ASME N626.3-1993

(REVISION OF ANSI/ASME N626.3-1988)

# **Qualifications and Duties** of Specialized Professional Engineers

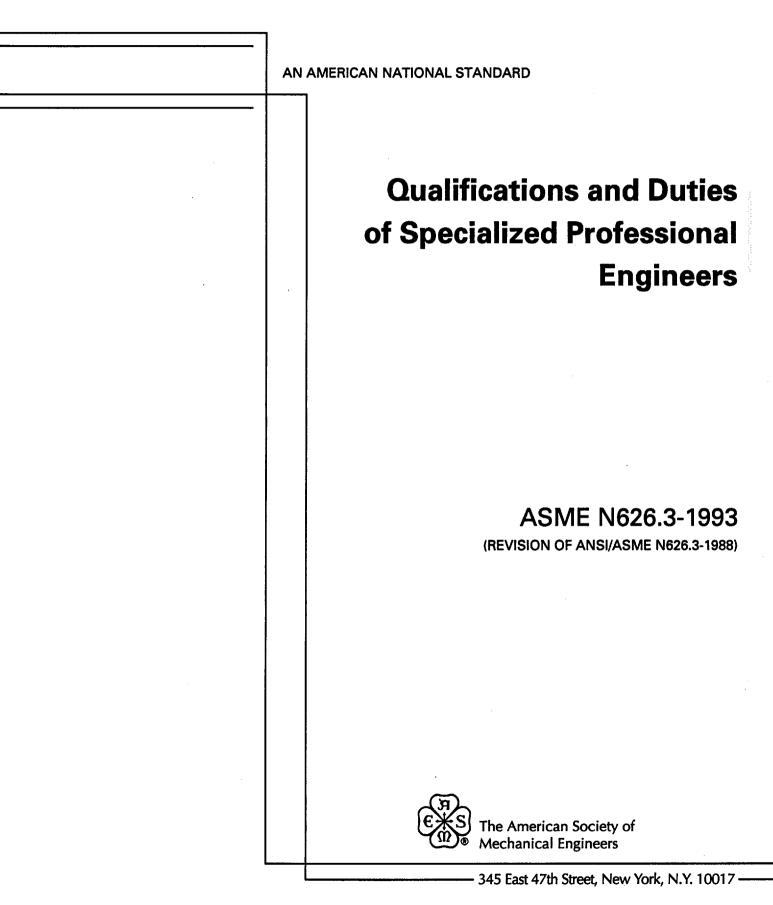
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The American Society of Mechanical Engineers



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#### FOREWORD

#### (This Foreword is not part of ASME N626.3-1993.)

At the March 29, 1973, meeting of the Policy Board, Codes and Standards, a Special Committee of the Policy Board, Codes and Standards, was established to develop a standard whose scope would include the duties and qualifications of the Authorized Inspection Agency, the supervisory personnel of the Authorized Inspection Agency, and the Authorized Nuclear Inspectors, as covered in the ASME Boiler and Pressure Vessel Code, Section III, Division I.

The Policy Board, Codes and Standards, at its meeting of September 27, 1973, designated the Special Committee as a Safety Code Committee and approved procedures for the Committee activities.

The scope of the Safety Code Committee was expanded by the Policy Board, Codes and Standards, to include the development of standards whose scope would include the duties and qualifications of the Authorized Inspection Agency, the supervisory personnel of the Authorized Inspection Agency, and the Authorized Nuclear Inspectors, as covered in the ASME Boiler and Pressure Vessel Code, Section XI, and Section III, Division 2, and the development of a standard for qualifications and duties of Specialized Professional Engineers.

