. 406.2 redesignated
189	Part III, Subpart 3.2-2.7.1, 601	Revised
189	Part III, Subpart 3.2-2.7.1, 700	Updated
190	Part III, Subpart 3.2-2.7.2	Title revised
190	Part III, Subpart 3.2-2.7.2, 100	Text formerly in Introduction moved to section 100, and remainder of paragraph revised
212	Part III, Subpart 3.2-2.14, 100	Revised in its entirety
216	Part III, Subpart 3.2-2.14, Table 501	In rows D-1, D-2, and D-9, “code” revised to “source code”
213	Part III, Subpart 3.2-2.14, 300	First paragraph revised
222	Part III, Subpart 3.2-2.14, 802	First paragraph revised
222	Part III, Subpart 3.2-2.14, 900	Updated
227	Part III, Subpart 3.2-2.20	Title revised
227	Part III, Subpart 3.2-2.20, 200	Revised
228	Part III, Subpart 3.3	Deleted
249	Part IV, Subpart 4.1.3	Title revised
249	Part IV, Subpart 4.1.3, 100	Revised
249	Part IV, Subpart 4.1.3, 300	Second and third paragraphs revised
301	Part IV, Subpart 4.2.1, 603.1	Cross-reference to Section 800 deleted by errata
309	Part IV, Subpart 4.2.4, 400	Subparagraph (h) revised
320	Part IV, Subpart 4.2.7, 200	Definition of <i>peer review plan</i> revised
321	Part IV, Subpart 4.2.7, 302.1	Second paragraph revised
322	Part IV, Subpart 4.2.7, 500	Revised
327	Part IV, Subpart 4.2.8, 600	Updated

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PART I

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

INTRODUCTION

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

(24)

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.

*assure*¹: to promise or state with certainty by one person or organization to another person or organization; to remove the doubt of an outcome. Contrast with *ensure*. For example, “The tester assures the designer that all tests have passed.”

¹ This definition has been adapted from IEEE Std 730-2014, IEEE Standard for Software Quality Assurance Processes, with the permission of IEEE.