To facilitate the development of such standards, Task Groups were appointed by the Safety Code Committee. The Safety Code Committee was made up of individuals associated with:

Nuclear Component Manufacturers

**Engineering Organizations** 

Utilities

State Regulatory Agencies

Nuclear Regulatory Commission (NRC)

Authorized Inspection Agencies

National Board of Boiler and Pressure Vessel Inspectors

ASME Boiler and Pressure Vessel Code

Joint ACI/ASME Committee on Concrete Nuclear Components

The Safety Code Committee, now designated Committee on Authorized Nuclear Inspection and Specialized Professional Engineers, reports to the ASME Board on Nuclear Codes and Standards. The Committee operates under procedures accepted by the American National Standards Institute as meeting the criteria of consensus procedures for American National Standards.

The first edition of this Standard was approved by the American National Standards Institute on May 2, 1978. Subsequent editions of the Standard were issued in 1979 and 1984.

Requests for interpretations, or suggestions for improvement of this American National Standard, should be addressed to the Secretary, ASME Committee on Authorized Nuclear Inspection and Specialized Professional Engineers, American Society of Mechanical Engineers, 345 East 47th Street, New York, NY 10017.

This edition incorporates all previous editions and addenda issued prior to December 1993, with no other changes.

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# COMMITTEE ON AUTHORIZED NUCLEAR INSPECTION AND SPECIALIZED PROFESSIONAL ENGINEERS

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

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## QUALIFICATIONS AND DUTIES OF SPECIALIZED PROFESSIONAL ENGINEERS

#### 1 SCOPE

This Standard presents minimum requirements for the qualification of personnel engaged in the certification and Design Report review activities of the ASME Code.<sup>1</sup> The personnel addressed are those who perform the following specialty fields:

(a) for Division 1:

(1) certification of the Design Specification on behalf of the Owner;

(2) certification of the Design Report on behalf of the N Certificate Holder;

(3) review of the Design Report on behalf of the Owner;

(4) certification of the Overpressure Protection Report on behalf of the Owner;

(5) certification of the Load Capacity Data Sheet on behalf of the N Certificate Holder.

(b) for Division 2:

(1) certification of the Design Specification on behalf of the Owner;

(2) certification of the Construction Specification, Design Drawings, and Design Report on behalf of the Designer;

(3) review of the Design Report on behalf of the Owner.

Also provided are the duties of these personnel in the performance of the activities described above.

#### **2 QUALIFICATIONS**

2.1 One or more registered Professional Engineers (PE) shall be selected by the Owner, Designer, or N Certificate Holder, as applicable, to perform Code activities in the appropriate specialized field(s), provided the qualifications of the PE in meeting the requirements of this Standard have been evaluated and verified by the Owner, Designer, or N Certificate Holder, as applicable, responsible for the activity being certified or reviewed. Guidelines for demonstrating PE qualifications are contained in Appendix C. A record of the qualifications of the PE shall be maintained by the responsible organization or the PE.

2.2 He shall be a registered Professional Engineer in at least one state of the United States or Province of Canada and have the following qualifications.

He shall have 4 years of varied application experience, at least 2 of which have been in each specialty field<sup>2</sup> for which he performs certifying or review activities as delineated in para. 2.3 through para. 2.6. In addition, he shall keep current his knowledge of Code requirements and continue his professional development in his specialty field through personal study and experience, or by attendance at appropriate courses, seminars, Society meetings, and technical committee meetings. The Owner, Designer, or N Certificate Holder, as applicable, shall review the qualifications of the PE at least once every 3 years to assure that his qualifications have been maintained. A continuing record of all such activity shall be included in the qualification records of the PE.

2.3 To qualify as certifier of the Design Specification on behalf of the Owner, the PE shall be experienced in the applicable field of design and related nuclear power plant requirements, and in the application of the requirements of the Code relating to the construction of nuclear power plant items.<sup>3</sup> This experience shall indicate that the PE has sufficient knowledge of anticipated plant and system operating and test conditions and their relationship to Code design criteria pertinent to the applicable Code item. In addition, he shall be knowledgeable of the specific Code requirements pertaining to his specialty field. Guidelines reflecting the degree of knowledge appropriate for preparation of the Design Specification are contained in Appendix B, Table B1.

<sup>&</sup>lt;sup>1</sup>ASME Code refers to the ASME Boiler and Pressure Vessel Code, Section III, Divisions 1 and 2, with Addenda and Code Cases.

 $<sup>^{2}</sup>$ This requirement for para. 2.3 and para. 2.5 may be fulfilled concurrently.

<sup>&</sup>lt;sup>3</sup>Items as used in this Standard are defined in Subsection NCA of the Code and include components, component and piping supports, appurtenances, core support structures, parts, piping subassemblies, and materials.

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2.4 To qualify as certifier of the Load Capacity Data Sheet, the Construction Specification, Design Drawings, or Design Report, the PE shall be experienced in the applicable field of design and analysis and in the application of the requirements of the Code. In addition, he shall be knowledgeable of the specific Code requirements pertaining to his specialty field. Guidelines reflecting the degree of knowledge appropriate for preparation of the Design Report (Division 1), the Load Capacity Data Sheet, and the Construction Specification, Design Drawings, and Design Report (Division 2) are contained in Appendix B, Tables B2, B4, and B5, respectively.

**2.5** To qualify as reviewer of the Design Report on behalf of the Owner, the PE shall fulfill the experience and knowledge requirements of para. 2.3.

2.6 To qualify as certifier of the Overpressure Protection Report on behalf of the Owner, the PE shall be experienced in nuclear power plant systems design, and in plant operation and safety control. In addition, he shall be knowledgeable of the specific Code requirements pertaining to his specialty field. Guidelines reflecting the degree of knowledge appropriate for preparation of the Report on Overpressure Protection are contained in Appendix B, Table B3.

#### **3 DUTIES**

**3.1** The certification and review activities covered in this Standard may be performed only if the PE has assured himself that he is qualified to do so by virtue of a self-review establishing that his qualifications meet those required by this Standard. He shall be familiar with the Quality Assurance requirements of the organization responsible for providing the document as these requirements relate to his work. For certification activities, the document being certified must have been reviewed in detail by the certifying PE, or prepared by him or prepared under his responsible direction. He shall prepare a statement<sup>4</sup> to be affixed to the document attesting to compliance with the applicable requirements of the Code.

**3.2** It is the responsibility of the PE certifying the Owner's Design Specification to assure that the Design Specification is correct, complete, and in compliance with the requirements of the applicable Edition and Addenda of the Code. As a minimum, the certifier of the Design Specification shall assure that:

(a) the function of the item is properly specified;

(b) the design requirements, including identification of the item Design and Service Loadings and their combinations and associated Limits, are properly specified;

(c) the proper environmental conditions, including corrosion, erosion, and radiation, are specified;

(d) the Code classification is properly specified;

(e) the definition of the specific boundaries and load conditions on these boundaries for each item is specified, and that the boundaries and associated load conditions between adjacent components and structure are compatible with the overall system design;

(f) the specified materials for items covered by the Code are permitted by the Code for the applicable item;

(g) all requirements with regard to impact testing are specified;

(h) any restrictions on or additional requirements for heat treating are specified;

(i) any restrictions on cladding materials are specified;

(j) any reduction to design stress intensity values, allowable stress, or fatigue curves necessitated by the given environmental conditions are specified;

(k) the necessary information concerning the load carrying capacity of structures supporting Code items is given in the Design Specification;

(1) when operability of a component is a requirement, the Design Specification shall make reference to other appropriate documents that specify the operating requirements;

(m) the overpressure protection requirements are specified;

(n) the Code Edition, Addenda, and Code Cases to be used for construction are specified.

**3.3** It is the responsibility of the PE certifying the Division 1 Design Report to assure that the design of the item complies with the requirements of the applicable Edition and Addenda of the Code for the Design, Service, and Test Loadings that have been specified in the Design Specification. As a minimum, the certifier of the Design Report shall assure that:

(a) the Design Report reflects the design as shown by the drawings used for construction and that all modifications to the drawings and construction deviations have been reconciled with the Design Report;

(b) the design as shown by the drawings is in accordance with the requirements of the Code;

(c) the Design Report is in accordance with the requirements of the Code;

(d) materials specified for Code items are permitted by the Code, and that any reduction of material

<sup>&</sup>lt;sup>4</sup>Illustrative samples of statements are shown in Appendix A.

impact properties from heat treatments, welding, and forming have been taken into account;

(e) the Design Report is based on the Design, Service, and Test Loadings stated in the Design Specification;

(f) the specified requirements for protection against nonductile fracture are specified;

(g) all special nondestructive examinations required to validate unique features have been specified in appropriate documents/drawings;

(h) the specified test pressure and temperature are in compliance with Code requirements;

(i) adequate analytical techniques have been employed to assess the structural adequacy of the item of concern for the Design, Service, and Test Loadings specified.

**3.4** It is the responsibility of the PE reviewing the Design Report on behalf of the Owner to review such report to the extent necessary to determine that it is based on the Design, Service, and Test Loadings stated in the Design Specification. The reviewing engineer shall be other than the one preparing the Design Report.

**3.5** It is the responsibility of the PE certifying the Overpressure Protection Report to assure that the report has been reconciled with the system requirements and with the requirements of the applicable Subsection of the Code.

**3.6** It is the responsibility of the PE certifying the Load Capacity Data Sheet on behalf of the N Certificate Holder to determine that the load capacity of the component or piping support is rated in accordance with Subsection NF of the Code. He shall assure that the design of the component or piping support complies with the requirements of the applicable Edition and Addenda of the Code for the Design, Service, and Test Loadings specified in the Design Specification. In addition, his duties shall include the requirements of para. 3.3(a) through para. 3.3(i) for the data substantiating the Load Capacity Data Sheet.

**3.7** It is the responsibility of the PE certifying the Construction Specification, Design Drawings, or Design Report on behalf of the Designer for Division 2 to assure that each of the above principal Code documents is correct, complete, and in accordance with the Design Specification and Section III, Division 2. As a minimum, the certifier of each of the principal Code documents shall assure:

(a) that the Design Drawings contain:

(1) concrete and steel liner thicknesses;

(2) size and location of reinforcing steel, prestressing tendons, and penetrations;

(3) the latest revisions to reflect any change in design.

(b) that the Design Report includes the requirements of para. 3.3(a) through para. 3.3(i), as applicable.

(c) that the Construction Specification has provided the following in accordance with the Code:

(1) material specifications;

(2) material shipping, handling, and storage requirements;

(3) requirements for personnel or equipment qualification;

(4) material or part examination and testing requirements;

(5) acceptance and leakage testing requirements;

(6) requirements for shop drawings;

(7) requirements for batching, mixing, placing, and curing of concrete;

(8) requirements for the fabrication and installation of the prestressing system, reinforcing steel, and embedments;

(9) identification of parts requiring a Code stamp;

(10) design life for parts and materials where necessary to establish compliance with the Design Specification;

(11) construction surveillance to be performed by the Designer as required by the Design Specification;

(12) the latest revisions to reflect any change in design.

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# APPENDIX A – NONMANDATORY SAMPLE STATEMENTS

A1 DESIGN SPECIFICATION

#### CERTIFICATION

I, the undersigned, being a registered Professional Engineer competent in the applicable field of design and related nuclear power plant requirements relative to this Design Specification, certify that to the best of my knowledge and belief it is correct and complete with respect to the Design and Service Conditions given and provides a complete basis for construction in accordance with NCA-3250 and other applicable requirements of the ASME Boiler and Pressure Vessel Code, Section III, Division \_\_\_\_\_, \_\_\_\_ Edition with Addenda up to and including

The Specification and Revision being certified is:

	Certified by		P.E.
Registration No.		_ State •	· · · · · · · · · · · · · · · · · · ·
	Date		

\*or Province of Canada

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#### **A2 DESIGN REPORT**

#### **CERTIFICATION**<sup>1</sup>

I, the undersigned, being a registered Professional Engineer competent in the applicable field of design and using the certified Design Specification and the drawings identified below as a basis for design, do hereby certify that to the best of my knowledge and belief the Design Report is complete and accurate and complies with the design requirements of the ASME Boiler and Pressure Vessel Code, Section III, Division \_\_\_\_\_, \_\_\_\_ Edition with Addenda up to and including \_\_\_\_\_.

**Design Specification and Revision:** 

Drawings and Revision:

	Certified by			 P.E.
Registration No.			State*	 
	[	Date		 

<sup>1</sup>Similar statement may also be used for certification of Load Capacity Data Sheet when supplied in lieu of Design Report (NCA-3551).

\*or Province of Canada

#### A3 OWNER'S REVIEW OF DESIGN REPORT

## SAMPLE STATEMENT<sup>2</sup>

This Design Report has been reviewed by the undersigned in accordance with NCA-3260(a) of the ASME Boiler and Pressure Vessel Code, Section III, Division \_\_\_\_\_, \_\_\_\_ Edition with Addenda up to and including \_\_\_\_\_\_, and to the best of the reviewer's knowledge and belief is based upon the Design, Service, and Test Loadings stated in the Design Specification.

**Design Specification and Revision:** 

Design Report and Revision:

Owner:

**Reviewer and Affiliation:** 

<sup>&</sup>lt;sup>2</sup>Similar statement may also be used for review of Load Capacity Data Sheet when supplied in lieu of Design Report (NCA-3551).

#### A4 OVERPRESSURE PROTECTION REPORT

#### CERTIFICATION

I, the undersigned, being a registered Professional Engineer competent in the applicable field of design and overpressure protection requirements, do hereby certify that to the best of my knowledge and belief the Overpressure Protection Report complies with the requirements of the ASME Boiler and Pressure Vessel Code, Section III, Division \_\_\_\_\_, \_\_\_\_ Edition with Addenda up to and including \_\_\_\_\_\_.

**Overpressure Protection Report and Revision:** 

**Design Specification and Revision:** 

	Certified by			 P.E.
Registration No.			State*	 
	0	Date		

\*or Province of Canada

# APPENDIX B – NONMANDATORY GUIDELINES FOR ESTABLISHING ASME CODE KNOWLEDGE

This Appendix provides guidelines for establishing the degree of Code knowledge required by the certifying and reviewing PE in his specialty field. In the paragraphs that follow, the degree of knowledge required by the PE of the requirements of the Code pertaining to his specialty field is indicated by the terminology "general knowledge" and "working knowledge."

As used in this Appendix, "general knowledge" signifies having sufficient acquaintance with the Code to be conversant with other persons involved in its applications, and to make prudent judgements in the application of Code requirements.

As used in this Appendix, "working knowledge" signifies understanding by prior customary involvement in a specialty field of the Code requirements and of the principles on which the Code rules are based, to the extent that the PE may apply or direct others in the application of the requirements. In this sense, "working knowledge" implies a more thorough understanding of the Code requirements and the ability to apply them than does "general knowledge" of the Code.

The degree of knowledge in the various areas of the Code cited in Tables B1 through B5 is based upon the more common Code items and activities. There may be special items or activities for which the degree of knowledge in a specific Code area must be more detailed than shown in the applicable table, or may require knowledge of specific Code areas that are not cited.

In the following tables, the degree of knowledge required by the PE of the various requirements of the Code pertinent to his specialty field is indicated by the letter G for "general knowledge" and the letter W for "working knowledge."

# TABLE B1DESIGN SPECIFICATION ANDDESIGN REPORT REVIEWDIVISIONS 1 AND 2

#### (W = Working Knowledge; G = General Knowledge)

	Knowie	age)	
NCA-1000	w	NX-3700	G*
2000	W	3800	G*
3100	W	3900	G*
3200	W	4100	G
3300	W*	4210	G
3400	W*	4220	G
3500	W*	4240	G
3600	W	4620	G
3700	G	5100	G
3800	G	5200	G
3900	G*	6000	W*
4000	G		
5000	G	NF/NG-1000	W*
8000	G	2100	G*
		2300	G*
NX-1000	W	3000	G*
2100	G	4100	G*
2300	G	4200	G*
2500	G	5000	G*
2600	G		
3100	G	CB/CC-1000	W
3200	G	2000	G
3300	G*	3000	G
3400	G*	4000	G
3500	G*	5000	G
3600	G*	6000	G

#### TABLE B2 DESIGN REPORT - DIVISION 1

(W = Working Knowledge; G = General Knowledge)						
NCA-1000	G	NX-3400	W*			
2000	G	3500	W*			
3100	w	3600	W*			
3200	G	3700	W*			
3300	W*	3800	W*			
3400	W*	3900	W*			
3500	W*	4100	G			
3600	G	4210	G			
3700	G	4220	G			
3800	G	4240	G			
3900	G	4620	G			
4000	G	5100	G			
8000	G	5200	G			
		6000	W			

NF/NG-1000 W\*

2100 W\*

2300 W\*

3000 W\*

4100 G\*

4200 G\*

5000 G\*

NX = NB/NC/ND/NE, as applicable

NX-1000 W 2100 W

2300 W

2500 W\*

2600 G

3100 W

3200 W\*

3300 W\*

\* = as applicable

NX = NB/NC/ND/NE, as applicable

• = as applicable

#### TABLE B3 OVERPRESSURE PROTECTION REPORT – DIVISIONS 1 AND 2

#### (W = Working Knowledge; G = General Knowledge)

NCA-1000	G	NX-3521	G
2000	w	3621	G
3100	G	6200	G
3200	G	6300	G
3500	G	7000	W
3600	G		
4000	G	CB-1000	G
		3100	G
NX-1000	G	3200	W
3110	W	6100	G
3220	G	6211	G
3230	G	7000	W
3414	G		

NX = NB/NC/ND/NE, as applicable

# TABLE B4 LOAD CAPACITY DATA SHEET -- DIVISION 1

#### (W = Working Knowledge; G = General Knowledge)

		-	
NCA All	G	NF-3500	W*
NCA-1250	W	3600	W*
2140	W		
3550	W	Appendix	
		I.	G
NF All	G	Ш	G*
NF-3100	W	II-1220	W*
3200	W	II-1430	W*
3300	W*	F	G*
3400	W	F-1321	W*
		F-1370	W*

• = as applicable

#### TABLE B5 CONSTRUCTION SPECIFICATION, DESIGN DRAWINGS, AND DESIGN REPORT – DIVISION 2

	Construction Specification	Design Drawings	Design Report		Construction Specification	Design Drawings	Design Report
NCA-1000	w	W	w	CB/CC-1000	w	w	w
2000	w	w	w	2000	W	G	w
3100	W	w	w	3100	w	w	w
3200	w	w	w	3200	G	G	w
3300	w	w	w	3300	G	W	w
3400	W	w	w	3400	G	W	w
3500	G	G	G	3500	w	W	w
3600	G	G	G	3600	W	W	w
3700	G	G	G	3700	W	w	w
3800	w	G	G	3800	W	W	w
3900	w	G	G	4100	w	w	w
4000	w	G	w	4200	W	w	G
5000	G	G	G	4300	w	w	G
8000	G	G	G	4400	W	w	G
				4500	w	W	G
				5000	W	w	w
				6000	W	G	G
				7000	W	G	G
				8000	W	G	G

# (W = Working Knowledge; G = General Knowledge)

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# APPENDIX C – NONMANDATORY GUIDELINES FOR DEMONSTRATING PE QUALIFICATIONS

This Appendix provides suggested methods for demonstrating that the requirements for the qualification of personnel engaged in the certification and Design Report review activities of the ASME Code, Section III, as required by Section 2 of this Standard have been met. The Owner, Designer, or N Certificate Holder, as applicable, responsible for the activity being certified or reviewed should establish procedures or instructions for evaluating, verifying, and documenting the qualifications of the PE engaged in certifying or review activities as required by this Standard.

**C1** The PE's qualifications for the requirements of para. 2.2 may be demonstrated as follows.

(a) PE registration in one or more states of the United States or provinces of Canada should be documented on records that, as a minimum, include:

- (1) PE's identification
- (2) state or province of registration
- (3) registration number
- (4) expiration date

(b) The 4 years of varied application experience, including 2 years in his specialty field(s), should be documented in a resume describing the PE's Code experience and places and dates of employment.

(c) In order for the PE to keep current his knowledge of the Code requirements and to continue his professional development in his specialty field(s), as required by this Standard, he should, in the 36-month period preceding the date of qualification, have performed Code activities requiring certification in his specialty field(s), or have been engaged in the application of Code requirements to an equivalent extent, but not necessarily including Certification. Alternatively, he should have done two or more of the following:

(1) taught or attended an appropriate course or training program;

(2) taught or attended an appropriate seminar;

(3) attended an ASME or ASME/ACI Code meeting;

(4) attended a technical society meeting related to his specialty field.

(d) The PE's participation in these activities should be documented in appropriate records that, as a minimum, include:

(1) PE's identification

(2) description of Code activities performed

(3) course or training program description, duration, and date completed

(4) seminar description, duration, and date attended

(5) ASME or ASME/ACI Code meeting(s) and date(s) attended

(6) technical society meeting(s) and date(s) attended

(7) the PE's function (i.e., attendee, member, speaker, chairman, etc.) indicating the nature of his participation.

**C2** Appendix B provides guidance regarding knowledge of the Code that the PE should have in each specialty field. The PE's qualifications regarding knowledge of the Code as required by this Standard may be demonstrated by any one of the following methods.

(a) The Owner, Designer, or N-Certificate Holder, as applicable, upon review of the experience record of the PE, declares in writing that (1) the PE's knowledge of the Code in his specialty field meets the requirements of the Standard, and (2) the PE's experience record reflects successful performance of the applicable Code activities in connection with the construction of ASME Code items.

(b) Another PE previously qualified to ASME N626.3, designated by the Owner, Designer, or N-Certificate Holder, as applicable, and familiar with the requirements of this Standard and the Code, after reviewing the qualifications of the PE to be qualified, attests in writing that the PE's knowledge of the Code in his specialty field(s) meets the requirements of this Standard.

(c) Attendance of the PE at appropriate courses or seminars that provide instruction in the Code for his specialty field(s) to impart knowledge of the Code required by this Standard. Training should be scheduled as required by this Standard. Training should be scheduled at a frequency consistent with significant changes to the Code in his specialty field(s). Training may be accomplished by attending in-house courses or courses presented by others. Training should be documented on appropriate records that, as a minimum, include:

(1) attendee's identification

- (2) instructor's name and affiliation
- (3) outline or description of course or seminar

(4) date and duration of course or seminar

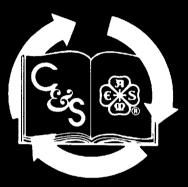
(d) Examination of the PE in his specialty field(s), either written or oral, to verify his knowledge of the Code as required by this Standard. The examination may be developed and/or administered either inhouse or by others. Examinations should be documented on appropriate records that, as a minimum, include:

(1) attendee's identification

(2) examiner's name and affiliation

(3) outline or description of examination

(4) date and results of the examination



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